

*Second
Edition*

Geography

Teacher's Guide



Kells
EDUCATION

Geography

Teacher's Guide



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EDUCATION

Geography, Teacher's Guide Second Edition



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Esfuerzo 18-A
Colonia Industrial Atoto
Naucalpan de Juárez Estado de México, C.P. 53519

ISBN: 978-607-10-0949-4 Second Edition 2016
(ISBN: 978-607-10-0651-6 First Edition 2014)

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Second Edition 2016

First Edition 2014

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Printed in Mexico

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To the Teacher

Dear teacher,

As you know, Geography is a science that includes the study of the weather, topography, natural regions, economic production and political organization of different regions and countries in the world. This book will encourage you to explain how these elements interrelate to constitute and integrate geographic space.

In this book there is a glossary that provides with new words to help students better understand the topics. There are also activities, projects and curious facts that will help students expand their interest and knowledge. The skills you teach will help them understand the ever changing world and their place in it. We are sure they will enjoy the challenge. And we are certain that this book will help you lead the way in the exploration of Geography!

The author

Unit 1 provides a specific perspective of the geographic space, which begins with its conceptualization and category analysis, and ends with the importance of geographic information and the various cartographic representations of space.

Unit 2 offers information related to the seismic regions in the world and volcanism. It moves on to the location of the earth's tectonic plates. At the end, the focus is on the structure of earth's continental and oceanic topography.

Unit 3 describes the population dynamics in the world, as well as its composition, growth and distribution. Then, it analyzes the contrast between the different economic sectors of the countries in the world, including Mexico. The unit ends with an analysis of the social, cultural, economic and political causes and consequences of migration.

Unit 4 covers topics related to how natural resources are used in each country, the importance of mineral and energy resources and their distribution in the world and their economic and industrial impact. Finally, the focus is on how these resources help to improve the human and economic development in the world.

Unit 5 analyzes the environmental impact and its relationship with natural phenomena and how to prevent risks. The unit continues with the situations that influence the quality of life of people in the world, and the actions countries are taking with clean technologies to deal with global warming.

How to use this book

Session Information: In this section, you will see the course pacing, week and session. Consider each session is fifty minutes long to cover a 40 week course and there is also the expected learning outcome per session.

Content Delivery: In this section, you will see recommendations to deliver information in class.

SESSION INFORMATION

Week: 1

Session: 3

Expected learning outcome: Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

CONTENT DELIVERY

Start: Students should identify the natural, social and economic components of the geographical space shown in the picture. Elicit answers in whole class.

Development: Students will read the rest of the information on the page. Have them reflect upon their own area, ask them questions to help them analyze the place where they live.

Closing: Students should describe their area in an essay answering the question: How is my local area? Remind students of the writing process: Pre-writing, drafting, revising, editing, proofreading, and publishing.

Homework for the teacher: Prepare three pictures of the same place in different time (in the beginning, the middle and the end of the XX century, for instance).

10

Project

Natural, Social, Cultural, Economic and Political Components of the Geographical Space

Elements of geographical space can be classified in three main groups:

1. **Natural components** are those relating to nature, among which can be found those of a physical nature such as topography, climate, water, soil and subsoil, and those of a biological nature like flora and fauna.
2. **Social components** point out the specific characteristics of a population such as **absolute population** and **relative population or population density**.

density is relationship to the environment and the transformation of geographical space, cultural traits, language, religion, historic evolution and political structure.

3. **Economic components** are represented by all the activities done by groups through the exploitation and use of natural resources. For example: fishing, agriculture, livestock, hunting, industry, transportation, trade, tourism and finance.

Apply your knowledge



Fig. 1.1 Fishermen of Guernsey.

Identify the characteristics of geographical space

Look at the picture and identify the natural, social and/or economic components of geographical space. Write the information in your notebook.

- Identify the natural, social and/or economic components of geographical space.

Diversity of Geographical Space

Look around you. Notice the wide diversity of elements that you see. You will find both physical and man-made elements. The physical environment provides resources, landscapes or natural scenarios where various activities can be carried out, whether they are economic, political or cultural.

The intersection between these various factors shape geographical space: forms, environments, social construction and economic organization. Geographical space is dynamic and temporary because its construction and transformation are continuous throughout time.

10

SKILLS DEVELOPMENT

Critical thinking skills: Observing.

Naturalist skills: Observing details.

Writing skills: Writing process.

EVALUATION OF CONTENT

Check students' essays.

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Skills Development: This is the list of strategies you will be using in the session.

Evaluation of Content: This is the description of how you should evaluate learning outcomes.

Rubrics: Clear criteria to evaluate students' performance in Geography.

Projects Rubrics			
Aspect	Beginner	In process	Expert
Theoretical framework	The introduction is weak or there are major inaccurate aspects.	The introduction does not fit with the rest of the project or there are minor inaccurate aspects.	The introduction provides with accurate and relevant information.
Project evidence	The project has inaccurate data. It is irrelevant or repetitive and it contains questionable evidence.	The project has minor errors or it is not very elaborated.	The project is clearly explained.
Project design and performance	The variables are not controlled. The study object is not focused. There's a lack of data.	Some variables are controlled. The study object is focused. The data has mistakes.	The variables are under control. The study object is clearly focused. There are few data mistakes.
Conclusion	There is not a conclusion or it is not sustained.	There is a conclusion, but it is weakly sustained.	The conclusion is well sustained.
References	The reference list contains one or two sources but the references are incomplete.	The reference list contains three sources with complete references.	The reference list contains four or more sources with complete references.
Language use	The project is not very clear; it lacks organization, coherency or appropriate grammar use.	The project is clear, with a few flaws on organization, coherency or appropriate grammar use.	The project is coherently described and clearly stated with few grammar and spelling mistakes.
Collaborative work	Not all the members of the team presented or participated.	Some of the members of the team participated.	All the members of the team presented or participated.

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Attendance and Evaluation List: These formats will help you keep track of the evaluation procedure specially designed for the content of this book.

Geography																																							
Attendance and Evaluation List																																							
School _____											School year _____											Teacher _____																	
Student's name	Unit attendance																														Sequences grades								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32							

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Resources list	
Student book page	Resources
Unit 1	
19	A map of Mexico, a map of America and a world map and a ruler the following class.
21	A map that has longitude and latitude divisions.
25	A world map.
26	A world map without political division or names, a world map with time zones, ruler, and pencil.
28	A device with Internet access.
32	In teams: A photo of a topographic map or chart from INEGI from any area in Mexico, vellum paper or any other paper that is semitransparent, a device with Internet access.
Unit 2	
39	A world map and an atlas.
40	A world map.
41	A piece of cardboard, markers, ruler.
45	A bar of plasticine or modeling clay, a piece of wood.
47	A map of Mexico, modeling clay (or plasticine) and a piece of wood.
51	A map of Mexico with hydrography.
52	A world map and a map of Mexico with names.
54	A sky lantern.
55	A piece of cardboard, markers.

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Resources List: A brief summary on what students need to take to class.

Geography
Unit 1 Assessment

Date: _____
Name: _____

ANSWER THE FOLLOWING QUESTIONS.

1. Where did Charles Darwin explore for five years?
2. What components is geographical space made of?
3. What are the two types of natural components and what does each of them include?
4. What are the categories of Spatial Analysis?
5. Exemplify each of the spatial analysis categories.
6. Mention the three scales that a cartographic representation refers to.
7. What is a scale in a map?
8. Which are the two scales used in a map?
9. What are scales used for?
10. What are the names of the Earth?

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Summative Assessment: Unit evaluation instruments with answer key.

Geography
Unit 1 Assessment Answer Key

Students are expected to give in their own words the following information:

1. It is traceable because coordinates are given to identify it, it is differentiated because no exact duplicate exists and is changeable because the human race transforms it.
2. The components of geographical space are natural, social, cultural, and economic and politic ones.
3. Biological components include living creatures, like plants and animals, physical components include unarranged elements such as rivers, mountains, and weather.
4. Place, landscape, region and territory.
5. Place, plaza, Geographic space rural, Landscape desert, Region, Sahara Desert, Territory, Egypt.
6. Local, National, Global, Regional.
7. It is the relation between the real dimensions of the surface that is being represented and its proportion on the map.
8. Numerical and Geographical.
9. They are used to calculate other scales or distances within a map.
10. Imaginary lines; the main ones are meridians and parallels.
11. Latitude is the distance that exists between any point on Earth's surface and the equator (0°). Longitude is the distance that exists between any point on the surface of the Earth and the Greenwich Meridian. Altitude is the distance between a point on the Earth's surface, and sea level.
12. Height is calculated according to the geographical element up to its summit; altitude is measured according to sea level.
13. Time Zones are a universal and standardized system for time use.
14. A Map Projection is the process that the cartographer follows to trace a map according to specific needs.
15. Cylindrical, Conic and Azimuthal projections.
16. Mercator brought to the world a projection of a unique map where every projected straight line is loxodromic, which makes the direction accurate and real. In Ptolemy's projection, meridians appear as parallel, vertical lines and the distance between parallels shortens as it approaches to the poles, thus allowing following exact paths on a projection with the help of a compass. Robinson developed a pseudo-cylindrical projection, where the central parallel, usually the Equator and a Central Meridian, cross in a right angle in the center of the map. At this intersection, the projection does not have any distortion. However, the distortion increases as we approach the edge of the map.
17. Aerial photography is an essential tool in cartography. These photographs allow the development of reliable and precise maps of vegetation coverage, urban growth, the evaluation of natural disasters, as well as to trace roadways.
18. Geographical space can be differentiated based on its specific coordinates.

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Student book U1

SESSION INFORMATION

Week: 1

Session: 1

Expected learning outcome:

Identify the content of the unit.

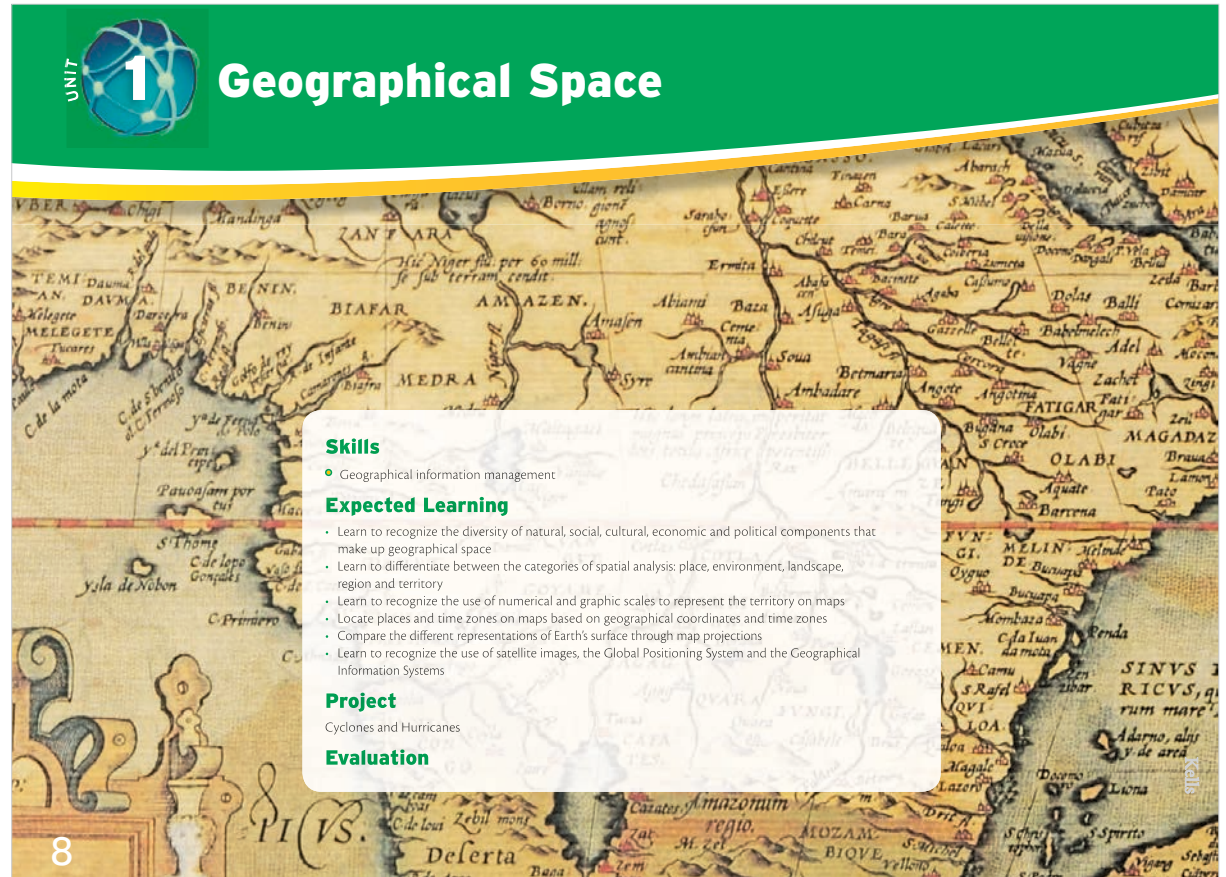
CONTENT DELIVERY

Start: The teacher should introduce himself, the subject, the class schedule, and the grading criteria.

Development: Students should read the expected learning outcomes. Check how familiar they are with the topics in order to activate prior knowledge and identify how clear the information is for your students.

Closing: Students should identify the topics in the unit they consider will be hard to understand. Then, they should decide how they will study such topics and write a study plan.

Homework: Students should get a map and an atlas for the following class.



UNIT 1 Geographical Space

Skills

- Geographical information management

Expected Learning

- Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space
- Learn to differentiate between the categories of spatial analysis: place, environment, landscape, region and territory
- Learn to recognize the use of numerical and graphic scales to represent the territory on maps
- Locate places and time zones on maps based on geographical coordinates and time zones
- Compare the different representations of Earth's surface through map projections
- Learn to recognize the use of satellite images, the Global Positioning System and the Geographical Information Systems

Project

Cyclones and Hurricanes

Evaluation

8

SKILLS DEVELOPMENT

Metacognitive skills: Defining a study plan.

EVALUATION OF CONTENT

Check students' study plan.

Characteristics of Geographical Space

How much do you know?

Discuss the following questions with your classmates:

- What are the characteristics of the place where you live?
- Do you think it looks like any other neighborhood or city of the world? Why?
- What elements do consider exclusive to your neighborhood or city?
- With the information you have, how important do you think it is to study geography?

Once you have answered the previous questions, continue with the following activity:

- Locate your city on a map of your country. You must include: title, coordinates and orientation (use an Atlas).

We all live in places with specific spatial characteristics.

All the places in the world have different characteristics, and there is always a certain component that distinguishes one from another (Fig. 1.1).

Their study and knowledge corresponds to geography which is an **interdisciplinary** science, that on the one hand deals with its own concepts, goals and methodology, and on the other is aided by other sciences such as hydrology, oceanography, geology, meteorology or biology, along with social sciences like demography, anthropology, sociology, economics, history, etc.

Geography is one of the most important disciplines due to the natural and social elements it comprises. Many of the events that come up on a daily basis in Mexico, the world, our community, and everything that surrounds us, can be explained by geography. In the last few decades, new approaches have emerged that analyze the problems populations face from a social perspective.

Geography is also considered a science that studies the social construction of space. Currently, the concept of **geographical space** is the one mostly used in defining its main object of study.

The categories of analysis of geographical space are place, landscape, region and territory, as well as spaces made by humans.

The components that make up geographical space are natural, social and economic elements from which others derive (Fig. 1.2).

Geography is based on:

Positioning the specific location of a given area through the use of coordinates.

Short-term nature and change implies the series of transformations that have occurred through time.

Distribution refers to the positioning of spaces with similar natural, social and economic characteristics and components.

Relationship and interaction establishes how geographical space components are linked to each other and their degree of influence among themselves.

Diversity represents the heterogeneity of the composition, organization and dynamics between the different natural, social and economic elements.

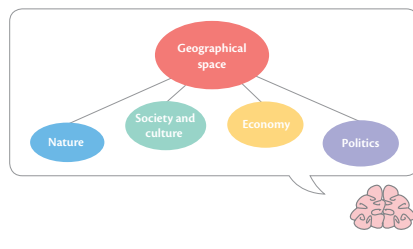


FIG. 1.2 Diagram of the geographical space.

→ Expected Learning

Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

GLOSSARY

Interdisciplinary. Involving two or more academic, scientific or artistic disciplines that are usually considered distinct.

Geographical Space. Defines space organized by society-human groups in their interrelation with the environment.



FIG. 1.1. Sydney, Australia.

SESSION INFORMATION

Week: 1

Session: 2

Expected learning outcome: Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

CONTENT DELIVERY

Start: Students should read the questions in the section *How much do you know?* Then, have them discuss the questions in whole class. For the last activity, ask them to use the map of Mexico and the atlas in order to solve the activity. Check it.

Development: Students should read the page. Once they finish, they should write a seven-question quiz. Then, they will exchange notebooks and answer each other's quiz. Elicit answers.

Closing: Students should have their quizzes fully answered.

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SKILLS DEVELOPMENT

Visual/Spatial skills: Locating places in a map.

Reading skills: Scanning, reading for detail.

Critical thinking skills: Formulating questions.

Interpersonal skills: Sharing information.

EVALUATION OF CONTENT

Check students quizzes fully answered.

SESSION INFORMATION

Week: 1

Session: 3

Expected learning outcome: Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

CONTENT DELIVERY

Start: Students should identify the natural, social and economic components of the geographical space shown in the picture. Elicit answers in whole class. Have students read the introduction of the section and then do the analysis explained in the section *Apply your knowledge*.

Development: Students will read the rest of the information on the page. Have them reflect upon their own area, ask them questions to help them analyze the place where they live.

Closing: Students should describe their area in an essay answering the question: How is my local area? Remind students of the writing process: Pre-writing, drafting, revising, editing, proofreading, and publishing.

Homework for the teacher: Prepare three pictures of the same place in different time (in the beginning, the middle and the end of the XX century, for instance).

Project

GLOSSARY

Absolute population. The total population of a place.

Relative population or population density. The number of inhabitants per square km.

Natural, Social, Cultural, Economic and Political Components of the Geographical Space

Elements of geographical space can be classified in three main groups:

1. *Natural components* are those relating to nature, among which can be found those of a physical nature such as topography, climate, water, soil and subsoil, and those of a biological nature like flora and fauna.
2. *Social components* point out the specific characteristics of a population such as **absolute population** and **relative population or population density**.

density, its relationship to the environment and the transformation of geographical space, cultural traits, language, religion, historic evolution and political structure.

3. *Economic components* are represented by all the activities done by groups through the exploitation and use of natural resources. For example: fishing, agriculture, livestock, hunting, industry, transportation, trade, tourism and finance.

Apply your knowledge



FIG. 13 Fishermen of Guerrero.

Identify the characteristics of geographical space

Look at the picture and identify the natural, social and/or economic components of geographical space. Write the information in your notebook.

- Identify the natural, social and/or economic components of geographical space.

Diversity of Geographical Space

Look around you. Notice the wide diversity of elements that you see. You will find both physical and man-made elements. The physical environment provides resources, landscapes or natural sceneries where various activities can be carried out, whether they are economic, political or cultural.

The interaction between these various factors shape geographical space: forms, environments, social construction and economic organization. Geographical space is dynamic and temporary because its construction and transformation are continuous throughout time.

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10

SKILLS DEVELOPMENT

Critical thinking skills: Observing.

Naturalist skills: Observing details.

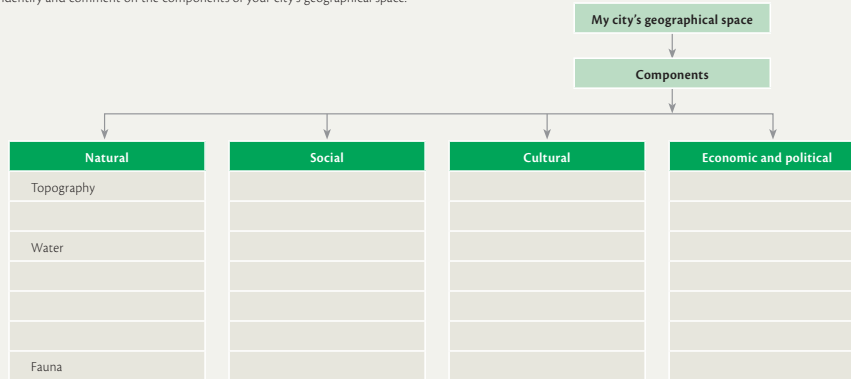
Writing skills: Writing process.

EVALUATION OF CONTENT

Check students' essays.

How much did I learn?

In teams of four, identify and comment on the components of your city's geographical space.



Discuss the classification of the components you have listed with other teams.
Look at the three images carefully and complete the instructions with your team:



FIG. 14



FIG. 15



FIG. 16

- Point out how many significant differences you find in the geographical spaces between photos one and two; how many between two and three and explain how these differences originated.
- Explain what happened with the geographical space in the first photo.
- Observe and compare the three photographs above and state which characteristic is easier to explain: *distribution* or *diversity*. Explain your answer.

SESSION INFORMATION

Week: 1

Session: 4

Expected learning outcome: Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

CONTENT DELIVERY

Start: Ask students what aspects are to be considered when doing a description of a place. Elicit answers.

Development: Students should work in teams of four people. They will complete the chart describing their city or community. Elicit answers from different people.

Closing: Show students some pictures of the same place but in different time the ones that were homework for the teacher the previous lesson. Students should write a small text stating the differences they see in the pictures.

11

SKILLS DEVELOPMENT

Critical thinking skills: Remembering, observing.

Visual/Spatial skills: Comparing and contrasting.

EVALUATION OF CONTENT

Check students' descriptions of the pictures you show.

SESSION INFORMATION

Week: 1

Session: 4

Expected learning outcome: Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

CONTENT DELIVERY

Start: Have students analyze the introductory pictures using the questions in the section *How much do you know?* Elicit answers in whole class.

Development: Students should read the page and they should give the definition of place, environment, landscape, region and territory. Elicit definitions.

Closing: Students should name places, environments, landscapes, regions and territories they know.

Categories of Spatial Analysis: Place, Environment, Landscape, Region and Territory

How much do you know?

Look at the photos and discuss the following questions with your classmates:

- What similarities do you find between the Guarani and the Huastecs?
- To what cultural region do the Huastecs belong?
- Discuss the environment in which each of the groups live. Is it identical, similar or different? Why?



FIG. 1.7 Guarani



FIG. 1.8 Huastecs

When we observe planet Earth, we can distinguish several geographical spaces. These spaces stand out because of their specific characteristics as well as those that differentiate them. The connecting categories that can be addressed on a local, national and global scale are:

The **place** is the smallest category of analysis of the geographical space: it refers to a specific and unique place. Places can be found through their coordinates—each one having a specific location—or by their common name, although they might lack established limits (Fig. 1.9).



FIG. 1.9 The "place" is the smallest unit of analysis of the geographical space.



FIG. 1.10 "Landscapes" can also be urban.



FIG. 1.11 A "region" has uniform and specific characteristics.

The **environment** is the result of the interaction between nature and society. It is the space in which human beings carry out their activities.

The **landscape** is the geographical space we perceive, such as mountains, roads, factories, fields, etc. There are basically two types of landscapes: the natural ones, where elements with no human intervention prevail, and the cultural ones, whose original natural components have been modified in their entirety as a result of human activity (Figs. 1.10,1.11).

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SKILLS DEVELOPMENT

Critical thinking skills: Defining concepts.

EVALUATION OF CONTENT

Check students can name an example of each concept.

The **region** is a continuous extension of Earth's surface that has homogenous and unique characteristics; therefore the region is similar in its geographical components. Regions can be natural, cultural and economic (Fig. 1.11).

The **territory** refers to a geographically limited space from a cultural, historic and political point of view. A territory, depending on its scale, can be a country, a federal entity, a county or a borough.

Apply your knowledge

Mark with an X the category of spatial analysis that corresponds to each component.

Component	Category of spatial analysis				
	Place	Environment	Landscape	Region	Territory
Weather of the northern part of Mexico				X	
Common characteristics of an ethnic group				X	
Ecosystem diversity			X		
Autonomy and sovereignty					X
Fauna and flora			X		
Use of natural resources	X				
Social and economic development		X			
Establishment of international borders					X

Share your answers and discuss:

- Discuss what component(s) is/are analyzed in the various categories and why.
- Explain what components are closely related.
- Think about the interrelation of the various categories and the dependence of the factors they share.

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SESSION INFORMATION

Week: 2

Session: 5

Expected learning outcome: Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

CONTENT DELIVERY

Start: Students should tell the definition of place, environment, landscape, region and territory. Organize a game. Write each word on a paper. One student goes to the front and draws the concept. Students should guess what concept he is illustrating.

Development: Students should answer the chart. Elicit answers.

Closing: Discuss in whole class the last questions of the page.

SKILLS DEVELOPMENT

Critical thinking skills: Remembering, analyzing, and applying information.

EVALUATION OF CONTENT

Students should get the table checked by the teacher.

SESSION INFORMATION

Week: 2

Session: 6

Expected learning outcome: Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

CONTENT DELIVERY

Start: Students should predict what the relation is between the components mentioned in the title.

Development: Students should read the page. Help with vocabulary as necessary.

Closing: Students should mind map the information on the page.

GLOSSARY

Abiotic. Correspond to non-living factors in the environment.

Biotic. Living organisms or systems of organisms.

Anthropic. Produced by man.



FIG. 1.13 A geologic process in a natural region.

FIG. 1.12 The diversity of components in Mexico

The Relationship between the Natural, Social, Cultural, Economic and Political Components of the Place, Environment, Landscape, Region and Territory

Mexico is a country where a great variety of natural elements merge with a large population that is heterogeneous, rich in traditions and customs, with distinctive roots and diverse economic activities. It is in a constant process of transformation (Fig. 1.12).

Its natural, social, cultural and economic elements maintain a close relationship in each of the categories of geographical analysis.

The dynamics of the **abiotic, biotic** and **anthropic** components of each of the geographical spaces are so varied that there are multiple causes that make them different. For example, certain physical factors of the topography might facilitate or restrict human access, farming and the construction of housing units.

The landscape can also be viewed as a socio-territorial reality, in which a natural landscape can be transformed into a cultural one. This mutual influence evolves through constant interaction. This allows us to perceive, for example, that in the northern region of Mexico, social and natural

conditions are very different from those that prevail in the southern region or in the Gulf.

In some natural regions, certain factors resulting from a geologic process distinguish them from others (Fig. 1.13).

Climates are determined by elements such as temperature, atmospheric pressure, wind, humidity, cloudiness, precipitation and evaporation, and can be modified by factors such as latitude, altitude, topography, land and sea distribution, distance from the sea and marine currents, ozone layer variations, desertification, etc. In other words, a natural region contains a specific climate with particular flora and fauna. Climate distribution is the most important factor in the disposition of natural regions on the planet; however, economic activities have contributed to climate variation significantly in natural regions as well.

Climate affects an organism directly as well as indirectly because of its effects on the soil, flora and agriculture.

Some climates can even set limitations, which explains why certain regions of the planet are uninhabited and why in other places, environments and territories, the population is dispersed.

Natural regions are determined by the configuration of topography, climate and flora of the region. Natural regions include rainforests, the savannah, tropical forests, the steppe, deserts, mixed forests, prairies, coniferous forests, the tundra and the region of perpetual ice; they tend to always show a coincidence regarding climate zones.

On the other hand, economic activities are determined by the layout of resources. Rocks have a great importance in mining and construction. Volcanic activity has benefitted society greatly by producing fertile soils, adding unique landscapes, and providing settlements and development for human groups in its surroundings. Volcanic regions are perfectly located in different places, environments, landscapes, regions and territories of the world.



14

SKILLS DEVELOPMENT

Critical thinking skills: Predicting, mind mapping.

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Students should get their mind map checked by the teacher.

Mountains span over large extensions of terrain and cross over places, environments, regions and territories. They offer a wide variety of natural resources to these locations; various species of trees in the coniferous forests; the presence of various deposits of minerals and precious metals; tourist activity, as well as the production of electric energy through the use of waterfalls that benefit the places with these resources.

Plateaus make way for important human settlements. Their shape facilitates the construction of cities and the supply of services; it also benefits the economic activity. A high number of human settlements have been established on floodplains due to their farming advantages and the commercial relations they create.

Topographic contrasts in a country or territory provide different aspects and degrees of regional or local development due to the rich variety of natural resources.

Moreover, ocean waters also have a close relationship with the spatial categories that use their resources. The continental platform holds an important economic value because it is where intense fishing and touristic activities take place, as well as maritime transport and gas deposits.

The distribution of fresh water is uneven throughout the continents. In tropical and temperate climates, we find regions where fresh water abounds, but in others it is lacking, such as the dry steppe climate and the dry desert climate.

The geographical spaces that have this resource not only benefit from high risk districts but are also a great touristic and sporting attraction. Rivers create electricity, and those with intense flow are used as links or means of transportation. The economic value of lakes lies in their agricultural and domestic use. In some countries, like Mexico, people work at water treatment plants.

The dramatic increase in the population has caused water consumption worldwide to triple from 1950 to today. The water issue and its use create a serious challenge.

The different categories of geographical space are interrelated directly with environmental changes. The variation of one affects the others.

The increase in population is a global fact but it is, however, **heterogeneously** spread out. This means that there are highly populated regions and others with few inhabitants. The geographical distribution of the population implies economic and cultural differences.

In most countries of the world, excessive population growth has had its consequences. The demands for public services such as health, housing, education, work, etc., have become great challenges for many governments.

Progress has brought a variety of positive elements to man, such as science and technology, but it has also sacrificed the environment, causing massive damage. The continuous tree felling and exploitation of plant species; the extinction of animal species; the excessive pollution of the soil, seas, rivers, lakes and atmosphere; the destruction of the ozone layer and the irrational exploitation of natural resources are only a few examples of the consequences of overpopulation.

The key is to find a harmonious balance between nature and man (Fig. 1.14) that allows for **sustainability** in the use and care of the environment and its resources. We are all responsible for caring for water, plants, animals, rivers, lakes, seas, etc., avoiding their misuse and polluting them with substances and/or waste.

On the other hand, it is complicated to break the tie between nature and culture. No culture can be fully understood without the slightest exploration of its environmental context. Cultural regions show similar characteristics in the basic elements of a culture, such as religion, language and history.

The parallelism between the economic components and the spatial categories are essentially found in the location of natural components, such as topography, altitude, hydrography, climatology and **pedology**, which require specific economic activities that are based on the natural resources and nature of the physical environment.

The territory defines the identity of a social group, on a local as well as national level. Through its landscape, it reflects the environmental history of the interaction between the propensity of natural resources, the technological processes of transformation and the result of the economic activities of its inhabitants.



FIG. 1.14 Harmonious balance between nature and man.

GLOSSARY

Heterogeneous. Diverse in character.

Sustainability. Balance, moderation.

Pedology. The science that addresses nature and soil conditions and its relationship to plants.

Curious Fact

Farms that supply meat for the inhabitants of cities are responsible for the loss of important rainforests in Central America and Brazil. Millions of trees have been felled to give way to the grazing of livestock.

15

SESSION INFORMATION

Week: 2

Session: 7

Expected learning outcome: Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

CONTENT DELIVERY

Start: Select at random one or two students to explain the mind map they made the previous session in whole class.

Development: Students should read the page. Help with vocabulary problems. In pairs or trios, students should make a crossword puzzle with information from the page. For example:

Across

1 _____ span over large extensions of terrain.

Answer: M o u n t a i n s

Closing: Students should exchange crossword puzzles and answer each other's work.

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Formulating questions.

Visual/Spatial skills: Doing jigsaw puzzles.

EVALUATION OF CONTENT

Students should get their crossword puzzle checked by the teacher.

SESSION INFORMATION

Week: 2

Session: 8

Expected learning outcome: Learn to recognize the diversity of natural, social, cultural, economic and political components that make up geographical space.

CONTENT DELIVERY

Start: Students should name some of the components of geographical spaces. Elicit in whole class.

Development: In pairs, students should look at the pictures and carefully describe all kinds of details they can see. Later, with a partner they should answer the table.

Closing: Check the answers in the table. Students should give reasons why they choose or gave those descriptions.

Differences in the Various Places, Environments, Landscapes, Regions and Territories of the World

There is a wide variety of natural, economic and cultural diversity in the world. Its regions differ from each other through natural landscapes, their socioeconomic and cultural characteristics. Culture is a set of social practices that includes language, religion, politics, social and economic organization. It

marks out and modifies the natural regions according to its traditions and ways of thinking. Clothing and music are a reflection of the adaptation to the environment, and are cultural traits that identify the existing relationship between the nature of a place and the social group it belongs to.

How much did I learn?

Work in pairs and identify the characteristics of the following geographical spaces.



FIG. 1.15 Peña de Bernal, Queretaro.



FIG. 1.16 Archeological site in Edzna, Campeche.



FIG. 1.17 A church in Saltillo, Coahuila.



FIG. 1.18 Main square of the capital, Mexico City.

- Look carefully at the images above and complete the following table.
- Connect the categories of analysis that are shown in the geographical spaces.

Place	Landscape			Environment		Region	Territory		Geographical components		
	Cultural	Mixed	Natural	Rural	Urban		Country	Entity	Natural	Social	Economic
Bernal		X		X		Bajío	Mexico	Querétaro	Cacti, drylands	Buildings, houses, people	Tourism and trade
Edzna	X			X			México	Campeche	Small hills, jungle	Archeological site	Tourism
Saltillo		X			X		México	Coahuila	Semi-desert to forests	Buildings, houses, people	Trade, tourism
Main square D.F.	X				X		México	Mexico City		Buildings, houses, people	

- Mark which places share the most similarities.
- Show which ones have the least characteristics in common and explain why.

16

SKILLS DEVELOPMENT

Critical thinking skills: Remembering, observing.

Visual/Spatial skills: Observing details.

Naturalistic skills: Looking, writing and discussing.

EVALUATION OF CONTENT

Students should get their table checked by the teacher.

Differences in the Cartographic Representation of Local, National and Global Scales

How much do you know?

Look at the map and discuss with your classmates:

- Indicate if you can identify countries, capitals, rivers, highways and volcanoes on the map.
- Mention the type of map you would need to locate the details of the place where you live.
- What type of map do you need to represent a country?
- Define the criteria to select a map.



MAP 1.1 Political division of Mexico
SOURCE: Compilation based on www.cuentame.inegi.org.mx

Cartography is one of geography's auxiliary sciences and is related to the representation of the earth's surface. Its main function is the elaboration of maps, blueprints and globes. A map is an abstraction of reality where the earth's surface is represented in its entirety or in parts. From a technical point of view, a map is the transformation of real space into one in which the various elements that make up the geographical space are duly represented. In Mexico, the National Institute of Statistics and Geography (*Instituto Nacional de Estadística y Geografía*, INEGI) is in charge of this task (Fig. 1.19). With the help of technological advances, this institute makes more and more precise and detailed maps as time goes by (Map 1.1).

Maps are a testimony to the evolution of man and his way of thinking. To achieve an ideal analysis of geographical space, different types of scales such as global, national, regional and local ones must be used. The use of such scales shows differences, similarities and relationships between the geographical spaces; their correct use results in a complete and detailed analysis (Table 1.1).

The global scale considers the planet as a whole, and distinguishes events and phenomena whose existence and distribution span over great continental dimensions. The national scale focuses on the study of a limited space within a country's territories and borders, allowing for the distinction of the political organization through states. The regional scale is useful when one wants to know the characteristics of a space located in a specific area of a country. And the local scale - the smallest in size - is of great use to get to know a city, a town, a place or a landscape in great detail.

Scale	Categories of analysis
Global	Continental
Regional	Natural, economic or cultural regions
National	Countries, federal entities, townships and boroughs
Local	Villages, cities, towns, farms, shantytowns, etc.

→ Expected Learning

Learn to recognize the use of numerical and graphic scales to represent the territory on maps.



FIG. 1.19 Besides mapping, the INEGI is in charge of the population census

TABLE 1.1 Scales for cartographic representations.

SESSION INFORMATION

Week: 3

Session: 9

Expected learning outcome: Learn to recognize the use of numerical and graphic scales to represent the territory on maps.

CONTENT DELIVERY

Start: In pairs, students should ask and answer the questions in the section *How much do you know?* Once they finish, elicit answers in whole class.

Development: Students should read the information on the page. Ask them the following comprehension-check questions: What is cartography? What is a map? Which is the institute in Mexico in charge of making maps? Maps are testimony of what? Which are the four scales of a map? Can you describe each scale?

Closing: Check students' synoptic tables.

Answer key

How much do you know?

- No, they cannot be identified.
- To locate the details of a place, a regional or local map is used.
- To represent a country, a national map is used.
- The criteria to select a map depend on the uses we will give them.

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Visual/Spatial skills: Charting information.

EVALUATION OF CONTENT

Students should get their synoptic table checked by the teacher.

SESSION INFORMATION

Week: 3

Session: 10

Expected learning outcome: Learn to recognize the use of numerical and graphic scales to represent the territory on maps.

CONTENT DELIVERY

Start: Ask students again the comprehension-check questions from the previous session. Elicit answers in whole class.

Development: Students should complete the chart according to what they understood with the information from the previous unit.

Closing: Check students' answers in whole class. Ask them to give reasons for their answers.

Homework: Students should take a map of Mexico, a map of America, a world map and a ruler the following class.

Apply your knowledge

When conducting geographical research, it is important to identify the most convenient scale to use for that specific study, according to the category of spatial analysis needed.



MAP 1.2 Map of the world
SOURCE: Compilation based on www.cartesia.org

Check with your teacher and classmates.

- Mark with an X the appropriate scale for each event and explain your selection.

Event	Global	National	Regional	Local
Man's migration through the Bering Strait.	X			
Location of the Bufo mountain.			X	
Ecosystem distribution of a temperate forest.	X			
Location of the Huasteca area.			X	
Location of the state of Chiapas.		X		
Transportation in the city of Zacatecas.				X
Navigation routes of 16th century Portuguese sailors.	X			

Kells

18

SKILLS DEVELOPMENT

Critical thinking skills: Remembering, applying information.

EVALUATION OF CONTENT

Check students' charts.

Numerical and Graphic Scales on Maps

The scale on a map is the relationship between the real dimensions of the surface that is being represented and its proportion on the map. The scale always indicates the amount of times the surface represented on the map has been reduced. There are two types of scales: numerical and graphical.

The numerical scale indicates how many times smaller the representation is compared to the actual surface represented, and it is displayed as follows: 1:10, 1:100, 1:1000, meaning that the measurement on the map is equivalent to 10, 100, 1,000 times the same measure on the surface; it is the proportion where the numerator shows the longitude on the map and the denominator shows the real dimensions.

The different categories in which maps can be classified according to the numerical scale are shown in Table 1.2.

Types of representation	Interval between scales
Cartographic representations	1:500,000 – greater denominators
Charts	1:250,000 – 2:500,000
Blueprints	1:25,000 – lower denominators

TABLE 1.2

The numerical scale is normally found at the bottom of maps (Fig. 1.20).

The graphic scale is shown in a rectangle divided into three parts, which represent one or more kilometers of the surface. This line has a number scheme that goes from zero to the final longitude of reach and indicates the distance in kilometers or meters from one side of the rectangle to the other. To calculate the distances, you only need a small ruler to measure the number of centimeters from one point to the next and then place the ruler on the scale. This scale is of great use because it allows us to calculate the equivalent number of kilometers or meters in real life (Fig. 1.21).



FIG. 1.20 Numerical scale

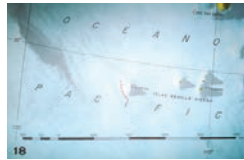


FIG. 1.21 Graphic scale

Apply your knowledge

To set up a scale, first it is necessary to practice unit conversion. What this means is that if our map is in meters or kilometers, we must change the units on our sheet of paper into centimeters.

- With your teacher's help, change the equivalencies on the left and complete the table by doing the necessary calculations. Discuss with your group.

Scale (in centimeters)	Centimeters	Meters	Kilometers
1:100,000	100,00	1,000	1
1:25,000	25,000	250	0.25
1:1,000,000	1,000,000	10,000	10
1:35,000,000	35,000,000	350,000	350
1:1,240,000	1,240,000	12,400	12.4
1:120,500	120,500	1,205	1.205

Once you finish, answer these questions individually in your notebook:

- What difficulties did you encounter when doing the conversions?
- In the table above, what was the largest scale? Would it be helpful if we wanted to represent an event on a global scale?
- Which scale would be the most useful to represent a local geographical space?
- What does the use of different scales depend on?

SESSION INFORMATION

Week: 3

Session: 11

Expected learning outcome: Learn to recognize the use of numerical and graphic scales to represent the territory on maps.

CONTENT DELIVERY

Start: Ask students to examine the maps they were asked to take to class. They should find the name of different countries, states or regions you choose and underline them. Then, they should find the scale on each map. Ask them what they think those numbers mean. Elicit answers.

Development: Students should read the page. Ask them what 1:10000 in a map means. Elicit answers. Help them go through the text to identify key concepts such as what the numerator and denominator mean, how to calculate distances with the help of the line and a ruler.

Closing: Students should answer the table. Help them at first, showing them how to get each number. Then, they should complete it in pairs. Elicit answers in whole class.

19

SKILLS DEVELOPMENT

Logical/Mathematical skills: Doing operations.

Naturalist skills: Observing details.

EVALUATION OF CONTENT

Students should get their table checked by the teacher.

SESSION INFORMATION

Week: 3

Session: 12

Expected learning outcome: Learn to recognize the use of numerical and graphic scales to represent the territory on maps.

CONTENT DELIVERY

Start: Show students a map with a scale and they should choose two points in the map. Organize a competition so that the first team to find the distance between the two points is the winner.

Development: Students should read the information on the page. Help with vocabulary as necessary.

Closing: They should complete the table with the recommendable scale according to the event. Elicit answers in whole class and ask them to argument their answers.

Homework: Students should get a map that has longitude and latitude divisions.

Scale and Distance Calculation on Maps

To Learn More

On the webpage, you will find a digital map of Mexico where the scale is always visible and will give you the dimensions and distances of your places of interest.
<http://gaia.inegi.org.mx/mdm5/viewer.html>

Numerical and graphic scales estimate distances on a map. For example, if a graphical scale indicates a distance of 100 kilometers and has a distance of 2 centimeters, each centimeter equals 50 kilometers. To know the real distance of 4.8 centimeters on the map, just multiply 50×4.8 and the total will be 240 kilometers.

The numerical scale is the arithmetic relationship between the real surface of the area and its representation on a map, chart or plan. To calculate the real distance in kilometers, you must multiply the centimeters that separate the two points on the map by the scale with which it was drawn and convert the result into kilometers.

The Use of the Numerical and Graphic Scales in Cartographic Representations

Scales are of great importance to maps because they allow us to fully comprehend the evolutionary processes of the geographical space and each of its elements.

The use of the numerical scale lies in the fact that the detail of the represented elements and their variables are always proportional. In geography, scales encompass the totality of the planet down to the smallest scale.

The graphical scale portrays, through the use of a straightedge, the distance between cities, towns, bodies of water, mountains, etc., including the calculation of transfer times between two places. By using a graphical scale you can plan trips, calculate the diameter of a hurricane, the extension of a disaster zone or the size of an agricultural area.

The representation of a town, state, country, region or continent on a map can be smaller or bigger, depending on the scale that is used.

How much did I learn?

Complete the following table by checking the category that corresponds to the magnitude of the event and recommend a scale to use. Don't forget to explain your answer in the corresponding column.

Events	Scale				Recommended scale on your map	
	Global	National	Regional	Local	Numerical	Graphical
Continental drift	X				X	
Migration	X	X	X		X	X
Mining production in Zacatecas		X	X			X
A visit to Paris			X	X		X
The distribution of an ecosystem	X	X			X	
First World War	X		X		X	
Global warming	X				X	
Population growth	X	X			X	
Forest and fishing regions	X	X			X	X

• Think if one event could be approached with different scales. If so, which one(s)? Discuss with your classmates and teacher the use of scales in cartographic representations.

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SKILLS DEVELOPMENT

Critical thinking skills: Applying information.

EVALUATION OF CONTENT

Check students' tables.

Earth's Circles and Points: Parallels, Meridians and Poles

How much do you know?

- Choose the answer according to the representation or technology that you would use to find any of these spots on Earth's surface.

1. Satellite image 2. Map 3. Photographs or aerial images 4. Sketch 5. GPS

	Context
(5)	You're driving the latest car and don't know how to get to the Papalote Museum in Mexico City.
(2)	Someone asks you what route Cortés took on his way to the Valley of Mexico.
(1)	You are watching Mexico's weather report on TV.
(3)	You have to locate the different climates of America for your geography homework.
(2)	In history class, they ask you to portray the beginnings of the battle of the Persian Gulf.
(5)	Shows the intense morning, evening and night traffic in the city.

- Explain which of the representations you use more frequently to locate a place and discuss them with your classmates.

The oldest representations used similar symbols to those used currently in order to show the location of natural elements or humans. It wasn't until the Renaissance that the first maps appeared with perpendicular traced lines called parallels or lines of latitude and meridians. This was the beginning of the establishment of lines and circles on Earth that would facilitate the location of specific points on the planet.

Lines and points are all imaginary but provide great accuracy when locating a specific place. The main lines are called **meridians** and **parallels** (or lines of latitude) (Map 1.3).

Parallels are perpendicular to Earth's axis of rotation; the equator is the main circle that divides Earth in two hemispheres, north and south, and is also known as parallel (0°). From the equator all the way to the northern and

southern hemispheres, a series of parallel circles appear; their importance lies in their delimiting of the thermic zones on the planet. All together they establish the coordinate known as latitude. The most important parallels astronomically speaking are the Tropic of Cancer and the Arctic Circle in the northern hemisphere; and the Tropic of Capricorn and the Antarctic Circle in the southern hemisphere. Parallels cut meridians creating right angles. This is consistent throughout the globe, except in the poles, where the curvature is more pronounced because Earth is not a sphere but a **geode** (shape of Earth).

Meridians are semicircles that are perpendicular to the equator; their direction is from pole to pole. They determine the coordinate known as longitude. The complete circle is made up of one meridian and its **anti-meridian**. Two

→ Expected Learning

Locate places and time zones on maps based on geographical coordinates and time zones.

GLOSSARY

Anti-meridian. The opposite meridian.

SESSION INFORMATION

Week: 4

Session: 13

Expected learning outcome: Locate places and time zones on maps based on geographical coordinates and time zones.

CONTENT DELIVERY

This topic will be two sessions long.

Start: Students are to be set in teams. They will answer the introductory questions in the section *How much do you know?* Elicit answers in whole class.

Development: Students should read pages 21 and 22. They should make a synoptic table or mind map of both pages' information. Elicit one example of each one.

Closing: Prepare latitude and longitude of different locations in the world. Students should find the places you talk about.

21

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Students should be able to find the places whose coordinates you previously prepared.

SESSION INFORMATION

Week: 4

Session: 14

Expected learning outcome: Locate places and time zones on maps based on geographical coordinates and time zones.

CONTENT DELIVERY

This topic will be two sessions long.

Start: Students are to be set in teams. They will answer the introductory questions in the section *How much do you know?* stated in the previous page. Elicit answers in whole class.

Development: Students should read pages 21 and 22. They should make a synoptic table or mind map of both pages' information. Elicit one example of each one.

Closing: Prepare latitude and longitude of different locations in the world. Students should find the places you talk about. For example: In Latitude 51, longitude -0.12 is: London. In Latitude 19, longitude -99 is: Mexico City.

Curious Fact

The equatorial circumference of the earth measures 40,076 km. If, on average, the length of a person with his arms stretched out measures 1.50 m, an estimate of 27 million people would be needed to go around the earth.

Curious Fact

Keeping in mind the flattening of the Earth, it is important to note that the distance of one degree of latitude varies slightly from the equator to the poles. The distance at the equator is 110.6 km, while at the poles it is 111.7 km, that is, 1.1 km longer. Therefore one degree of latitude at the poles is one percent longer than at the equator.

GLOSSARY

Level curves. Lines that link two points of the same altitude.

meridians stand out in particular for their importance: Greenwich, which has become a reference, by international agreement, to measure the longitude of any place on the surface of the earth, as well as to establish time zones; the meridian opposite to Greenwich is known as meridian 180°, and functions as an international timeline for the change of dates. These two meridians, Greenwich and its anti-meridian, divide the earth in two hemispheres: east and west. The meridians, unlike parallels, start from one pole and reach the other by forming a semicircle throughout their trajectory.

Poles are the points located on the northern and southern ends of our planet. They are also the tips of another imaginary line called Earth's axis, which is the line on which the planet spins. The poles are a place of convergence of the parallels and meridians on an imaginary plane.

There are an infinite number of meridians and parallels on the planet, which have designated values according to the hemisphere they are on. This infinite network of vertical and horizontal lines is called system of geographical coordinates.



MAP 1.3 Ancient map showing the equator, the parallels and the meridians.

The Importance of Geographical Coordinates: Latitude, Longitude and Altitude

The set of vertical and horizontal lines (parallels and meridians) is called the coordinates system; all the places, territories, people and processes can be located using this network of geographical coordinates. The geographical coordinates are measured in degrees (°), minutes (') and seconds ("). Latitude has a North or South orientation or direction in relation to the equator, and longitude has an East or West orientation in relation to the Greenwich meridian. Three coordinates are considered essential to locate accurately a point on Earth's surface: latitude, longitude and altitude.

Latitude is the distance that exists between any point on Earth's surface and the equator (0°). Its values are in degrees and go from 0° to 90° and

can be north or south depending on its location in relation to the equator.

Longitude is the distance that exists between any point on the surface of Earth and the Greenwich meridian (0°). Its values are in degrees and range from 0° to 180° and can go from east to west according to its location in relation with the Greenwich meridian.

Altitude is the measurement of the distance between a point on Earth's surface and sea level, which has an assigned altitude of zero meters (0m). It is measured vertically in meters. **Level curves** are used to represent altitude in maps.

22

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Students should be able to find the places whose coordinates you previously prepared.

Apply your knowledge

If we only know the longitude of a point, we will not be able to specify its location since the same arch of longitude measured corresponds to one whole meridian. Therefore, we need another reference. The same thing would occur if we only knew the latitude but not the longitude. Consequently, the geographical coordinate must always be composed of the longitude and latitude values.

- If you had to fly 20° 0'00" E, without knowing the exact latitude, what countries and seas would you be flying over?

To do the following activity, go on the Internet. You can download and use Google Earth for free. If you cannot access the site, use an Atlas.

- Note the geographical coordinates (latitude and longitude) of the cities in the table. When you finish, go to the table on the right and do the opposite, based on the given latitude and longitude, write the name of the place.

- In your notebook, explain what differences and similarities you can see between the last four places on the table on the left? As a group, look into what other places around the world could be mixed up and discuss them.
- Comment if you were able to find all the places on the table on the right and why?
- Point out which of these places is closest to your city.
- Look up your city's coordinates and write them down at the end of the column on the table on the right.

Place	Coordinates	
	Latitude	Longitude
Rome, Italy	41°53'41"N	12°29'02"E
Brasov, Romania	45°38'55"N	25°36'22"E
Tiburón Island, Mexico	28°59'50"N	112°23'18"W
La Paz, Bolivia	16°30'00"S	68°09'00"W
Paris, France	48°51'12"N	02°20'56"E
Cordoba, Spain	37°53'00"N	04°46'00"W
Cordoba, Colombia	01°44'22"N	75°36'05"W
Cordoba, Argentina	31°24'00"S	64°11'00"W
Cordoba, Mexico	18°53'00"N	96°56'00"W

Place	Coordinates	
	Latitude	Longitude
Garden St Near Storey...	33° 56' 11" S	151° 14' 31" E
New Delhi, India	28° 37' 22" N	77° 12' 22" E
Oslo, Noruega	59° 54' 63" N	10° 45' 64" E
Ministerio Da Justiça...	38° 42' 85" N	9° 08' 44" O
Socorro Island, Mexico	18° 47' 35" N	110° 57' 70" O
Rimac, Peru	12° 02' 97" S	77° 01' 87" O
Lusaka, Zambia	15° 02' 97" S	28° 17' 49" E
Mexico, City	19° 25' 43" N	99° 07' 86" O
Your city		

SESSION INFORMATION

Week: 4

Session: 14

Expected learning outcome: Locate places and time zones on maps based on geographical coordinates and time zones.

CONTENT DELIVERY

Start: Ask students how it is possible to locate a specific place. (Using latitude and longitude).

Development: Students should read the information on the page and complete the table. Elicit answers in whole class.

Closing: Students should discuss the questions on the page.

23

SKILLS DEVELOPMENT

Visual/Spatial skills: Finding locations with the help of a map, locating places with latitude and longitude.

EVALUATION OF CONTENT

Check students' tables.

SESSION INFORMATION

Week: 4

Session: 14

Expected learning outcome: Locate places and time zones on maps based on geographical coordinates and time zones.

CONTENT DELIVERY

Start: Students should read the information on page 24. Help with vocabulary as necessary.

Development: Students should write 7 comprehension-check questions.

Closing: Students should exchange notebooks with a classmate to answer the comprehension-check questions they wrote.

Homework: Students will need a world map.

The Importance and Use of Time Zones



FIG. 1.22 Mexico City International Airport.

To Learn More

Go to <http://www.google.es/intl/es/earth/index.html>

The movement of Earth around its own axis is called rotation. It determines various consequences such as: the succession of day and night, the obvious movement of the stars, the deviation of bodies during free fall, the deviation of winds and currents, polar flattening and the time differences.

Two of the most obvious consequences the population can perceive are day and night and the time differences, both of which are closely related. This leads to the establishment of a universal and standardized system for the use of time. Therefore, in the 19th century, the time zone system was established and fixed to the Greenwich meridian, also known as GMT (Greenwich Mean Time) or Universal Time. Since its invention it has become possible to prevent communication problems, broadcast important events in every country of the world, coordinate and program transportation of goods and flight times (Fig. 1.22).

There are 24 time zones around the world; each one represents a different time. A time zone is one of the 24 time zones conventionally traced on Earth's surface, with the geographical poles at its opposite ends. Time zones are strips of 15° of longitude. This system is based on the fact that Earth

completes a cycle on its axis in a 24 hours span, which results in 24 sections of 15° of longitude (Map 1.4).

At any given point in the time zone, the same amount of light is received at the same hour, in the northern hemisphere as well as the southern; that hour is known as the legal hour. To calculate the time difference, you normally add if the movement is towards the East, and subtract if the shift is to the West. The number of zones you go over will determine the time of the place. Certain countries have modified their legal time according to internal and external needs, and this time adjustment is known as the official time. Mexico has modified its legal time according to its time zones to match it with state limits. Since 1996, it has adopted daylight saving time (DST) to save electric energy. Mexico has three legal time zones, as you can see on the map (Map 1.5).

Due to its extension, three meridians cross the national territory: time zone 90° (Central Time), which takes up most of the surface of the country; time zone 105° (Mountain Time), which applies to the following states: Chihuahua, Sonora, Sinaloa, Nayarit and Baja California Sur; and time zone 120° (Pacific Time), which only applies to Baja California.

To Learn More

In this webpage you will find a world clock and map of time zones: http://24timezones.com/reloj_hora_exacta.php

MAP 1.4 Time zones.

SOURCE: Compilation based on www.timeandtemperature.com

MAP 1.5 Mexico's time zones
SOURCE: Compilation based on www.timeandtemperature.com



TIME ZONES

— Zones regulated by the Coordinated Universal Time (UTC)

Difference between local time and Greenwich Time.

■ -2 ■ -1 ■ 0 ■ 1 ■ 2



TIME ZONES

■ Pacific (-8) ■ Mountain (-7) ■ Central (-6)

24

SKILLS DEVELOPMENT

Critical thinking skills: Formulating questions, remembering.

EVALUATION OF CONTENT

Check students' questionnaires.

Apply your knowledge

A flight from Mexico City International Airport to Indira Gandhi International Airport in New Delhi takes approximately 28 hours. The plane takes off from Mexico City to New Delhi on a Thursday at 18:00 and makes its first layover in Madrid eight hours later. The following times correspond to the flight from Mexico to India.

Work in teams. Use your notebook to write down the answers. Present your solutions as a group.

- What will be the date and time upon your arrival to New Delhi?

- What day must you leave India if you want to get back to Mexico City on Tuesday at 10 am?
- What is the correct date and time to be in Madrid, departing from India, to not lose your flight to Mexico City?
- If you had to land in the international airport of Mexicali, on what date and time would you leave if you wanted to get there on Friday at 11 am?
- According to your answers, what is the importance and use of time zones?

Locate Places and Time Zones on Maps

The graphic coordinates system is a reference procedure that uses the two angular coordinates, latitude and longitude that allow us to locate any point on the surface of Earth. This leads to a meteorological principle that governs the work of geographers, known as the location principle.

To apply this principle, it is necessary to locate the phenomenon or

event on a map, chart or blueprint through its geographical coordinates.

Starting from the Greenwich meridian, Earth is divided into 24 strips, called time zones. The time zones are assigned names that correspond to the places they go through (Table 1.3).

Curious Fact

In the past, each city set its own time, but with the speed and intensity of communications and trade across the world, it was necessary to establish a system of time zones.

Time zones

#	Name	#	Name	#	Name	#	Name
1	Bering Standard Time	7	Eastern Standard Time	13	Central European Time	19	Indochina Time
2	Alaska Standard Time	8	Atlantic Standard Time	14	Eastern European Time	20	Philippine Time
3	Pacific Standard Time	9	Brasilia Time	15	Caucasus Standard Time	21	Japan Standard Time
4	Mountain Time	10	Azores Time	16	Yekaterinburg Time	22	Australia Eastern Daily Time
5	Central Time	11	Canary Islands and Iceland Time	17	Kyrgyzstan Time	23	Kamchatka Time
6	Mountain Standard Time	12	Western European Time	18	China Standard Time	24	Fiji Time and New Zealand Standard Time

TABLE 1.3 Time zones

SESSION INFORMATION

Week: 4

Session: 15

Expected learning outcome: Locate places and time zones on maps based on geographical coordinates and time zones.

CONTENT DELIVERY

Start: Ask students to locate Madrid and New Delhi on the world map. Elicit answers. Students should read the situation about the flight Mexico-Delhi. In teams, they should answer the questions stated in the section *Apply your knowledge*.

Development: Students should mark the Time Zones in their world map and write their names following the example map on the book (page 24).

Closing: Check students' maps.

Homework: Students should take to the following session: A Universal atlas, a world map without political division or names, a world map with time zones, ruler, and pencil.

Answer key

Apply your knowledge

- The plane will arrive on Friday at 16:00.
- Students should leave India on Monday at 8 am.
- Students should be in Madrid on Monday at 16:00.
- Students would have to leave on Thursday at 10:00 am.

SKILLS DEVELOPMENT

Visual/Spatial skills: Locating places.

Critical thinking skills: Problem-solving.

EVALUATION OF CONTENT

Check students' answers to the problem and the map in which they should locate the time zones.

SESSION INFORMATION

Week: 4

Session: 16

Expected learning outcome: Locate places and time zones on maps based on geographical coordinates and time zones.

CONTENT DELIVERY

Start: Explain to students what they should do and show an example; if they do not follow you, do another example. Follow the instructions in the section *How much did I learn?*

Development: Students should complete the table. Elicit answers in whole class.

Closing: Students should answer the final questions, right below the table in pairs. Check students' tables.

How much did I learn?

Gather the following material ahead of time. You must work with the *Universal Atlas of Geography*, or whichever one you used in primary school; you may also use the time zone map that appears on the previous pages.

- a. A white planisphere b. A planisphere with time zones c. Ruler d. Pencil or pen
- Locate the latitude that corresponds to each of the cities in the appropriate column; use your Atlas and write the answers down in your notebook.
 - Write the name of the time zone using your Atlas, time zone map or just look it up on the Internet.
 - Identify the Greenwich meridian and its city of reference. First, locate if it is east or west of the Prime Meridian, add or subtract the hours according to its location and write it down

on the corresponding column. Write the number down if it is to the east, and add a minus sign in front of it if it is located to the west.

- Remember that the Greenwich meridian has a value of 0° and each time zone has a value of 15°, both to the east and west; you add 15° starting from GMT until you reach 180°. For example, 15°, 30°, 45°, 60°, 75°, 90°, 105°, 165° and 180°. Calculate the distance in degrees of the city in the table to the Prime meridian.
- Calculate the time difference (in hours) between each of the cities in the table and our country. Locate Mexico and each of the cities; you already know that the countries to the east will have an hour more and those to the west will have an hour less.

City, Country	Longitude	Latitude	Name of the time zone	Time difference with GMT	Degrees of difference with GMT	Time in relation to Mexico with GMT
1. Bogota, Colombia	4°35'56" N	74°04'51" O	COT	GMT -5	75° to the west	(+1)
2. Buenos Aires, Argentina	34°35'15" S	58° 40' 21" W	ART	GMT- 3"	45° to the east	(+3)
3. Sydney, Australia	33°52'04" S	151°12'26" E	AEDT	GMT+11:00	165° to the west	(+17)
4. La Paz, Bolivia	16°30'00" S	68°09'00" W	BOT	GMT-04:00	60° to the east	(+2)
5. Berlin, Germany	52°31'27" N	13°24'37" E	CET	GMT+01:00	15° to the west	(+7)
6. Hong Kong, China	22°17'07" N	114°09'27" E	HKT	GMT+08:00	120° to the west	(+2)
7. Baghdad, Iraq	33°20'26" N	44°24'03" E	AST	GMT+03:00	45° to the west	(+9)
8. Tokyo, Japan	35°36'53" N	139°34'52" E	JST	GMT+09:00	135° to the west	(+15)
9. Lima, Peru	12°02'35" S	77°01'41" W	PET	GMT-05:00	75° to the east	(+1)
10. Guayaquil, Ecuador	2°10'00" S	79°54'00" W	ECT	GMT-05:00	75° to the east	(+1)
11. San Jose, Costa Rica	9°55'59" N	84°04'59" W	CST	GMT-06:00	90° to the east	(0)
12. New York, USA	40°42'51" N	74°00'21" W	EDT	GMT-04:00	60° to the east	(+2)

In your notebook:

- Make a list of the countries that have an obvious time difference with Mexico.
- Research how these countries go about their commercial relations.
- Research five uses of time zones.

Answer the following questions in your notebook:

- When it is 12:00pm GMT, what time is it in Lima, Peru?
- When it is 2:00pm GMT, what time is it in Guayaquil, Ecuador?
- When it is 9:00pm GMT, what time is it in San Jose, Costa Rica?
- When it is 7:00am GMT, what time is it in Sydney, Australia?
- When it is 1:00am GMT, what time is it in Baghdad, Iraq?

Kells

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SKILLS DEVELOPMENT

Critical thinking skills: Applying information.

Visual/Spatial skills: Locating places.

EVALUATION OF CONTENT

Check students' tables.

Main Cartographic Projections: Cylindrical, Conic and Azimuthal

How much do you know?

In your notebook, explain what tools you consider necessary to locate a specific point on the globe. Look at maps 1.3 and 1.7.

- Analyze, explain and write down the differences you find between these two maps.
- Analyze and show what continent has the largest area on a map, and why this occurs.
- Point out the smallest one, research and analyze it to find out if it is really that small in real life.

It's not hard to portray the Earth's surface curved as long as the area it covers is small dimensions. To draw maps of countries, continents or the entire planet is a bit more complicated, so a map projection is needed.

Map projections are flat representations of a world that is spherical, and even though there are multiple projections, we can classify them in three groups: cylindrical, conic and azimuthal.

Cylindrical projections are most widely used to draw planispheres and maps of countries. They are made from the projection of the parallels and meridians onto an imaginary cylinder that wraps the globe, and is placed in such a way that the parallel that makes contact is the equator. It was developed in the 16th century by the Dutch Gerhard Kremer, also known as Mercator (Fig. 1.23).

Conic projections transfer the geographical network of meridians and parallels from the globe to a cone, which is then unfolded to create a flat map. A complete conic projection is only a segment of a circle. It is widely used to represent medium and high latitudes. Conic projections are especially useful to map small areas (Fig. 1.24).

Azimuthal projections are the oldest map projections. Distances and directions are true only from the center point, thus resulting in the center being the least distorted. The most important feature of azimuthal projections is that all directions departing from the center of the projection are accurate with regards to the center point, and all points are equidistant (Fig. 1.25).

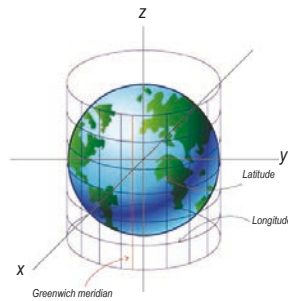


FIG. 1.23 Cylindrical projection

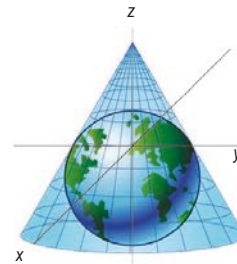


FIG. 1.24 Conic projection of Earth.



FIG. 1.25 Azimuthal projection of Earth.

→ Expected Learning

Compare the different representations of Earth's surface through map projections.

SESSION INFORMATION

Week: 5

Session: 17

Expected learning outcome: Compare the different representations of Earth's surface through map projections.

CONTENT DELIVERY

Start: In pairs, students should answer the questions in the section *How much do you know?* Elicit answers in whole class.

Development: Ask students to look at the pictures on the page and see the name of each projection. Ask them to describe them (in trios). Elicit descriptions. Then, they should read the information in the page.

Closing: Students should make a synoptic table.

Homework: Students will need a device with Internet access in order to complete a task.

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SKILLS DEVELOPMENT

Critical thinking skills: Predicting.

Visual/Spatial skills: Looking and discussing, charting.

EVALUATION OF CONTENT

Check students' synoptic tables.

SESSION INFORMATION

Week: 5

Session: 18

Expected learning outcome: Compare the different representations of Earth's surface through map projections.

CONTENT DELIVERY

Start: Students should read pages 28 and 29. Help with vocabulary as necessary. Ask some comprehension-check questions about the information they read.

Development: With access to the Internet, students should complete the table on page 28 in pairs.

Closing: Check the table in whole class.

GLOSSARY

Loxodromic. Is a line crossing all meridians of longitude at the same angle.

The Use of Mercator, Peters and Robinson Projections

Throughout history, countless different map projections have been created.

The main goal of a projection is to find the most adequate representation of the functionality of the desired map.

Before the Renaissance, only a dozen map projections were known, and in the two following centuries they were developed and improved in order to reduce the distortion on maps.

Mercator brought to the world a projection of a unique map where every projected straight line is **loxodromic**, which makes the direction accurate and real. On Mercator projections, the longitudes are real along the equator and reasonably correct up to 15°. This proved excellent for navigation because it allowed sailors to trace routes easily, making it a very popular projection.

In the 1970s, Arno **Peters** picked up Gall's map projection and improved it. In a Gall-Peters projection, meridians appear as parallel vertical lines and the distance between parallels shortens as it approaches the poles, making it possible to follow exact paths on a projection with the help of a compass.

In 1961, Arthur H. **Robinson** developed a similar projection to those of Mercator and the result was a pseudo-cylindrical projection, where the central parallel, usually the equator and a central meridian, cross in a right angle in the center of the map. At this intersection, the projection doesn't have any distortion. However, the distortion increases as we approach the edge of the map.

Apply your knowledge

Complete the following table on map projections and their main uses with the help of the Internet:

Projection	Cylindrical	Conic	Azimuthal	Other	Loxodromic	Non loxodromic	Global	Regional	Local	Geologic and topographic	Navigation	Thematic and presentations
Mercator	X				X			X			X	
Gall-Peters	X					X	X	X				X
Robinson				X	X		X			X		X

The Implications of Representing the World in Mercator, Peters and Robinson Maps

The choice of projection depends on what we wish to portray on the map. We must not forget that all projections face the problem of converting a three dimensional object into flat surface (a map), resulting in distortion, specially when a large territory or the planet as a whole needs to be portrayed.

The Mercator projection represents Earth in its entirety but the larger areas get distorted as they move away from the equator. A clear example of this deformation can be seen with the island of Greenland, which seems to be larger than India, Australia, Mexico or South America. The US and Canada also

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SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Applying information.

EVALUATION OF CONTENT

Check students' tables.

seem bigger than South America on this map, but it is completely the opposite.

The Mercator projection tends to represent landmasses in the northern hemisphere and the equator too far south, not in the center of the map, which is why two thirds of the map are portrayed in the North and only a third is in the South.

One of the projections that tries to portray the areas with the most accuracy is that of Arno Peters. According to a Peters' projection, the continents and oceans are shown in their real size, even the high latitudes

of 90°, which allows us to make exact comparisons.

The Robinson projection (Map 1.6) was created with the sole purpose of finding a consensus to the issue of portraying the globe in its entirety on a flat surface. And even though the meridians slightly curve, avoiding the opposite sides, at the same time it "stretches" the poles in long lines instead of portraying them as points. The Robinson projection has a better balance between the size and shape of high latitudes lands. Russia and Canada are portrayed in their actual size even though Greenland looks compressed.

Curious Fact

In this website you will find a wide variety of online maps, from old projections to the most recent and up-to-date versions. <http://www.lib.utexas.edu/maps/index.html>



MAP 1.6 Robinson projection.

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SESSION INFORMATION

Week: 5

Session: 19

Expected learning outcome: Compare the different representations of Earth's surface through map projections.

CONTENT DELIVERY

Start: Students should read pages 28 and 29. Help with vocabulary as necessary. Ask some comprehension-check questions about the information they read.

Development: With access to the Internet, students should complete the table on page 28 in pairs.

Closing: Check the table in whole class.

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Applying information.

EVALUATION OF CONTENT

Check students' tables.

SESSION INFORMATION

Week: 5

Session: 20

Expected learning outcome: Compare the different representations of Earth's surface through map projections.

CONTENT DELIVERY

Start: Students should work in three teams. Ask them to describe the Mercator, Peters and Robinson projections. Elicit in whole class.

Development: Students should complete the chart and answer the questions below the chart.

Closing: Check teams' charts in order to complete all the information with each team's answers.

How much did I learn?

Analyze the three projections in teams: Mercator, Peters and Robinson's.

Projection	Greenland	Alaska	Mexico	South America	India	Scandinavian Peninsula	Europe	Northern hemisphere	Southern hemisphere	North Pole	South Pole
Mercator	It is the same size as Africa	Much larger than South America and Mexico	Looks smaller than Alaska	Looks the same size as Greenland and smaller than Europe	Looks smaller than Greenland	It is made too broad in its northern end	It looks larger than it actually is	It is distorted and it looks much larger	It is reduced almost a third its size.	"Huge" compared to its actual size	It is "huge" compared to its actual size
Peters	It looks larger than its actual size	Looks larger than Mexico	It looks l	It looks larger than Europe	It looks larger than that it size	It looks smaller than it really is	It shrinks significantly to its real size	Truer representation in terms of extension	It has a smaller size than in reality	It has large distortions	It has a considerable dimension
Robinson	Appears more shrunken and compressed	It looks compressed	Looks larger than India	It looks larger than Greenland	It looks smaller than what it actually is	It looks larger than it actually is	It looks smaller	It looks fattened and stretched	It looks flattened and stretched	The poles are "stretched" like big lines	The South pole is "stretched" like a big line

With your teacher's guidance, comment on the following questions:

- What projection shows a more realistic portrayal of the globe?
- What other regions of the world, besides those you observed, appear distorted?
- What territories are the vastest in the Peters' projection?

- To what do you attribute the deformity of maps?

- Compare the Mercator and Peters' projections using a globe and determine what zones are more similar to one another. Write them down in your notebook

Under the supervision of your teacher, write down your conclusions on the blackboard.

Kells

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SKILLS DEVELOPMENT

Critical thinking skills: Applying information.

EVALUATION OF CONTENT

Check students' complete tables.

Satellite Images. Global Positioning System and Geographic Information Systems

How much do you know?

Look at the following images and answer in your notebook:

- Compare and name at least three differences between them.
- Analyze and explain what the main reason for the differences is.
- If it is the same space, explain why the image is different.

Aerial photography is an essential tool in cartography that has helped with spatial analysis. It originated at about the same time as the invention of the airplane and consists of achieving a series of photographs taken at a specific height (Figs. 1.26-1.30) that portray detailed images of Earth's surface in black and white or in color. These photographs made possible the development of reliable and precise maps of vegetation coverage, urban growth, the evaluation of natural disasters, as well as to trace roadways. However, with time, photographs lose clarity. Since the launching of the first artificial satellite, a solution to part of this problem was found. Satellite images allow for the **remote sensing** of underground water bodies, fuel deposits, hurricane behavior and the creation of highly precise maps (Fig. 1.31). Each satellite photograph provides information on a section of Earth's surface at a specific moment and under certain circumstances, which turns them into a powerful tool, essential in making maps (Fig. 1.32).



FIG. 1.26 Aerial photo



FIG. 1.27 Aerial photo



FIG. 1.28 Aerial photo



FIG. 1.29 Aerial photo



FIG. 1.30 Aerial photo

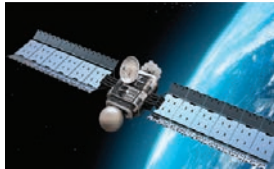


FIG. 1.31 Satellite in orbit



FIG. 1.32 Satellite photo

→ Expected Learning

Learn to recognize the use of satellite images, the global positioning system and the geographical information systems.

GLOSSARY

Remote sensing. The process through which information is acquired about an object without being in direct contact with it.

SESSION INFORMATION

Week: 6

Session: 21

Expected learning outcome: Learn to recognize the use of satellite images, the global positioning system and the geographical information systems.

CONTENT DELIVERY

Start: Students should answer the questions in the section *How much do you know?* Elicit answers in whole class.

Development: Ask students to summarize the information in both pages 31 and 32.

Closing: Check students' summaries.

Homework: Organize teams. Every team should take to the following sessions: A photo of a topographic map or chart from INEGI from any area in Mexico, vellum paper or any other paper that is semitransparent. Students should also get a device with Internet access.

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SKILLS DEVELOPMENT

Interpersonal skills: Working as team members.

Critical thinking skills: Summarizing.

EVALUATION OF CONTENT

Check students' summaries.

SESSION INFORMATION

Week: 6

Sessions: 22 - 24

Expected learning outcome: Learn to recognize the use of satellite images, the global positioning system and the geographical information systems.

CONTENT DELIVERY

Start: In teams, students should do the projects and research explained in the sections *Apply your Knowledge* and *How much did I learn?* in class.

Development: Students will present their projects and research.

Closing: Check students' information and projects. It's important that students prepare the unit final project before hand. Have them read it. Explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work and language use.

Elements of Geographical Space on Satellite and Aerial Images, Global Positioning System, Geographical Information Systems and How to Use Them

The elements of geographical space can be mapped thanks to the development of computer programs and the rapid surge of technology.

Satellite images can be then used in geology, meteorology, ecology, agriculture, and can point out erosion zones, soil, rivers and sea pollution, volcanic activity, etc.

The Global Positioning System's (GPS) goal is to accurately establish the geographical coordinates of a point, a line or an area on the surface of the

planet. This device is called GPS and some cell phones have it integrated.

At present, a powerful tool called GIS (Geographical Information System) integrates different types and sets of data to create a projection based on the overlay of maps. This digital mapping system can create high quality maps in different types of scales and link them easily with natural, social and economic components that lead to analysis, visualization and reference.

Apply your knowledge

For this activity you will need sheets of vellum paper or any other that is semitransparent.

A photo of a topographic map or chart from the INEGI of any area of Mexico.

- Copy the contour lines from the topographic map (the lines that link three points of the same height) on the vellum paper.
- Trace all other hydrographic elements on another sheet of paper.
- Mark off the colors that indicate the different types of vegetation on another sheet of paper.

Overlap your sheets of paper and look at them against a source light.

- In your notebook, explain what difficulties you encountered when making the map.
- Write down a list of all the elements on the map that can be portrayed on a GIS.
- Analyze and write the advantages and disadvantages of this type of map.
- Share your answers with the rest of your group and write the conclusions on the blackboard.

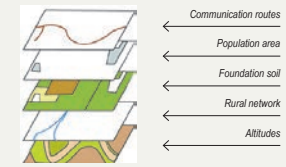


FIG. 1.33 Topographical scheme

How much did I learn?

- Research an application on the use of geographical information on the Internet different from the ones mentioned and document it in your notebook.
- Share your findings with the group and exchange the different uses that this information has.
- Based on your textbook, reflect on the importance and the need that governments and companies have for geographical information systems.
- Make a list of the benefits that result from the use of this technology. Share it with your classmates.

32

SKILLS DEVELOPMENT

Interpersonal skills: Working as team members.

Critical thinking skills: Selecting data, sequencing, organizing information.

EVALUATION OF CONTENT

Check students' information and projects.

Project

Cyclones and Hurricanes

The project in Unit 1 is aimed at studying the problem of cyclones and hurricanes in certain tropical areas. Do you know why these meteorological events are dangerous? Have you heard of the consequences of these events in the affected zones? Have you gone through that situation in your community?

Read the information below carefully:

Exchange of ideas

Before starting, we must take into consideration that projects are a series of activities geared towards answering a question, proposing solutions to a problem or designing a product that conveys the results of the researched subject. In order to carry out your project, you must always combine your knowledge with your abilities in different areas. The work

that you carry out will allow you to integrate what you have studied throughout the unit. In light of this, consider the following activities:

- An analysis of the geographical information to identify the situation or problem.
- Locate risk zones on a map.
- Research sufficient information to have a complete picture of the problem

(hydrometeorological risks).

- Display the geographical information of the situation being studied.
- Present your project's results and conclusions.

Work in teams and discuss some of the predicaments that interest you, create a list and select those that affect your community.

→ Reading

Tropical Cyclones and Hurricanes in Mexico (a Spatial Regional Analysis)

In Mexico, the most intense cyclones are known as hurricanes; they are classified among the most destructive of natural disasters, causing great damage to coastal populations, human loss, agricultural production, infrastructure and other sectors of the national economy.

The energy of tropical cyclones comes essentially from heat and moisture that the ocean transfers to air levels in the lower atmosphere. When the center of the cyclone is over warm water (higher than 26°C), the energy level is enormous. Generally, its diameter is about a few hundred kilometers, with strong winds

and torrential rains, sometimes accompanied by thunderstorms. In the ocean, human activities at risk are mainly oil installations, ships and air traffic. On land, towns and villages, industries, roads and crops that are along the path of the tropical cyclone are threatened. The greatest impacts of a tropical cyclone are storm surges at landfall, strong winds and heavy rains. For example, Hurricane Gilberto (September 1988) is considered in meteorological circles as the "Cyclone of the Century." Its winds were estimated at 282 km/h.



Source: ICYT. *Información Científica y Tecnológica, Consejo Nacional de Ciencia y Tecnología*, vol.11, N. 155, August 1989.

Kells

33

SESSION INFORMATION

Week: 7

Sessions: 25, 26

Expected learning outcome: Students will apply information of the unit to develop and present a project.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, the comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask their 5 comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

SESSION INFORMATION

Week: 7

Sessions: 27, 28

Expected learning outcome: Apply information of the unit to develop and present a project.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, the comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask their 5 comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

Project

Project Development

Use the following questions to start developing your project on cyclones and hurricanes:

1. To what type of geographical space does the subject belong to?
2. What special characteristics of analysis does it have?
3. If it can be represented on maps, where would the risk zones be located? What effects does the phenomenon have on the population?
4. What are its consequences?
5. How can the effects of the predicament be prevented? Do the authorities provide care?
6. What can you do to solve it?

Definition of Sources of Information, Activities and Products

You may rely on the following sources and instances to look up information:

- Topographical maps (You may look them up at <http://www.inegi.gob.mx>).
- Political maps to determine what areas are the most affected.
- Newspaper and magazine articles, books, the Internet, etc.
- Direct observation of the problem.
- Statistical information from the governments, like the Ministry of Economy, the Department of Natural Resources and the Environment, the National Committee of Water, etc.

Monitoring Activities and Elaboration of Various Products

At the same time, check sketches, blueprints, and various scaled maps of the place and if possible, aerial and satellite photos to include in your work.

With your teammates compare information, analyze results and check if you accomplished the aims of your project:

- Does it describe the predicament you have studied?
- Does it mention the location of the affected towns?
- Does it include a representation of the geographical space of the problem?
- Make sure the information answers the questions you posed at the beginning. If needed, use maps, graphs, posters or any other material to illustrate your work.

Presentation of the Final Product and Evaluation

Each team will present their findings through an oral presentation, a debate, an exposition, a conference, a roundtable discussion, etc., emphasizing the solutions they reached as a team.

Present the project to the school community and parents. To evaluate your project, request feedback from your teacher, classmates and community in general.

34

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Evaluation

What I have learned

Read the following questions carefully and answer them.

- Name two types of natural components of geographical space.
Physical natural components: Topography, climate, water, soil and subsoil.
Biological natural components: vegetation and fauna.
- The place, environment, landscape, region and territory are categories of geographical space. Describe a landscape of your city.
Students' own answers.
- What is the use of numerical scales on maps?
The use of numerical scales allows to portray differences, similarities and relationships between geographic spaces.
- What is the use of time zones?
To coordinate and establish a universal and standardized system for the use of time.
- Name three types of map projections that you learned in this unit.
Three types of map projections are: Azimuthal, Cylindrical and Conic.
- How are satellite images and Global Positioning Systems useful?
They help with spatial analysis. They are used in geology, meteorology, ecology, agriculture, etc.

Self-Evaluation

Read through each of the assessment points and indicate the level you have reached.

Assessment point	I do it very well	I have a hard time doing it	I need help doing it
I can identify the diversity of the components of the geographical space.			
I can distinguish the categories of spatial analysis: place, environment, landscape, region and territory.			
I understand the use of numerical and graphic scales for maps.			
I can locate places and time zones on maps based on geographical coordinates.			

Peer-Evaluation

Work in pairs and comment about your achievements.

Assessment point	I do it very well	I have a hard time doing it	I need help doing it
I can compare different representations of Earth's surface through cartographic materials.			
I understand the use of satellite images, GPS and Geographical Information Systems.			

SESSION INFORMATION

Week: 8

Sessions: 29 - 32

EVALUATION AND SELF EVALUATION

CONTENT DELIVERY

Start: Students should answer page 35 (Evaluation) prior to taking the unit assessment. Go through the answers; help them with techniques to study content they do not clearly remember.

Development: Students are to take the unit assessment. You can find it in the Teacher's Guide pages 146 and 147 along with the answer key on page 148.

Closing: Check their assessments, record the score and provide with feedback. You might want to use the Attendance and Evaluation formats that you can find the Teacher's Guide pages 166 to 167.

35

SKILLS DEVELOPMENT

Metacognitive skills: Self-monitoring, self-evaluating learning outcome.

EVALUATION OF CONTENT

Students should complete both, the evaluation and self-evaluation instruments prior to taking the unit assessment.

Student book U2

SESSION INFORMATION

Week: 9

Session: 33

Expected learning outcome: Identify topics in the unit students consider will be hard to understand in order to make a study plan.

CONTENT DELIVERY

Start: Have students analyze and identify what they could do well in units 1; as well as what they should improve in unit 2. Ask them, for instance: What topics were easy? Did your previous study plan work? Didn't it work? Why? Did you really follow your study plan? Students should write down their reflections.

Development: Have students check the skills, learning outcomes and key concepts in unit 2. Ask them to identify the topics they consider the hardest ones. Then, they should plan how to study them and do better than the previous unit. If a strategy didn't work, then they should find another one. Help them with ideas. (Drawing mind maps, discussing with partners, making their own exams, making timelines, making associations, etc.)

Closing: Students should write down their study plan and have it checked.

UNIT 2 Earth's Natural Diversity

Skills

- Learn to recognize Earth's natural diversity

Expected Learning

- Relate the distribution of seismic and volcanic regions of the world and Mexico to Earth's tectonic plates
- Identify the structure and distribution of continental and oceanic topography around the world and in Mexico based on Earth's internal and external dynamics
- Learn to differentiate between the importance of the distribution, composition and dynamics of ocean and continental waters around the world and in Mexico
- Learn to differentiate between the importance of water uptake in basins as well as the water availability around the world and in Mexico
- Connect elements and factors of the different types of climates around the world and in Mexico
- Learn to recognize the importance of the geographical conditions that favor biodiversity around the world and in Mexico

Project
The Natural Components of Geographical Space

Evaluation

36

Kells

SKILLS DEVELOPMENT

Metacognitive skills: Planning, organizing studies content.

EVALUATION OF CONTENT

Students should get their study plan checked by the teacher.

Dynamics of Earth's Inner Layers

How much do you know?

Read the following questions and answer them in your notebook.

- How many layers of crust with different characteristics are there from Earth's surface to its center?
- Have you ever seen a volcanic eruption or felt an earthquake? Discuss your answers with your teacher and classmates.

For centuries, mankind has been asking itself what the interior of the planet is made of. In the last decades, there have been more attempts to understand with greater precision what the components, forms and dynamics of Earth's interior are. One of the methods is through excavations; however, these have not reached more than 12,000 m in depth.

Nowadays we know that Earth's interior is divided in several layers: a solid inner core, an outer liquid core, a mantle and the crust. All of these are part of a complex system that interacts with its parts in a complex manner (Fig. 2.1).

Due to its composition, the **core** has a close relationship with the rest of the planet's layers: it acts as a sort of magnet that prevents the rest of the layers from flying off into space.

The **outer core**, made from molten metals, has a higher density than that of the exterior elements but with similar characteristics. As it rotates, this liquid sphere creates a series of movements and disruptions in its rotation, which creates decoupling. These disruptions eventually turn into strong electrical currents that generate Earth's magnetic field (geomagnetic field). Earth's external layers create magnetic rings in the shape of a shield that protect the planet from collisions with solar winds and other solar and stellar particles. In between the inner and outer core there is a transition zone called the Lehmann **discontinuity**.

The **mantle** is found around the external core and is divided into two parts: the lower mantle and the upper mantle, also called **asthenosphere** and made up of **magma**. The lower mantle is primarily composed of iron and magnesium silicates and the upper one of iron and aluminum silicates. This composition results in the asthenosphere and the lower mantle having different temperatures and therefore acts as viscous

fluid in which **convective currents** are formed, displacing the hot material in the interior towards the surface due to the high temperatures. When this material is near the crust, it 'cools down' and descends back to the inferior levels, heating itself up once more and repeating the 'cycle' (Fig. 2.2).

Earth's crust, also known as the **lithosphere**, is made up of rocks. Its thickness varies from 8 to 50 km, making it quite thin. It is primarily made up of elements such as silicon, oxygen, aluminum, magnesium, iron, sodium, potassium and calcium. It can be divided in two parts: the continental mantle and the ocean mantle.

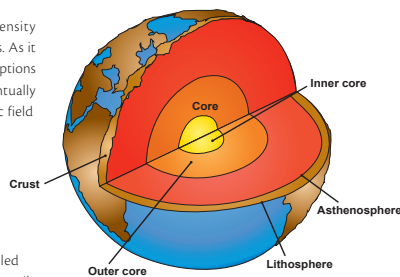


FIG. 2.1 Earth's interior.

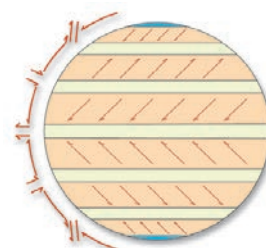


FIG. 2.2 Convection currents in the external mantle of Earth's crust.

→ Expected Learning

Relate the distribution of seismic and volcanic regions around the world and Mexico to Earth's tectonic plates.

GLOSSARY

Discontinuity. A change of specific properties and characteristics for each layer of the Earth.

Magma. Melted rock found in the asthenosphere or upper mantle of the planet.

Convective currents. Ascending and descending currents of various types of materials (they are caused by the differences in temperature). They are also called convection currents.

SESSION INFORMATION

Week: 9

Session: 33

Expected learning outcome: Relate the distribution of seismic and volcanic regions around the world and Mexico to Earth's tectonic plates.

CONTENT DELIVERY

Start: Ask the two questions in the section *How much do you know?* In whole class. Write down the predictions students give on the number of layers Earth has.

Development: Have students read the page. Help with vocabulary as necessary. Ask them to look at the picture 2.1 and explain what each part of the Earth's layers is in a synoptic table. Help them out with one or two definitions so they can continue with the rest.

Closing: Check students' synoptic tables.

Homework: Students should do research on the approximate temperature of each of the inner layers of Earth.

Extra project: Make a model of the Earth's layers.

37

SKILLS DEVELOPMENT

Critical thinking skills: Predicting, looking, and discussing.

Visual/Spatial skills: Charting.

EVALUATION OF CONTENT

Check students' charts.

SESSION INFORMATION

Week: 9

Session: 34

Expected learning outcome: Relate the distribution of seismic and volcanic regions around the world and Mexico to Earth's tectonic plates.

CONTENT DELIVERY

Start: Ask students for their research. Elicit answers and have some students write the approximate temperatures on the board.

Development: Students should complete the section *Apply your knowledge* with information from the previous page and the research they did. Elicit in whole class.

Closing: Have students analyze the relation between the temperature of each of the inner layers and earthquakes. Discuss it in whole class.

Homework: Students should take a world map and an Atlas.

GLOSSARY

Analogy. Relation or similarity between two different things.

Earth is a great system whose internal and external elements are in constant movement. In general terms, it is broken up much like a puzzle and has been in constant change and movement since its formation due to the convective currents of its mantle. Understanding the dynamics of

the movements of Earth's interior leads to a greater understanding of said forces and their instability and impact on the lithosphere. When they find an opening, the concentrated energy from the interior manifests itself in phenomena such as volcanism and seismicity.

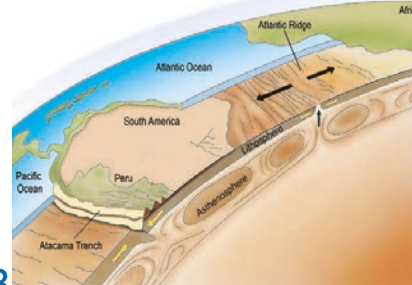
Apply your knowledge

Complete the following table with the information you have been given about the dynamics of Earth's layers, the available information and what is asked of you in the research:

Name	Divisions	Internal Structure (Inner-Outer)	Thickness (km)	Temperature	Physical composition and state
Core	Internal core	It is mostly solid	1200 km thick	5430°C	Iron-Solid Nickel
	Outer core	It borders the mantle, it forms an iron and nickel alloy	2300 km thick	4400°C to 6100°C	Iron and nickel
Crust	Lithosphere	Towards the internal part it adjoins with the outer core; towards the exterior, with the asthenosphere.	8 to 50 km thick	200 °C to 400 °C	Silicon, oxygen, aluminum, magnesium, iron, sodium, potassium and calcium
	Asthenosphere	Its motion is the cause of plate tectonics The lower mantle is denser and hotter	700 km	1400°C to 3000°C	Magma, in liquid state
Mantle	The lower and the upper mantle	The upper mantle is below the asthenosphere, it is more solid and stronger	2,900 km	500°C to 900 °C	Iron, magnesium and aluminum silicates

- Research the approximate temperature of each of the inner layers and place them in the corresponding column.
- Analyze the relationship between the temperature of each of the inner layers and earthquakes. Share your answers with the group.

FIG. 2.3 Tectonic plates of the Atlantic.



38

Location of Earth's Tectonic Plates on Maps

The theory of Plate Tectonics sustains that Earth's crust is fragmented in blocks that fit each other perfectly; they are made up of rocks that have floated over magma for billions of years. Imagine Earth as a great puzzle made up of segments that correspond to tectonic plates (Fig. 2.3). The **analogy** of tectonic plates and pieces of a puzzle will allow you to imagine that a tectonic plate is a big rigid block of irregular contours that moves due to the mantle's convective currents, or asthenosphere. These movements cause pressure changes and therefore different types of boundaries, that are: divergent, convergent or transform boundaries.

Divergent boundaries occur: when two tectonic plates separate from each other, the magma rises from the asthenosphere and forms a new ocean mantle (or ground). This magma is deposited on the edges of the plates and pushes them in opposite directions, thus accounting for their displacement. These places are known as divergent or constructive boundaries, because when they cool down they contribute to the formation of great mountain

Kells

SKILLS DEVELOPMENT

Metacognitive skills: Doing research, discriminating information.

Critical thinking skills: Summarizing.

EVALUATION OF CONTENT

Students should have done research in order to complete the chart, check it. Students should get their table checked by the teacher.

ranges or ridges at the edges of the plates. The Atlantic ridge is the result of magma ascending and **solidifying** in the area where the Eurasian, North American, South American and African plates diverge.

Convergent boundaries occur when a tectonic plate sinks below another more resistant one, thus melting back with the asthenosphere. Besides causing great seismicity in the zones where tectonic plates make contact, the subduction also creates coastal mountain ranges, volcanoes and **trenches**.

Transform boundaries are areas that are in contact with continental plates, where horizontal or lateral movements predominate. In these places the lithosphere is not created or destroyed, but the movement does cause friction that gives off energy, causing strong earthquakes.

According to their dimensions there are major and minor plates. Among the major plates are: the Pacific, the North American, the South American, the Nazca, the Eurasian, the African, The Indo-Australian and the Antarctic;

among the minor ones are: the Cocos, the Caribbean, the Juan de Fuca, the Scottish, The Arabic, the Philippines, The Fiji, The Carolinas. Other minor local ones exist as well. Small plates are the most unstable ones, and their movements frequently cause earthquakes. As they move across the asthenosphere, tectonic plates cause strong friction along their edges, this mechanism is known as tectonics. Tectonic plates are responsible for the creation of new forms in the continental and submarine topography of Earth's crust (Map 2.1). They are also the cause of two processes that occur frequently: seismicity and volcanism.

The movement of the plates not only causes earthquakes, but it also gives off energy and materials that emerge from Earth's interior through cracks and crevices, up to the surface, known as volcanism. Earthquakes are vibratory movements of Earth's crust that propagate as waves; their origin is tectonic and volcanic (Fig. 2.4).

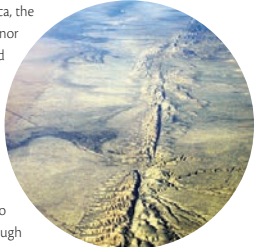
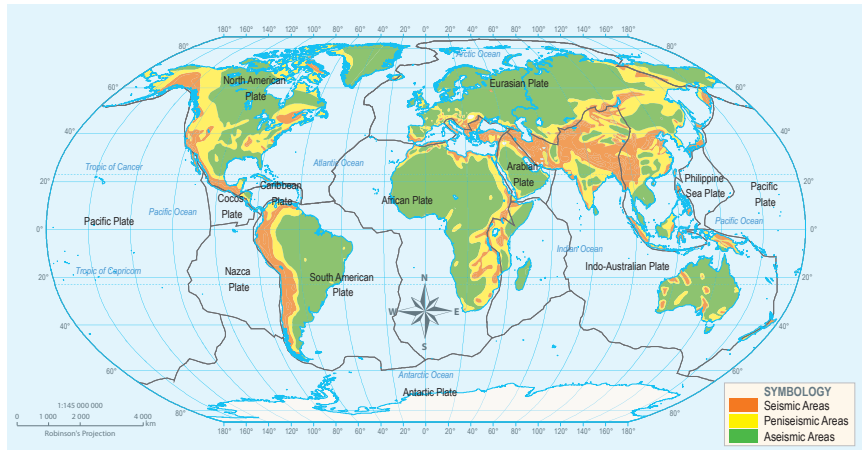


FIG. 2.4 Fault line.



GLOSSARY
Solidify. To turn a liquid into a solid. In this case, rocks.
Trench. Very deep marine ditch.

To Learn More
 There are three types of Convergent boundaries occur or collision between plates: a. oceanic-continental, b. oceanic-oceanic, and c. continental-continental.

MAP 2.1 Tectonic plates of the world. SOURCE: Eduardo Pérez Torres, *Geografía de México y del Mundo*, Esfinge, 2008.

SESSION INFORMATION

Week: 9
Session: 34
Expected learning outcome: Relate the distribution of seismic and volcanic regions around the world and Mexico to Earth's tectonic plates.

CONTENT DELIVERY

Start: Students should cut their world map according to the lines shown in the map 2.1. (Indicating the borders of the tectonic plates). Ask them how they imagine those "pieces" intervene in earthquakes. Elicit answers.

Development: Students should read *Location of Earth's Tectonic Plates on Maps* that starts on page 38 and continues on page 39. Help with vocabulary as necessary. Ask them to find definitions of Divergent Boundaries, Convergent boundaries and Transform boundaries. Have students write them on the board. Then, ask them to take their map pieces and do each movement. Elicit volunteers to show how each movement occurs.

Closing: In teams of three or four members, students should complete the chart on page 40 using the previous information and an Atlas.

Homework: Ask students to get a world map the following session.

SKILLS DEVELOPMENT

Critical thinking skills: Defining concepts, summarizing.

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Check students' maps and charts.

SESSION INFORMATION

Week: 9

Session: 35

Expected learning outcome: Relate the distribution of seismic and volcanic regions around the world and Mexico to Earth's tectonic plates.

CONTENT DELIVERY

Start: Students should read *Distribution of Earth's Seismic and Volcanic Regions*. Help with vocabulary as necessary. Ask comprehension-check questions.

Development: Then, they should look at the map on page 41 and paint their world map indicating where the seismic and volcanic regions are.

Closing: Students should also label each seismic and volcanic region.

Extra project: Building a volcano model; showing how magma and tectonic plates interact. Students might even ask their chemistry teacher how they can simulate a volcanic explosion to see how the tectonic plates move.

Homework: Students should get a piece of cardboard, markers and ruler.

GLOSSARY

Earthquake. Vibrational movement of Earth's crust.

Igneous. Material from magma or an incandescent body.

Apply your knowledge

Work in groups of three and draw a table like the one below in your notebook and locate on Map 2.1 of tectonic plates or in an atlas, which plates are found in the countries that appear in the table. Once you have finished, write down the plates that adjoin them in the corresponding column.

Country	Tectonic plate(s) to which it belongs	Tectonic plate it adjoins	Important earthquakes registered in the last 100 year
Mexico			
Somalia			
Chile			
Japan			

- On the Internet, look up important earthquakes registered in the last 100 years in the countries that make up the list.

Seismic and Volcanic Zones Table	
Mediterranean Ring of Fire	Asia-Mediterranean zone. Volcanoes such as the Vesuvius (Italy) and seismic zones from the oriental Alps to Turkey, Central Asia (Himalaya) and Indonesia.
Pacific Ring of Fire	60% of the world's volcanoes are found here. It begins in the Andes and extends throughout the Pacific, passing through the volcanoes of Katmai (Alaska), Fujiyama (Japan), Guallatiri (Bolivia-Chile) and St. Helens (USA).
Indian Plate	Adjoins the ring of fire of the Pacific, Indonesia, Sumatra and Java.
African Zone	From Mozambique to Turkey, with volcanoes such as Kilimanjaro, Meru, Kenya and Nyiragongo.
Atlantic Zone	Helda and Laki (Iceland) volcanoes.

TABLE 2.1

Distribution of Earth's Seismic and Volcanic Regions

The areas of the world with the highest risk of **earthquakes** are those located at the meeting point of two plates. They take place in zones of tectonic and volcanic activity, collapse zones and where artificial earthquakes take place (due to the detonation of explosives on Earth's crust) (Table 2.1). There are three types of zones according to the frequency with which earthquakes occur: **aseismic**, where no earthquakes are usually registered; **peniseismic**, where earthquakes scarcely occur; and **seismic**, where frequent and intense earthquakes take place because they are on the border of the tectonic plates (Map 2.2).

Volcanism can also result from the movement of tectonic plates, convective currents of magma in the asthenosphere; from the instability of rocks that make up Earth's crust in its deepest area, which gives off so much accumulated energy in the form of an explosion; from **igneous** materials that are expelled in the form of lava that solidifies into rocks, along with ashes, pyroclastic material, gases and water vapor.

It is estimated that Earth has five zones with the maximum amount of volcanic and seismic activity: the Pacific Ring of Fire, the Mediterranean Ring of Fire, and the Indian, Atlantic and African zones. These zones present great and imminent risk due to their location in the borders of the plates. Analyze Map 2.2 of the seismic and volcanic zones of the world and discuss with your group.

Kells

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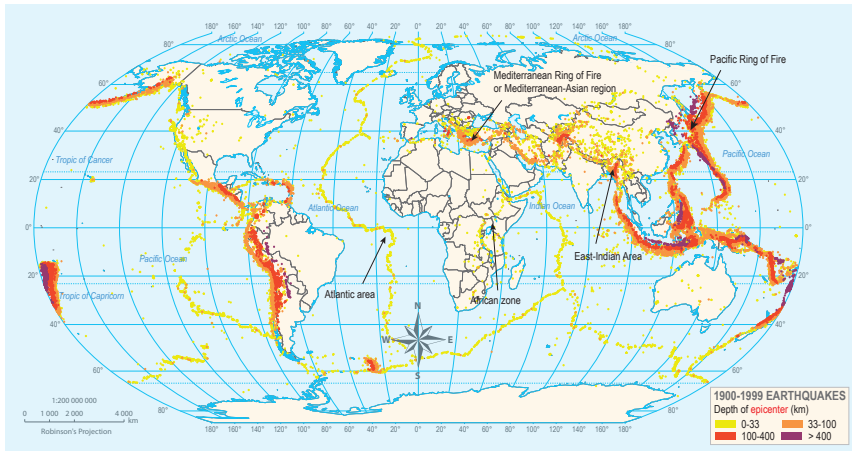
SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Visual/Spatial skills: Locating places in a map.

EVALUATION OF CONTENT

Students should get their map checked by the teacher.

**GLOSSARY**

Richter scale. Measures earthquakes on nine levels, from imperceptible movements up to the strongest ones.

MAP 2.2 Seismic zones and continental boundaries.

SOURCE: Compilation based on www.visionlearning.com

To Learn More

In the following webpages, you will find a list of the volcanoes of the world. <http://www.volcano.si.edu/world/>
http://redescolar.ilce.edu.mx/redescolar/publicaciones/publi_volcanes/

SESSION INFORMATION

Week: 9

Session: 36

Expected learning outcome: Relate the distribution of seismic and volcanic regions around the world and Mexico to Earth's tectonic plates.

CONTENT DELIVERY

Start: Students should read pages 41 and 42. Help with vocabulary as necessary. In pairs, students should write seven comprehension-check questions about the content in both pages. Check their questions.

Development: They should exchange notebooks to answer each other's questions.

Closing: Students should make an informative poster for a preventive campaign explaining why it is important to be prepared for earthquakes since Mexico is situated in the middle of a seismic and volcanic zone. They should include risk reasons, risk zones and preventive actions.

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Seismicity and Volcanism in Mexico

Mexico is one of the most affected countries by seismic movements because it has several faults: the movement of two major plates and three minor ones, and a strip of volcanoes that crosses it from coast to coast. It is considered one of the zones with the highest telluric activity in the world. The most imperceptible and frequent movements as well as those that reach a magnitude of 7 on the **Richter scale**. According to statistical data, it is one of the countries where more than 90 earthquakes are registered per year as having a higher magnitude than 4 on the Richter scale, which equates to 60% of all the ones in the world. Mexico is located on top of two major plates: the North American plate, and the Pacific

plate. In addition the Rivera and Cocos plates as well the Caribbean plate.

The clashing of these plates has caused a system of fault lines that are located along the 19° parallel, which give rise to the Transversal Volcanic System and is the continuation of the San Andreas system, which cuts across the Baja California Peninsula, and along it there are numerous volcanic edifices located in Nayarit, Colima, Jalisco, Mexico, Puebla, Michoacan, Tlaxcala and Veracruz (Map 2.3). However, not all of Mexico is located on a seismic zone. The zones that differentiate the frequency and intensity of the seismic activity are:

SKILLS DEVELOPMENT

Critical thinking skills: Formulating questions, summarizing.

Humanistic skills: Caring for others.

Intrapersonal skills: Developing civic awareness.

EVALUATION OF CONTENT

Students should get their questionnaire and poster checked by the teacher.

SESSION INFORMATION

Week: 9

Session: 36

Expected learning outcome: Relate the distribution of seismic and volcanic regions around the world and Mexico to Earth's tectonic plates.

CONTENT DELIVERY

Start: Students should read pages 41 and 42. Help with vocabulary as necessary. In pairs, students should write seven comprehension-check questions about the content in both pages. Check their questions.

Development: They should exchange notebooks to answer each other's questions.

Closing: Students should make an informative poster for a preventive campaign explaining why it is important to be prepared for earthquakes since Mexico is situated in the middle of a seismic and volcanic zone. They should include risk reasons, risk zones and preventive actions.

Homework 1: Students should choose a country that is located on a seismic or volcanic zone and do research on the topics described on top of page 43, in the section *How much did I learn?* They should present their research report the following day.

Homework 2: Students should do research on the type of topography their city has.

To Learn More

In the following link you will locate and find out the magnitude of the latest earthquakes. Don't forget to click on a specific point to enlarge the image. <http://www.iris.edu/seismon/>

MAP 2.3 Aseismic, peniseismic and seismic zones of Mexico.
SOURCE: Atlas de geografía de México, SEP, 2010.



To Learn More

Visit the webpage of the National Seismological System (Sistema Sismológico Nacional), where you will find information on the latest earthquakes. <http://www.ssn.unam.mx/webseite/jsp/ultimos.jsp>

Aseismic zone is the zone where there are almost no registered earthquakes due to the great distance from the boundaries of the plates and the lack of volcanoes.

Peniseismic zone is the zone contiguous to the plate boundaries where 15% of earthquakes occur per year and where the presence of volcanoes is scarce.

Seismic zone is the boundary zone of tectonic plates. It is a buffer zone between plates, and causes tectonic movements of great intensity, accounting for close to 80% of all earthquakes.

Due to their nature, the zones with the highest risk are those of high seismicity and volcanism, which are closely related.

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SKILLS DEVELOPMENT

Critical thinking skills: Formulating questions, summarizing.

Humanistic skills: Caring for others.

Intrapersonal skills: Developing civic awareness.

EVALUATION OF CONTENT

Students should get their questionnaire and poster checked by the teacher.

How much did I learn?

Read the following instructions and complete them.

- Pick a country that is located on a seismic or volcanic zone.
- Draw a map of the country you chose that includes the tectonic plates over which it is located.
- Glue your map on cardboard and draw a chronology of the seismic or volcanic events in the last 100 years.
- Share your work with your classmates and explain why the seismic and volcanic zones are related to tectonic plates.

The Structure of Earth's Continental and Oceanic Topography

How much do you know?

Write the answers to the following questions in your notebook.

- What is your city like: mountainous or flat? What kind of topography does your city have?

Earth's crust is made up of minerals and rocks, bodies that contain almost all the known chemicals, although some in higher quantities than others (Table 2.2). Its chemical composition gives Earth's crust a solid superficial layer, with a thickness that varies from 60 km in continents to 7 km on ocean floors. The earth's crust makes up the lithosphere in its entirety and is classified as follows according to its layout:

Continental crust is a layer with an average thickness of 35 km, although in mountainous areas it reaches 60 km. It is made up of granite rock and its surface is covered with sedimentary and metamorphic rocks.

Oceanic crust shapes the ocean floors and is much thinner than the continental crust; its maximum thickness goes from seven to 10 km and is basaltic in composition (Fig. 2.5).

The origin of continents and oceans dates back to Earth's formation, when the crust started cooling and rain started to fall. From then on, Earth underwent changes due to mutually related natural forces. One of the differences that can be found currently on the surface of Earth or lithosphere, is:

1. **Landmasses** that form continents and islands. Islands are smaller than continents in size, taking up 30% of Earth's surface and are mainly located in the northern hemisphere.
2. **Submerged landmasses** that make up the **oceanic basement**.

Chemical Elements	%	Chemical Elements	%
Oxygen	47%	Sodium	2.5%
Silicon	27.5%	Potassium	2.5%
Aluminum	8%	Magnesium	2.2%
Iron	4.5%	Others	1.5%
Calcium	3.5%		

TABLE 2.2 Elements of Earth's crust.

GLOSSARY

Landmass. Land that is not covered by water, and found above sea level.

Submerged landmasses. Land covered by oceans and seas. They are found below sea level.

Oceanic basement. Ocean floor.

→ Expected Learning

Identify the structure and distribution of continental and oceanic topography in the world and in Mexico based on Earth's internal and external dynamics.

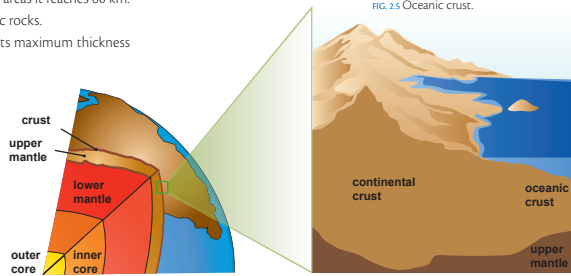


FIG. 2.5 Oceanic crust.

SESSION INFORMATION

Week: 10

Session: 37

Expected learning outcome: Identify the structure and distribution of continental and oceanic topography in the world and in Mexico based on Earth's internal and external dynamics.

CONTENT DELIVERY

Start: Check students' homework papers about another country in a seismic zone. Ask students what their city is like: mountainous or flat and what kind of topography it has (according to what they found). Elicit answers.

Development: Students should read on page 43 *The Structure of Earth's Continental and Oceanic Topography*. Help with vocabulary as necessary. Then, write the following questions on the board:

1. Mention the chemical elements in Earth's crust.
2. Which are the two types of crust on Earth?
3. What's the name of the surface of Earth?
4. What kinds of landmasses are there on the lithosphere?

Closing: Elicit answers in whole class explain every answer if necessary.

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

The answers to the questions can clearly demonstrate if students understood the text or not.

SESSION INFORMATION

Week: 10

Session: 37

Expected learning outcome: Identify the structure and distribution of continental and oceanic topography in the world and in Mexico based on Earth's internal and external dynamics.

CONTENT DELIVERY

Start: Students should read the top of the page and end of the topic *The Structure of Earth's Continental and Oceanic Topography*.

Development: In teams of three or four people, students should make a crossword puzzle of five to seven questions with information from the paragraph. For example:

Across

1. What was the name of the original continental block?

Answer: P a n g e a.

2. What was the name of one of the super continents?

Answer: G o n d w a n a.

Closing: Once they finish doing the crossword puzzle, they will exchange them with another team to answer each other's work.

Homework: Students should get a bar of plasticine (modeling clay) and piece of wood to make different models the following class.

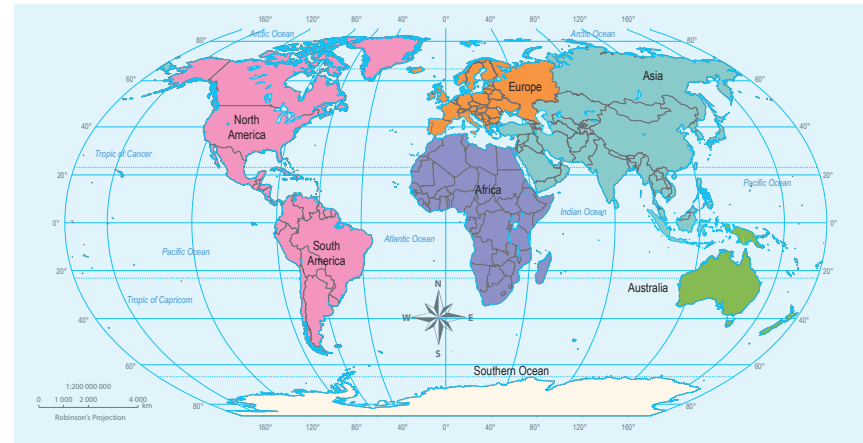
In order to understand the current location of continents we must go back to the fragmentation of the original continental block known as Pangea, which split into two supercontinents, Gondwana and Laurasia, 200 to 250 million years ago.

Through great natural evolution and development processes of continents, oceans and Earth's crust: in general, (as well as human intervention from a geopolitical standpoint), the current continents are: Asia, North and South America, Africa, Antarctica, Europe and Australia. On their surface, there are

masses of fresh water that form rivers, lakes and aquifers, whereas the large masses of salt water that form the oceans and the seas surround their coasts.

There are five oceans in total. The most important ones, according to their size and volume, ranked from biggest to smallest are: the Pacific, the Atlantic, the Indian, the Arctic and the Southern oceans. The difference between oceans and seas is that the latter are portions of the oceans, located close to the coast and have lower depths. All together, they make up 70% of Earth's surface (Map 2.4).

MAP 2.4 Continents and oceans of the world.
SOURCE: *Geografía de México y del Mundo*, Eduardo Pérez Torres, Esfinge.



Distribution of Continental and Oceanic Topography

The lithosphere is different from one place to another. It is impossible to find identical topographic forms in two different places. Internal forces and external ones are constantly interacting, shaping the topography of Earth's surface.

The classification of the topography is primarily based on the causes that originated these shapes and altitudes in relation to sea level. According to this criteria, the continental topography is classified as plains, plateaus, mountains, valleys and depressions.

Kells

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SKILLS DEVELOPMENT

Visual/Spatial skills: Doing crossword puzzles.

EVALUATION OF CONTENT

Students should get their crossword puzzle checked by the teacher.

Continental topography

Plains are they are vast flat or slightly undulating areas, located no more than 500 meters above sea level. They tend to be traversed by rivers and are formed by the accumulation of materials (**sediments**) originated by **erosion**. There is a wide variety of them: **coastal plains**, **lacustrine plains** and **karst plains** (Fig. 2.6).

Plateaus are elevated plains of more than 500 m above sea level and whose highest part is flat or slightly rippled. There are three types of plateaus: **high plateaus** located inside the continents and next to mountain ranges. The **piedmont plateaus** are located between mountain ranges and plains or between the sea and mountains. The **continental plateaus** are made up of small mountain systems and occupy continental extensions.

Mountains are surface elevations with a steep angle (slope) and with an altitude above 600 m. They are normally found in groups and known as ranges, systems or mountains. There are two types of mountains according to their shape, altitude and antiquity: the **ancient massifs** and the **young mountain ranges** that have a high altitude and steep shape (Fig. 2.7).

Ocean topography

Ocean topography has the exact same origin as the continental one: both are part of Earth's crust or lithosphere. There are very high mountain ranges that cross oceans, volcanoes and ditches as well as vast cliffs that could stretch all the way from Mexico to Brazil. The seafloor is divided into the continental platform, continental drop and the abyssal plain, where ocean ditches and ridges are located (Fig. 2.8).

Continental platform is the underwater extension of continents that stretches from the coast up to its endpoint, which can range from 1 to 500 km in width. It has a gradual slope and is up to 200 m in depth. It is known as the continental shelf.

Continental drop is a steep, sharp slope. It starts where the continental platform ends, it is approximately 200 m deep and ends in the abyssal plain, about 4,000 m in depth.

Abyssal plain is an immense plain, though not completely flat, located at an average depth of 3,800 m. It is where ocean ridges, countless underwater volcanoes and oceanic ditches and trenches are found.

Ocean ridges are underwater mountain ranges that originate from the accumulation of magmatic material that come from Earth's mantle. When they reach the surface they give rise to volcanoes.

Oceanic ditches are narrow and extended ditches of great depth. Some exceed 10,000 meters, like the Mariana Islands in the Pacific.

Coastal topography is the topography of coasts. Depending on their altitude, they can be either low and high, or cliff-like. Depending on their shape, they can be straight or have ins and outs.

As you can see, topography originates from geological history, which results in a slow and gradual change throughout millions of years. This means that the current mountain ranges we see today will most likely have a different shape and altitude thousands or millions of years from now.



FIG. 2.6 Plain.



FIG. 2.7 Mountain.

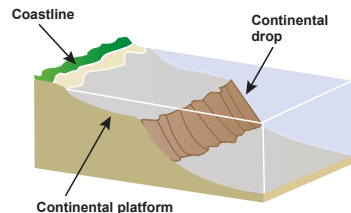


FIG. 2.8 Ocean Topography.

GLOSSARY

Sediments. Accumulated rock particles deposited in accordance to their means of transportation.

Erosion. Weathering of rocks, minerals and/or the soil's surface by different environmental agents.

SESSION INFORMATION

Week: 10

Session: 38

Expected learning outcome: Identify the structure and distribution of continental and oceanic topography in the world and in Mexico based on Earth's internal and external dynamics.

CONTENT DELIVERY

Start: Students should read page 45. Help with vocabulary.

Development: Assign one type of topography to different students (individually or pairs, according to the number of students you have). With the plasticine or modeling clay, have them model it and label it. They should make an exhibit so that everyone can explain and be explained about the specific topography feature in the lesson.

Closing: Students should clearly identify each kind of feature; ask for the topography names and characteristics.

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SKILLS DEVELOPMENT

Visual/Spatial skills: Modeling.

EVALUATION OF CONTENT

Students should actively participate in the models' production and explanation.

SESSION INFORMATION

Week: 10

Session: 39

Expected learning outcome: Identify the structure and distribution of continental and oceanic topography in the world and in Mexico based on Earth's internal and external dynamics.

CONTENT DELIVERY

Start: Students should look at the pictures and do the activities described in the section *Apply your Knowledge*. Check their answers.

Development: Ask students to look for the definition of erosion in the page. (A process that modifies topography). Elicit answers. Students should read the rest of the page. Help with vocabulary. Organize teams. Teams should make a synoptic table to summarize the information they read. Help them with the headings:

Types of external forces

Static (name them)

Dynamic (name them)

Dynamic agents (Three)

Water (describe it) (name its types)

Aeolian (describe it)

Closing: Ask for volunteers to make the synoptic table on the board. Help them build it up.

Homework: Students should get a map of Mexico, modeling clay (or plasticine) and a piece of wood.



FIG. 2.9 Erosion.



FIG. 2.10 Cave.

GLOSSARY

Karst. A formation created by the erosive action of water on rocks with a limestone composition.

Gelifraction. Rock fragmentation caused by the freezing or thawing of water that is contained in its pores or crevices.

TABLE 2.3 Erosion by water.

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Apply your knowledge

Do the following activity in your notebook:

- Look at the images below and describe their differences and write down the type of topography you see in each one.
- Point out which ones are similar, and if they are, write down what is similar and what is the same.
- Think of any factors that might modify the topography. What are they?



FIG. 2.11 Aeolian erosion.

Erosion as a Process that Modifies the Topography through Wind, Water and Ice

The external forces that modify topography are classified in two groups: static and dynamic. Among the static forces we find weathering, an action that destroys and pulverizes rocks chemically, biologically or physically without movement, and occurs in the same place where the rocks are located (Fig. 2.9).

On the other hand, we have dynamic agents whose implicit movement causes mechanical or physical weathering. We can identify at least three dynamic agents: erosion, transportation and sedimentation. The erosion cycle begins with weathering, followed by transportation by means of water, ice or air, and ends when all these materials are deposited in low areas of Earth's surface. Water, in its various states, is one of the main modifying agents of topography (Fig. 2.10) because it actively participates in the weathering, transportation and sedimentation of rocks and soil (Table 2.3).

Aeolian erosion is caused by the wind's force. It only acts on smaller particles like gravel, sand, clay and silt (Fig. 2.11). Aeolian erosion is more common in deserts, dry riverbeds and soils that have lost all vegetation. In its phase of sedimentation, the wind's action forms dunes that are mounds of sand. Depending on the direction of the wind, dunes can change in shape and size.

These agents are constantly modifying the topography and play an active role in the erosive process as constructive or destructive agents of the landscape. Man has a great influence on this erosive process. His actions play an important role in erosion because the multiple economic activities force him to be one of the transforming agents of the natural landscape and particularly of Earth's most intense topography. The direct or indirect action human beings have on rocks and soil is known as anthropic erosion.

Type	Characteristics
Pluvial	Weathering of rocks and soil due to the impact of raindrops.
Fluvial	Produce "V" shaped canyons and valleys (Fig. 2.13).
Marine	Material weathering and accumulation in coastal areas.
Glacier	Ice gathers materials formed by gelifraction .
Karstic	Underground runoffs.

SKILLS DEVELOPMENT

Critical thinking skills: Summarizing.

Visual/Spatial skills: Charting information.

EVALUATION OF CONTENT

Students should get their synoptic table checked by the teacher. They should actively participate in the section production.

Topographic Distribution in Mexico

The topography of Earth's crust in Mexico is one of the most complex in the world.

The complexity of its topography is so diverse that it includes high mountains, vast plains, large plateaus, valleys and depressions. In Mexico, regions with similar landscapes can be grouped in categories, the most important ones being the following:

Sierra Madre Oriental is the extension of the Rocky Mountains in Canada and the US. These provinces have been mapped in detail due to oil deposits and various **paleogeographical** elements that have been found (Fig. 2.12).

Sierra Madre Occidental is also an extension of the US mountains. It stretches from the northeast to the southeast of the nation and converges with the Transversal Volcanic System. This mountainous system is characterized by its high elevations of volcanic material. The particular geological and climatological conditions of this mountain range has fostered the formation of deep canyons that make spectacular landscapes like those of Cooper Canyon and Sumidero Canyon (Figs. 2.13 and 2.14).

Transvolcanic Belt is also known as the Neovolcanic Axis or the Trans-Mexican Volcanic Belt. It is a group of more than 2,000 structures that are the result of great volcanic activity. It is an active province, as the emission of igneous material shows (Fig. 2.15).

The Sierra Madre of the South is the extension of the Sierra Madre Occidental. It is one of the most complex mountain ranges as it is made up of different types of rock. It is an area of high seismic instability, located in the central valleys of the state of Oaxaca and the Mixtec region, where gold and silver deposits can be found.

The Sierra of Chiapas is located in the northern part of Chiapas and the south of Tabasco and is made up of limestone, similar to the Sierra Madre Oriental (Fig. 2.16).

The Sierra of Baja California is also an extension of the mountains in the US. It crosses the territory of Baja California and Baja California Sur and is made up of the mountain ranges of Juarez, San Pedro Martir and the Giganta.

GLOSSARY

Paleogeographical. Refers to the geologic past of Earth's surface in every moment of its evolution.



FIG. 2.12 Sierra Madre Oriental.

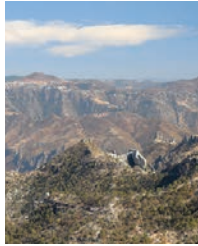


FIG. 2.13 Copper Canyon in Chihuahua.

Central Mexican Plateau is made up of 40% of the country's continental surface and is located between the Sierra Madre Oriental and the Sierra Madre Occidental and borders with the Trans-volcanic Belt in the south; certain transversal topographies divide it into two large groups: the so called Northern Plateau and the Central Plateau, or Anahuac Plateau. The latter has a number of valleys, most of them dried up ancient lakes filled with sediment.

Large extensions of plains are also found in Mexico, towards the Gulf coasts and the Pacific Ocean, where water and other resources such as oil and gas are exploited. The plain of the Gulf of Mexico extends from the south of the Rio Grande to the Yucatan Platform, and the plain of the coast of the Pacific is much narrower, with steps, cliffs and bays.

On the other hand, the most important depressions are those of the Balsas and that of Central Chiapas; there is a high population concentration in the first one, drawn by its highly fertile soils, and the latter is drained by the huge river system of the Rio Grande-Chiapas-Grijalva-Usumacinta, which makes it important to the construction of dams for hydroelectric plants to function.



FIG. 2.14 Sumidero Canyon.



FIG. 2.15 Popocatepetl and Iztaccihuatl volcanoes.



FIG. 2.16 Mountain system of the Sierra Madre Oriental.

SESSION INFORMATION

Week: 10

Session: 40

Expected learning outcome: Identify the structure and distribution of continental and oceanic topography in the world and in Mexico based on Earth's internal and external dynamics.

CONTENT DELIVERY

Start: Students should read the definitions on the page. Help with vocabulary as necessary.

Development: Students should model each feature described on the page over the map and plasticine they were told to bring to class and label them.

Closing: Students should be able to name Mexico's most remarkable topography.

Homework: Students should do the project described in the section *How much did I learn?* On page 48. It can be a weekend project since it is rather long.

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SKILLS DEVELOPMENT

Visual/Spatial: Modeling.

Critical thinking skills: Observing.

EVALUATION OF CONTENT

Students should get their models checked by the teacher.

SESSION INFORMATION

Week: 11

Session: 41

Expected learning outcome: Distinguish the importance of the distribution, composition and dynamics of ocean and continental waters around the world and in Mexico.

CONTENT DELIVERY

Start: Check students' projects (described on top of the page and assigned for homework the previous session). Students should discuss the introductory questions *How much do you know?* in teams. Elicit answers in whole class.

Development: Students should be divided in two teams. Students in team A will read the text on the page. Students in team B will listen and draw what they hear.

Closing: Ask students comprehension-check questions like these:

1. Is it true that all oceans are connected?
2. Which are the most important ecosystems?
3. What do oceans and seas mostly influence?
4. What is earth's temperature regulator?
5. Which current takes heat to Europe?
6. What do coastal waters hold?

Add comments to each answer to help comprehension.

Homework: Students should do the activity described in the *Apply your Knowledge* chart on page 49.

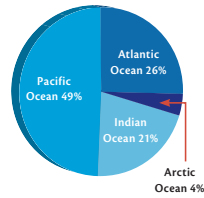


FIG. 2.17 Ocean distribution based on their extension.

How much did I learn?

With the following activity you will be able to identify the distribution of the continental oceanic topography around the world and in Mexico.

- Acquire the material ahead of time and do the following activity:
 - MATERIAL: a tectonic plates map, you can use the one in this book or a atlas from home or the library; a planisphere the size of a sheet of paper with its political division but without names; different colored pencils; 6 sheets of transparent or semi transparent paper (it can be vellum paper).
1. Locate the tectonic plates on the map and trace their boundaries with a red pencil on a sheet of vellum paper.
 2. Find a map of the topography of the world and trace all the mountain

ranges and terrestrial and marine volcanoes on a sheet of vellum paper.

3. Find a map of the earthquakes around the world and outline all the regions of major seismicity with an orange pencil.
4. Place the map of the planisphere with the political divisions at the bottom and the 3 other maps on top.
5. Identify the countries that are not close to oceanic topographic forms, volcanic and seismic regions and write a list of them in your notebook.

→ Expected Learning

Distinguish the importance of the distribution, composition and dynamics of ocean and continental waters around the world and in Mexico.



FIG. 2.18 Ocean waters offer fishing and other resources.



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The Importance of the Distribution and Composition of Ocean Waters

How much do you know?

Work in teams of four and discuss the advantages and disadvantages of living near oceans, rivers or lakes. Draw a two column table where you list them and write your conclusions in your notebook.

Although we speak of four oceans in the world, in reality they are all connected and make up a single body of water (Fig. 2.17).

Oceans and seas are the most important aquatic ecosystems in the planet, mainly because of their huge size and the influence they have on global climate patterns. Through their currents and winds they redistribute heat absorbed from the sun to such an extent that, if they did not exist, the temperature in the tropics and poles would be even more extreme. Therefore, the oceans are the world's temperature regulator. The great ocean and atmospheric circulation systems are driven by solar energy and transport heat from the tropical belt to higher altitudes. An example of this is the gulf current in the Atlantic Ocean that carries heat to Europe, thus regulating its temperature.

Oceans are very important for the planet because they are one of the main sources of life and biodiversity. The protection of ocean and coastal resources is important for all mankind and for Earth's sustainable development since it has some of the most complex and diverse ecosystems.

Coastal waters located less than 300 km from the mainland hold half of the total biological productivity of the oceans, providing almost half of the world's fisheries.

They are a vital part of the marine ecosystem's equilibrium that provides the world with food and energy, as well as climate and temperature regulation.

Besides fishing resources, the subsurface and seafloor (particularly Mexican ones), are an important source of hydrocarbons and minerals (Fig. 2.18).

SKILLS DEVELOPMENT

Interpersonal skills: Teaching others.

Listening skills: Getting a message.

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Check students' drawings and pay attention to student's answers to the comprehension-check questions.

Apply your knowledge

Acquire a planisphere and color it as follows: in red, the Pacific Ocean; in blue, the Atlantic Ocean; in green, the Indian Ocean and in purple, the Arctic Ocean.

- Do some research in books or on the Internet and complete the following table.

Data	Oceans			
	Pacific	Atlantic	Indian	Arctic
Extension (km ²)	165.200.000 km ²	106.400.000 km ²	73.556.000 km ²	14.056.000 km ²
Location (hemisphere)	Northern Hemisphere	Northern Hemisphere	Southern Hemisphere	No

- Make a list of all the benefits that the marine ecosystem provides to the world in your notebook; select those that may have a direct and indirect impact on the place where you live.

The Importance of the Dynamics of Ocean Waters: Ocean Currents, Tides and Waves

Two large spheres surround Earth: one is made of air, called the atmosphere, and the other is made of water, known as the hydrosphere. Their movements are connected. This dynamic causes oceans to vary in temperature, salinity and density levels; at the same time, the basic marine water movements occur in the form of waves, tides and surface and deep currents.

Ocean currents are great volumes of water that travel in an established direction; they are known for their regularity, uniform temperature and speed. They originate mainly through the action of regular winds that blow in the same direction all year round. The path they follow is determined by the configuration of the continents and their deviation as a result of Earth's rotation. In the northern hemisphere they move in a clockwise direction and in the southern hemisphere they move in the opposite direction.

They are of utmost importance in the maintenance of the thermodynamic balance of the planet, and of great importance in the coastal areas because they erode and transport materials until they settle and become sediments.

There are warm and cold ocean currents, depending on their temperature. Each one has a different influence on climates, coastal ecosystems, the resources they provide, tourism and fishing. Warm currents regulate the continent's climates, attract tourism, and benefit the coral ecosystem. Meanwhile, cold currents give rise to deserts because of their low humidity and an important production of **plankton** can be found in them, as well as very large schools of fish.

Waves are oscillatory movements in a body of water that manifest themselves when the surface ascends and descends. Mechanical forces, such as currents and winds, create this rolling movement of the marine surface. Waves resulting from an earthquake are called a tsunami. The energy given off by the continuous crash of the waves against the coast, the seas and currents, is significantly important because it erodes and transports coastal material until they settle as sediments in better-protected areas.

Tides are the ascending and descending periods of the sea level due to the gravitational impulse of the Sun and Moon that act on Earth's rotation. The movements of ocean waters, like swells, tides and ocean currents, influence

To Learn More

Seas do not have the same salinity; the ones with the highest levels of salt are: the Dead Sea with 200 g/l; the Caspian Sea with 150 g/l; or the Red Sea with 42 g/l. The ones with the lowest concentrations of salt are the Gulf of Bothnia with 3.5 g/l or the Baltic Sea with 0.2 g/l, among others.

GLOSSARY

Plankton. Group of floating aquatic organisms, made up of small larvae, protozoa and unicellular or small algae.

To Learn More

To find out more important facts on the oceans, go to: <http://bibliotecadigital.ilce.edu.mx/sites/ciencia/volumen2/ciencia3/067/htm/oceano8.html>

SESSION INFORMATION

Week: 11

Session: 42

Expected learning outcome: Distinguish the importance of the distribution, composition and dynamics of ocean and continental waters around the world and in Mexico.

CONTENT DELIVERY

Start: Check the answers to the table in whole class. Comment it as necessary.

Development: Ask students to look for the definition of ocean current, tide and wave in the paragraphs of the page. Elicit answers and write them on the board. Students should read the rest of the information on page 49 and the top of page 50. Help with vocabulary as necessary. In pairs students will create a 10-question quiz. They will exchange papers with another pair to answer each other's quiz papers.

Closing: Students should hand-in their fully answered quiz.

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

EVALUATION OF CONTENT

Ask students at random some comprehension-check questions. Check their quizzes.

highest altitudes, while others come from lakes; some others come from springs or thaw from high mountains. The flow is the amount of water a river carries. The rivers in Mexico come from rain, which means that they only carry water in the rainy season except for those in the southeast, where rain and humidity prevent them from drying up.

Lakes come from different sources: from Earth's movements, from volcanic formations, from the movement of glaciers, or when water is stuck in a depressed area and has no direct exit to the sea. Once a lake ages and disappears, a swamp appears and then finally turns into a wooded area.

The few lakes that are left in Mexico are used for fishing, irrigation and tourism. The most important one is Lake Chapala in the state of Jalisco. The most productive coastal lagoons in the country are those in the Gulf of Mexico, like the Alvarado and Tamiahua Lagoons and the Terminos Lagoon. On the Pacific side, the Mar Muerto and Joya-Buenavista Lagoons, as well as the Huizache-Caimanero and Yavaros Lagoons.

Wetlands are lands or areas where the saturation of freshwater or saltwater characterizes the nature of the soil and where the flora and fauna have adapted to such conditions. Wetlands stretch from the tundra to the tropics, in every continent except Antarctica. They commonly include swamps, mangroves, marshes, and peat bogs, among others, and have several functions:

Water Uptake in Watersheds

How much do you know?

- What rivers are located near your city? Are there lakes or dams?
- Where else does the water you use come from? How is it collected?

A watershed is an area drained by a river network that contains water runoffs and leads to a spot of terminal accumulation. All kinds of natural and renewable resources coexist in basins: water, soil, flora and fauna. The water uptake in a watershed maintains a close relationship and balance with

1. Supply water
2. Refill and drain aquifers
3. Purify water
4. Control the erosion of estuaries and rivers
5. Regulate microclimate (particularly rain and temperature)

The greatest quantity of water is found in oceans, but the supply of freshwater available to mankind is decreasing due to the increasing pollution of many of these water resources. In some countries, lakes and rivers have been transformed into repositories for a variety of deplorable waste, sewage, treated water, abundant toxic industrial residues, chemical substances resulting from agriculture, among others. (Fig. 2.19).

Water availability differs between countries as well. In Mexico, less than 10% of its total area provides more than half of the national water **runoff**.

How much did I learn?

Read and follow the next instructions to identify the importance of the distribution and structure of ocean and continental waters.

- Buy or draw a map of Mexico and color the oceans that surround our country. Find out where the most important rivers are located. Mark them on the map.
- Point out some of the regions that don't have bodies of water.
- Discuss with your classmates the importance of bodies of water and write your conclusions in your notebook.



FIG. 2.19 Earth's Oceans.

GLOSSARY

Runoff. A natural or artificial water current that fills a basin.

→ Expected Learning

Learn to differentiate between the importance of water uptake in watersheds as well as water availability around the world and in Mexico.

SESSION INFORMATION

Week: 11

Session: 44

Expected learning outcome: Distinguish the importance of the distribution, composition and dynamics of ocean and continental waters around the world and in Mexico.

CONTENT DELIVERY

Start: Ask students if they know how much drinking water there is in the world out of all water in the planet (only 3%).

Development: Students should read the entire paragraph *The Importance of the Distribution of Continental Waters in the World and in Mexico* (it starts on page 50 and ends on page 51). Help with vocabulary as necessary and then, they should mind map the information.

Closing: With the hydrographic map of Mexico, that they should have been asked to bring, students should do the activities described in the section *How much did I learn?*

Homework: Students should get a world map and a map of Mexico with names.

SKILLS DEVELOPMENT

Critical thinking skills: Mind mapping, predicting.

Visual/Spatial skills: Locating.

EVALUATION OF CONTENT

Check students' mind maps and maps of Mexico.

SESSION INFORMATION

Week: 12

Sessions: 45, 46

Expected learning outcome: Distinguish the importance of the distribution, composition and dynamics of ocean and continental waters around the world and in Mexico.

CONTENT DELIVERY

Start: Organize the group in teams. They should answer the questions in the introductory section *How much do you know?* On page 51. Elicit answers.

Development: Have students read the paragraph *Water Uptake in Watersheds*, which starts on page 51 and finishes in the middle of the page 52 as well as the paragraph *Locate the Main Watersheds in the World and in Mexico*. Help with vocabulary as necessary.

Closing: Students should make a comic stripe describing water uptake in watersheds. Then, on the maps they were told to bring, they will paint the basins described on page 52.

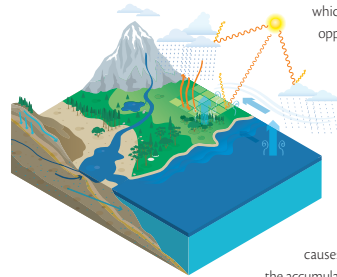


FIG. 2.20 Hydrologic cycle.

which forests play a determining role, as they offer more opportunities for water to infiltrate the subsoil. In addition, trees intercept water, which allow for condensation and precipitation into the ground. The pore spaces and consistency of the soil are modified by the growth of roots, facilitating infiltration. Under these conditions, the process takes place regardless of the steepness of topographic slopes (Fig. 2.20).

Water uptake in watersheds can also be conducted through the construction of reservoirs. Natural reservoirs are uncontrollable by nature and their causes can be as diverse as the collapse of mountainsides, the accumulation of ice or the building of dams by beavers. Artificial **reservoirs** are those made by humans.

Water balance results from the difference between the tributary and the losses of its system; water entry comes from and depends on several sources such as:

1. Direct precipitation on its surface.
2. Superficial waters coming from the watershed.
3. Groundwater finding its way to a lake through springs.

Reservoirs are an important resource in the development of fishing and aquaculture in Mexico.

These resources are part of the different terrestrial and marine areas in the country, their existence relies on topographic conditions and their geographical location. In other words, a basin that includes terrestrial ecosystems and marine ecosystems has limits that are established by the breaking point from which water pours into the demarcated area all the way to the exit point.

GLOSSARY

Reservoirs. Large volumes of water are held in topographic storage, natural or artificial, resulting from the construction of hydraulic works.

Water balance. The balance between all the water resources that enter and exit a system within a defined period of time.

Locate the Main Watersheds in the World and in Mexico

Rivers and their watersheds cover a wide range of natural environments in our planet and also host an essential part of the cultural diversity of the cities of the world. Certain important watersheds in the world can be identified according to their volume of water, precipitation, uptake, as well as the tributaries that pour their waters in them.

The Amazon Basin, as well as the other basins of high water volume in the world, are located in tropical areas and near the Equator.

In Mexico, there are watersheds of more than 100,000 km², like the Lerma-Chapala-Santiago; and of less than 100 km², like the Tizupan river base off the coast of Michoacan.

Basins are extremely important, not so much because of their size, but rather because of their origin, exploitation, use and maintenance. In Mexico, 37 hydrographic regions have been grouped according to the elements they have in common (Map 2.6).

The Importance of Water Uptake and Water Availability in the World and in Mexico

Freshwater has become a scarce, threatened and endangered resource around the world. Based on the global water balances and the current technological conditions, only 0.003% of the planet's freshwater is actually available for

human use. The destiny of humanity depends on this small portion. The least pessimistic forecasts suggest that by the year 2025, at least half of humanity will suffer some distress due to the lack of this vital liquid.

52

SKILLS DEVELOPMENT

Visual/Spatial skills: Graphic describing, locating.

EVALUATION OF CONTENT

Check students comic stripe and maps with the basins location indicated.



Water availability will always be essential for the production of food because it is a determining factor in the growth stages of plants, the absorption of nutrients, germination, number and strength of seeds, etc.

Other processes, like the water cycle, regulate vital environmental functions of ecosystems through their physical, chemical and biological functions. Water controls the processes and patterns of landscapes through evaporation, condensation and runoff, which is why the water cycle is the primary engine of life on Earth and its uptake in the various water basins plays an essential part in the existence of all living creatures. Water is not only an essential element for the functioning

of organisms that inhabit the earth, it is also the livelihood for most of them. Economic activities modify the composition of vegetation and soil, which in turn influence the distribution of precipitation on the amount of water flow and the season. Any change in use of soil implies changes in vegetation. When this occurs, there are alterations in water uptake, storage and distribution (Fig. 2.21).

Mexico gets approximately 1,489 billion cubic meters of water annually through rainfall. Precipitation in the basins of Mexico creates a **heterogeneous environment**, from those of the Baja California Peninsula to the **interior drainages** in the north of the country, which account for the territories with the least precipitation.

To Learn More

In the following webpage, you will find a complete table of water basins in the world, which also includes important data. http://earthrends.wri.org/pdf_library/data_tables/wat3_2005.pdf

GLOSSARY

Heterogeneous. Made up of parts of different nature.

Endorheic or interior drainage. Basin whose waters are held in a closed space.

MAP 2.6 Hydrologic regions in Mexico.

SOURCE: Compilation based on www.siga.cna.gob.mx/mapoteca.



FIG. 2.21 Economic activities alter the soil's composition.

SESSION INFORMATION

Week: 12

Sessions: 47, 48

Expected learning outcome: Distinguish the importance of the distribution, composition and dynamics of ocean and continental waters around the world and in Mexico.

CONTENT DELIVERY

Start: Students should read the paragraph *The Importance of Water Uptake and Water Availability in the World and in Mexico*, which starts at the bottom of page 52, continues on page 53 and ends on top of page 54. Help with vocabulary as necessary.

Development: Organize teams of four students. They will organize a TV show in which two of them will be two famous news broadcasters and the other two will be famous geographers. Students then, will role-play an interview in which they should ask and answer questions related to the information they read.

Closing: Have a team present in whole class.

Homework: Organize teams of three or four students. They should do the activities described in the section *How much did I learn?* On page 54.

Homework 2: Students should get a sky lantern.

53

SKILLS DEVELOPMENT

Bodily/Kinesthetic skills: Acting.

Critical thinking skills: Formulating questions.

EVALUATION OF CONTENT

Monitor teams' performances to check they are working on task and with the information from the book.

SESSION INFORMATION

Week: 13

Sessions: 49, 50

Expected learning outcome: Connect elements and factors of the different types of climates around the world and in Mexico.

CONTENT DELIVERY

Start: Check students' research homework in whole class. Then, ask them to prepare the sky lanterns outside, in the yard. When everyone is ready to launch the balloon, tell students: *Jules Verne wrote about a trip on a hot air balloon called "Around the World in 80 days". Imagine, you are about to take off for a similar trip. Tell goodbye to your beloved ones, and imagine you float away with your lantern. Now, release them.* Go back to the classroom.

Development: In pairs, students should complete the chart, which talks about a trip like "Around the World in 80 days" in the section *How much do you know?* The answers will depend on students' imagination. Therefore, there is no answer key to this chart.

Closing: Check students' charts.

Homework: Students will get a piece of cardboard and markers.

How much did I learn?

- Form teams of three or four and visit the next website www.conagua.gob.mx and refer to the *Atlas of Water in Mexico* (Atlas del Agua en México) found in the section on national waters.
- Do some research to find out where your city's water comes from.
- Identify and comment on the importance of basins that provide you with water. Write your conclusions in your notebook.

→ Expected Learning

Connect elements and factors of the different types of climates around the world and in Mexico.

Elements (Temperature and Precipitation) and Factors (Latitude and Altitude) of the Weather

How much do you know?

Imagine you have just won the Jules Verne contest "Around the world in 80 days", which consists of travelling for 80 days in a hot air balloon. You have to pack your suitcase with specific clothes for the trip according to the climate, temperature and humidity.

City and Country	Climate	Temperature	Humidity	Clothes
Ottawa, Canada				
Barrow, Alaska				
Managua, Nicaragua				
Lima, Peru				
Manaus, Brazil				
Moscow, Russia				
Tehran, Iran				
Osaka, Japan				
Nairobi, Kenya				

- Once you have completed the table, look up data in almanacs or on the Internet and check if you were right.
- Compare and write down what countries have the same climate.
- Indicate if the clothes you chose were appropriate and what would happen if they weren't.

The weather is the sum of multiple atmospheric elements and factors that prevail in a region, but what are these elements and factors?

Climate elements like temperature and humidity are among others, the main ones.

Kells

54

SKILLS DEVELOPMENT

Critical thinking skills: Imagining.

EVALUATION OF CONTENT

Check students' charts.

Temperature is the degree of heat in the atmosphere at a particular moment and place; the main source of heat energy comes from the Sun, thus temperature variation depends, to a great extent, on the planet's sphericity and its location on Earth's surface.

Precipitation is the volume of water found in one place and which is caused by humidity in the atmosphere and the presence of vapor masses (clouds).

Climate factors depending on their multiple interactions with the climate elements, define a specific region or geographical space. Some climate factors are latitude and longitude.

Latitude corresponds to the distance expressed in degrees, minutes

and seconds, between any point on Earth and the Equator. The great climate zones can be determined by latitude and by Earth's shape and how rays hit the surface. The equator and the tropics allow for a greater and more constant heating of the land and air masses; this heating progressively decreases toward the poles.

Altitude affects the heating of air and water masses at higher or lower levels. It is warmer at lower altitudes or when closer to sea level, progressively decreasing its temperature as we rise, about 6.4° every 1,000 meters of altitude.

These elements and factors interact and create the climates of different places on Earth, and gives them specific characteristics. Earth's climates are connected with the different types of vegetation, fauna, human settlements and economic activities of different areas.

Apply your knowledge

Work in teams of four. Read the next questions and write your answers in your notebook.

- What type of climate is there where you live? How does it affect your lifestyle and what benefit does it have?
- Why do you wear warm clothes in cold regions as well as at the poles?
- Why do you think it is warm in some places, while in others there is heavy rain or snow?

Earth's Climates According to the Köppen Climate Classification: Tropical, Dry, Moist, Cold and Polar

At the beginning of the twentieth century, the German climatologist and botanist Wladimir Köppen presented a classification of the different climate zones of the world, based on the various types of vegetation (Fig. 2.22).

The author conceived the idea that plants serve as climate indicators and their distribution defines the regions in relation to the climate, it is based on the use of average temperature (in degrees Celsius) and accumulated precipitation in millimeters; measuring a summer season and a winter one in the northern hemisphere.

Köppen defines five main climate categories that are distinguished through the use of capital letters (Table 2.4): each of the five groups is subdivided, which results in 14 fundamental types of climates.

Symbol	Climate	Zone description based on temperature
A	Tropical climates (rainy)	The coldest month has a temperature higher than 18°C
B	Dry climates	Evaporation exceeds precipitation. There is always water shortage
C	Temperate and humid climate	The average temperature of the coldest month is less than 18°C and above -3°C, and at least one month a year, the average temperature is over 10°C
D	Cold or boreal climates of snow and forest	The average temperature of the coldest month is lower than -3°C and above 10°C for the warmest month
E	Polar or snow climates	The average temperature of the warmest month is lower than 10°C and higher than 0°C
F	Perpetual ice climates	The average temperature of the warmest month is lower than 0°C



FIG. 2.22 Wladimir Köppen.

Curious Fact

The Greek word *klima* means *incline* or *tilt*, which implies that the distribution of tropical, temperate and polar temperatures takes into consideration the latitudinal differences of the Sun's radiation.

TABLE 2.4 Köppen classification.

55

SESSION INFORMATION

Week: 13

Sessions: 51, 52

Expected learning outcome: Connect elements and factors of the different types of climates around the world and in Mexico.

CONTENT DELIVERY

Session 51

Start: Students should read the weather components. Help with vocabulary as necessary.

Development: In teams, students will make a poster describing each of the weather components only with drawings. Have students place their posters around the classroom and explain the component they had to draw.

Closing: Students should get in teams again and do the activities in the section *Apply your knowledge*.

Session 52

Start: Students should read the information about the Köppen climate classification. They might look for definitions in an online dictionary.

Development: Students should illustrate each classification.

Closing: Check students' drawings.

Homework: Individually, students should do the activities described in the section *How much did I learn?* On page 56.

Homework 2: Individually, students should get at least four pictures of different places you assign, such as: Cancun, Lacandona rainforest, Pico de Orizaba, or any other place you like with different topography and weather.

SKILLS DEVELOPMENT

Visual/Spatial skills: Drawing.

Interpersonal skills: Working as a team member, teaching others, discussing.

EVALUATION OF CONTENT

Check students' posters and answers to the activities.

SESSION INFORMATION

Week: 14

Session: 53

Expected learning outcome: Learn to recognize the importance of the geographical conditions that favor biodiversity in the world and in Mexico.

CONTENT DELIVERY

Start: Check students' research homework papers described in the section *How much did I learn?* On top of this page.

Development: With the pictures they got for homework, they should do the activities described in the section *How much do you know?* Check answers in whole class; helping them through questions to see why according to the topography and weather, flora and fauna are different. Students have to read the two paragraphs in the rest of the page as well as the top of page 58.

Closing: Students should look at the map on page 57 and table below it. Then, they should predict what kind of biome there is in Mexico according to the climate.

How much did I learn?

- Look up your city and find data on temperature and precipitation throughout the year.
You can go to: <http://smn.cna.gob.mx/>; look for the Climatology tab and click on "Climate of Mexico."
- Look up the same information for another state in Mexico and compare the data. Identify the climates of the states you researched according to the Köppen classification.
- Present the results of your investigation and compare it with two of your classmates.

→ Expected Learning

Learn to recognize the importance of the geographical conditions that favor biodiversity in the world and in Mexico.

How much do you know?

Throughout your life, you've most likely visited a forest or beach outside your city or community. If you haven't, you can use any documentary that shows such places or photographs of a rainforest, forest or desert to describe one of these places considering the following elements:

1. Natural geographical space. Topography, climate (temperature, winds, rain) and hydrology (rivers, lakes, lagoons, seas, etc.).
2. Biological geographical space. Flora and fauna.
3. Social as well as economic geographical space.

Then comment on the importance of geographical conditions for the benefit of biodiversity.

GLOSSARY

Speciation. Process through which new species form due to geographical and genetic isolation.

Endemic. Species that comes from a specific geographical area of the world.

Geographical Conditions that Favor Earth's Biodiversity

The first studies on continent and organism distribution were performed by German geophysicist Alfred Wegener in 1915. He elaborated the hypothesis known as the Continental Drift, which stated that 270 million years ago there existed only one continental mass he called Pangea, which fragmented and formed the continents we know. These changes in the continental structure lead to changes in climate, ocean currents and a set of contrasting climates due to the irregularity in precipitation distribution, causing certain environmental pressure on species, forcing them to naturally select.

Climate Diversity in the World and in Mexico

Although Earth's climates vary greatly, they have been grouped according to the characteristics of the most important atmospheric conditions.

The original classification by Köppen can be insufficient at times and does not describe in detail the large number of transition climates that occur, which is why some investigators have chosen to modify and adapt Köppen's nomenclature to the specific conditions of each country. Despite these variations in the classification, Köppen's original system essentially maintains the main characteristics of its pluvial and temperature regimes. Mexico is known for a wide variety of climate variation that result from its geographical position and complex topography.

Distinctive Features of the Natural Regions of the World and Mexico

Natural regions are geographical areas that are distinct due to the association of flora and fauna, which maintain a close relationship with the climate, its distribution, abundance and human settlements. These natural regions are also known as biomes or ecosystems, and they are made up of rainforests, savannahs, coniferous forests, deciduous forests, steppe, desert and tundra (Table 2.5). Besides being very closely related to the climate, natural regions also relate to altitude and latitude. Therefore, ecosystem distribution coincides with that of world climates and topography and are named according to the predominant type of vegetation (Map 2.7).

The geographical isolation and genetic separation that these **organisms** went through in one same geographical area, resulted in the evolution towards new species over millions of years; this process is known as **speciation**.

According to certain scientists, the Continental Drift process generated a considerable increase in the number of species in the world and through this geographical isolation phenomenon we can identify that those present in Mexico are of recent origin and **endemic** nature.

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SKILLS DEVELOPMENT

Critical thinking skills: Predicting.

EVALUATION OF CONTENT

Check students' predictions.

SESSION INFORMATION

Week: 14

Session: 54

This page is complement of the previous one.

Expected learning outcome: Learn to recognize the importance of the geographical conditions that favor biodiversity in the world and in Mexico.

CONTENT DELIVERY

Start: Check students' research homework papers described in the section *How much did I learn?* On top of page 56.

Development: With the pictures they got for homework, they should do the activities described in the section *How much do you know?* Check answers in whole class; helping them through questions to see why according to the topography and weather, flora and fauna are different. Students have to read the two paragraphs in the rest of the page as well as the top of page 58.

Closing: Students should look at the map on page 57 and table below it. Then, they should predict what kind of biome there is in Mexico according to the climate.

Homework: Each student will get a world map, and in teams of three or four students, a piece of cardboard a device with Internet access, markers and pictures about a country they like from the following: Mexico, Brazil, Colombia, Ecuador, The U.S.A., Peru, Venezuela, China, Philippines, Indonesia, India, Malaysia, Madagascar, Congo, South Africa, Australia, Papua New Guinea.

MAP 2.7 Climate zones of Mexico
SOURCE: Compilation based on www.conabio.gob.mx

READING TIME
You can refer to your National Atlas of Mexico from primary school and look at the vegetation and climate map.

TABLE 2.5 Natural regions of Mexico.

Region	Köppen	Characteristics	Fauna	Flora	Area of
Rainforest	Af, Am, Aw	High temperatures, abundant rainfall	Jaguar, ocelot, spider monkey	Woods of high altitude, ferns	Veracruz, Tabasco, Campeche, Chiapas, Quintana Roo, Yucatán
Savannah		Meadows in warm humid climate Livestock	Similar to rainforest		
Coniferous forest	CF, Cw	Temperate climate and rains throughout summer	White tailed deer, coyote, badger, puma	60 m ² conifers	Sierra Madre Occidental and Oriental
Deciduous forest	Cw, Cx	Temperate climate Wood products		Red oak, walnut tree, willow, eucalyptus	

Region	Köppen	Characteristics	Fauna	Flora	Area of
Steppe		Transition between the savannah and the desert Livestock development	Pronghorn, hare, rabbit, snakes	Herbacea and small sized grass, nopales, mezquites and cacti (sahuaro)	Sonora, Chihuahua, Coahuila, Nuevo Leon
Tundra		Not found in the southern hemisphere, long winter, migration		Moss, lichens, shrubbery	Mountains and volcanoes
Deserts		Irregular rainfall, extreme temperatures			Chihuahua, Sonora

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SKILLS DEVELOPMENT

Critical thinking skills: Predicting.

EVALUATION OF CONTENT

Check students' predictions.

SESSION INFORMATION

Week: 14

Session: 55

Expected learning outcome: Learn to recognize the importance of the geographical conditions that favor biodiversity in the world and in Mexico.

CONTENT DELIVERY

Start: Students should read section *Location of the Megadiverse Countries on Maps* on page 58 and color the mega diverse countries in their world map.

Development: In teams, students will do the activities described in the section *Apply your knowledge*; they will need the pictures they got, cardboard, markers and a device to access the Internet.

Closing: Students will display their posters around the classroom.



FIG. 2.23 Desert.

Megadiverse countries	
America	Brazil, Colombia, Ecuador, USA, Mexico, Peru, Venezuela
Asia	China, Philippines, Indonesia, India, Malaysia
Africa	Madagascar, Congo, South Africa
Oceania	Australia, Papua New Guinea

TABLE 2.6

Additionally, topographic and climate factors are crucial in the wide variety of environments and in the richness of species that exist on our planet, which is why Mexico is one of the most complex countries regarding its geological history. Biogeographers consider the Mexican territory to be a transition area between two great regions where climate turns into a unifying element of landscapes. This gives way to several environmental pressures of exceptional nature that greatly enrich the biogeographical diversity by presenting irregular features and strong contrasts.

The complex topography, as well as the determining differences due to latitude, produce a climate mosaic with a great number of variations. The shape that the coasts give to a country, along with the alignment of its mountain ranges, have a strong influence on the distribution of humidity and oftentimes of temperature.

As a whole, this establishes the main elements of a complex process from which diverse bioclimatic conditions that cover extreme situations originate.

Location of the Megadiverse Countries on Maps

Megadiversity is a concept created by the environmental organization Conservation International (CI), to create awareness about areas of the planet that concentrate large biological richness and provide the means to protect it. It is estimated that 70% of the planet's biological diversity is concentrated in 17 countries, a surface that takes up 10% of the total of the earth. The Conservation Monitoring Center, an organization of the United Nations Environment Program (UNEP) has identified 17 megadiverse countries (Table 2.6).

Brazil has the largest number of species and is therefore, the most megadiverse country in the world. It is estimated that between 15 and 20% of the world's biodiversity is found in that South American country. Its rainforests take up 42% of the country and cover more than a third of the tropical rainforests of the world. The Amazon River Basin, where these forests are found, is the largest one on the planet. Following Brazil, a wide variety of countries host a large quantity of species of all kinds. In Colombian territory, which is seven times smaller than that of Brazil, a variety of ecosystems come together such as wastelands, the Andean slopes, tropical rainforests, wetlands, plains and deserts (Fig. 2.23).

Mexico has ecosystems that vary from perpetual ice at the peak of mountains, to tropical rainforests, coniferous forests, coastal lagoons and deserts, which host countless species. The majority can be found in Natural Protected Areas: places within our country that are excellently preserved and which house these biologically diverse ecosystems. These factors have contributed to forming a mosaic of environmental and micro environmental conditions

that promote a wide variety of habitats and life forms (Fig. 2.24). On the Asian continent, Indonesia is one of the key examples of megadiverse countries.

Usually, the richness of species is measured as a simple count of the number of species within a predetermined area. The alpha, beta, gamma diversity classification includes this consideration on different scales.

The gamma diversity (or regional) is the one that allows Mexico to be considered a megadiverse country and is determined primarily by historic factors; **the alpha diversity** (local or within the habitat) refers to the number of species within predetermined habitats, in this case, those of Mexico are not particularly rich compared to other similar ones worldwide; **the beta diversity** (between habitats) takes into account the species turnover rate along a gradient of habitats with which a measure of heterogeneity of a country's habitats is obtained.

Apply your knowledge

Work in groups of four to do the following activity:

- Select two natural regions of other countries you wish to learn more about. Research the region's distinctive information that will allow you to describe it in detail. Make a list of the fauna and vegetation of the region you selected. Classify the plants and animals you researched, considering those that are endemic or non-endemic.
- Once your information is complete, prepare a presentation of the characteristics of the region as well as its fauna and vegetation.

Kells

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SKILLS DEVELOPMENT

Visual/Spatial skills: Locating.

Interpersonal skills: Working as a team member.

Critical thinking skills: Doing research, discriminating information.

EVALUATION OF CONTENT

Check students' world maps and posters.

The Importance of Biodiversity in the World and in Mexico

The concept of biodiversity generally refers to life's variability, including terrestrial and aquatic ecosystems and the ecological complex they belong to, as well as the diversity between and among species. Therefore, biodiversity covers three levels of biological expression of variability: ecosystems, species and genes.

A vast range of phenomena integrates these levels so that the biodiversity of a country is reflected in the different types of ecosystems it has, the number of endemism, the subspecies and varieties of the same species, among others.

Global biodiversity today is greatly affected by man's irrational activity. Therefore, the certainty that life and the balance of the planet are threatened by human development is a reality. The total number of known species in Mexico is 64,878. The increasing tendency in factors that threaten biodiversity leads to the irreversible loss of populations, species and ecosystems, and the degradation of environmental services. Mexico is known for hosting some of the largest biodiversity in the world. (Fig. 2.24). This biodiversity offers numerous environmental services that are essential to humanity's existence and its social wellbeing.

Ecosystems are of the utmost importance to our subsistence because they shape the environment humans use for their benefit. To continue benefitting, we must maintain stability by balancing the needs of the environment, the economy and society. There is currently a better understanding of what biodiversity is and the drastic changes caused by human activity. However, it is hard to place a value on it, but we can say that its loss would show disdain for millions of years of evolution and natural selection. To better understand this predicament, the value of biodiversity has three main components, which are:

- The direct economic value of the consumed resources.
- The indirect economic value resources without being consumed.
- The ethical value.

Biodiversity possesses an economic value simply because it affects the functioning of the ecosystems, and therefore the services we obtain from these, which are the raw material for the global economic engine.



FIG. 2.24 Example of biodiversity: Reptile of the Mexican desert.

How much did I learn?

Fill the empty spaces on the table as indicated:

1. Fill in the information needed in the the **climate name** column.
2. Indicate the key climate according to the Köppen classification in the column corresponding to climate **symbol**.
3. In the column referring to the type of ecosystem, fill in the different types of ecosystems found in the climates.
4. Briefly describe three activities that can be exploited depending on the natural resources of each climate in the **activities** column.

CLIMATE SYMBOL		Type of Ecosystem	Economic activities
Climate Name	Symbol according to Köppen		
TROPICAL	Af	Rainforest: and tropical rainforest, depending on the rainy season	Agriculture and forestry.
Arid	B	Steppe and desert.	Plant extraction for medical use, irrigated agriculture and mineral exploitation
POLAR	F	Tundra, there are almost no vegetation.	Potential use of water and mineral exploitation. Animal fur extraction
TEMPERATE	C	Temperate forests, the temperature is moderate	Furniture manufacturing, fruit extraction.
Continental	D	Coniferous forest, evergreens, rains and snowfalls	Exploitation of natural resources, farming.

SESSION INFORMATION

Week: 14

Session: 56

Expected learning outcome: Learn to recognize the importance of the geographical conditions that favor biodiversity in the world and in Mexico.

CONTENT DELIVERY

Start: Ask students to look for the definition of biodiversity in the text. Elicit answer and get it written on the board by a student.

Development: Students should read the page. Students should look up any word they do not get.

Closing: Students should complete the table in the section *How much did I learn?* Elicit answers and help them correct or complete information.

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SKILLS DEVELOPMENT

Critical thinking skills: Summarizing.

EVALUATION OF CONTENT

Check students' answers in the table.

SESSION INFORMATION

Week: 15

Sessions: 57 - 60

Expected learning outcome: Apply information of the unit to develop and present a project.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, the comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask their 5 comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

Project

GLOSSARY

Epicenter. Point on Earth's surface where an earthquake is felt with highest intensity.

The Natural Components of the Geographical Space

The project in this unit aims at helping you work, research, develop and present a situation that deals with the natural components of the geographical space around you; its characteristics, behavior and influence on your community. Read the following text which gives you a situation that you can use as an example to develop your project. Remember to follow the steps included in the project in unit 1 (pages 32 and 33); start with a question to foster curiosity, research the topic to answer and increase knowledge, develop all possible scenarios resulting from your research, present your work and always look for your project to provide benefits to your community.

→ Reading

September 1985 earthquakes in Mexico

The natural dynamics of our country, the presence of active geological defects and tectonic plate activity, added to adverse soil characteristics and large population density, contribute to Mexico being one of the most seismic countries in the world. The zones affected by earthquakes are made up of 11 federative entities in its entirety and 14 entities partially, covering more than 50% of the national territory.

On September 19, 1985, at 7:19 am, an earthquake of 8.1 on the Richter scale, 16 km deep, with its **epicenter** in the city of Lazaro Cardenas, Michoacan, shook most of the Mexican territory, causing the greatest damage in the country's capital. The next day, a second earthquake of 7.5 on the Richter scale shook the capital once more. That second one caused another 20 collapses.



The most affected area from the first earthquake covered from the Raza monument in the north of Mexico City, to the Alamos neighborhood in the south, a total of 40 km². 9,000 deaths were officially reported, about 50,000 wounded, at least 3,000 missing and 100,000 victims. More than 500 buildings collapsed, 3,000 suffered damages and 600 were demolished.

Mexico and its capital are not exempt from suffering another catastrophe of such magnitude, which is why people must be informed to know how to face an event of this nature.

Source: CENAPRED. Centro Nacional de Prevención de Desastres, Secretaría de Gobernación, Sismos, First Edition, December 2003.

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SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Evaluation

What I have learned

Read the following questions carefully and answer them.

1. What tectonic plates is Mexico located on? Underline the correct option.

North American Plate

Caribbean Plate

2. Mention two agents of erosion that modify the topography.

The agents of erosion are: water, ice and wind.

3. Explain the importance of ocean and marine currents.

They help to control temperature and salinity of water. They are of utmost importance in the maintenance of the thermodynamic balance of the earth.

4. What is the relevance of basins in the uptake of water?

They help in the balance of the hydrologic cycle and in the existence of all living creatures.

5. Mention two types of climates from the Köppen classification.

According to Köppen, there are these types of climate: Tropical, dry, temperate and humid, cold or boreal, polar or snow and perpetual ice.

6. Mexico is a megadiverse country. Mention some of the geographical conditions that benefit it.

The shape of its coasts, its mountain ranges, and a great variety in climates, that allow diverse ecosystems.

Kells

Self-Evaluation

Read each key aspect to evaluate and tick (✓) the ones you have achieved.

Key aspect to evaluate	I do it very well	I have a hard time doing it	I need help doing it.
I can relate the distribution of seismic and volcanic regions with tectonic plates.			
I can identify the formation and distribution of continental and oceanic topography based on Earth's dynamics.			
I can distinguish the difference between the distribution and dynamics of ocean and continental waters.			
I can distinguish the importance of water uptake in water basins, as well as water availability.			

Peer-Evaluation

Team up with a classmate and evaluate what you have learned regarding the following. Discuss among yourselves the relationship between the different climates and the importance of geographical conditions for diversity.

Key aspect to evaluate	I do it well	I have a hard time doing it	I need help doing it.
I can relate the elements and factors of the different types of climates of the world and Mexico.			
I can value the importance of the al conditions that favor the biodiversity of the world and Mexico.			

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SESSION INFORMATION

Week: 16

Sessions: 61 - 64

EVALUATION AND SELF EVALUATION

CONTENT DELIVERY

Start: Students should answer page 35 (Evaluation) prior to taking the unit assessment. Go through the answers; help them with techniques to study content they do not clearly remember.

Development: Students are to take the unit assessment. You can find it in the Teacher's Guide pages 149 to 151 along with the answer key.

Closing: Check their assessments, record the score and provide with feedback. You might want to use the Attendance and Evaluation formats that you can find the Teacher's Guide pages 166 and 167.

SKILLS DEVELOPMENT

Metacognitive skills: Self-monitoring, self-evaluating learning outcome.

EVALUATION OF CONTENT

Check students' self-evaluation. Use the unit assessment along with the answer key pages 149 to 151.

Student book U3

SESSION INFORMATION

Week: 17

Session: 65

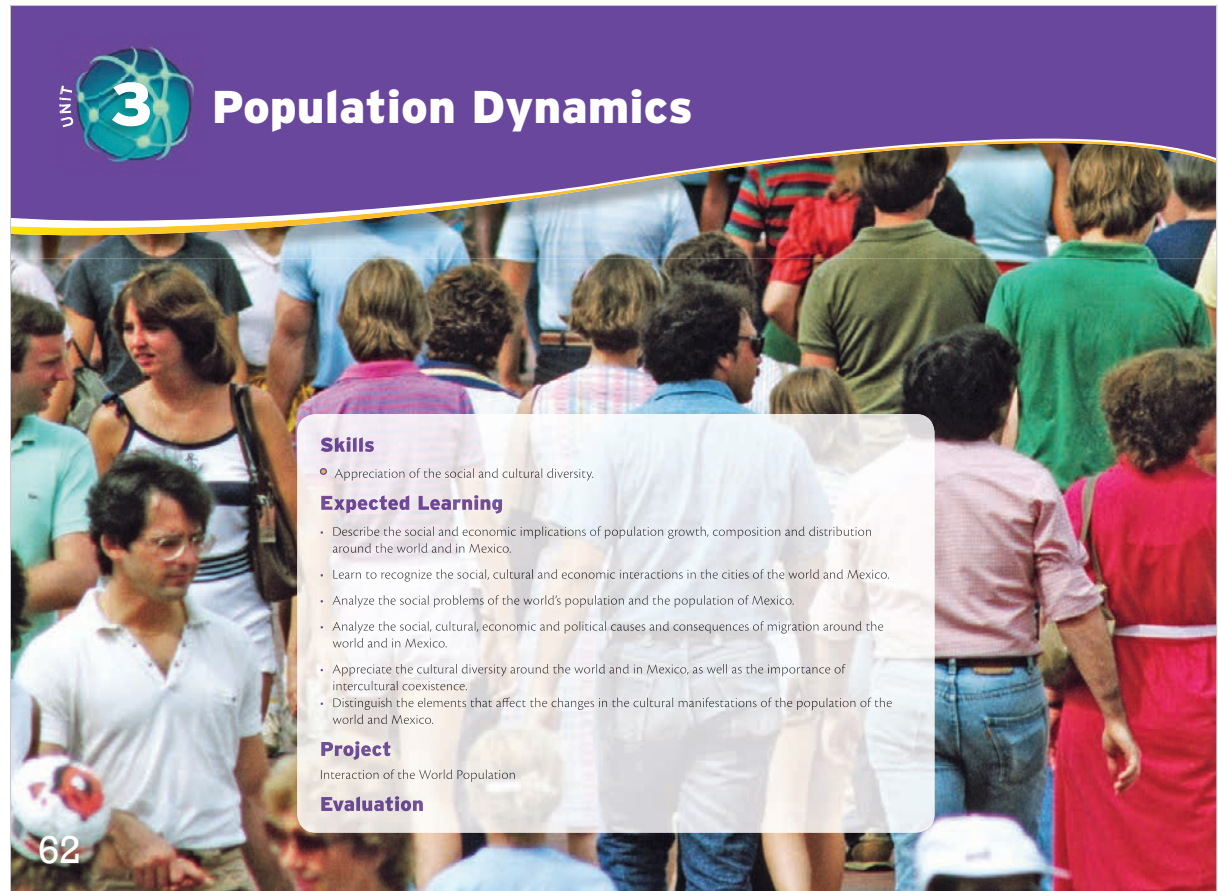
Expected learning outcome: Identify topics in the unit students consider will be hard to understand in order to make a studies plan.

CONTENT DELIVERY

Start: Have students identify and analyze what they could do well in units 1 and 2; as well as what they should improve in unit 3. Ask them, for instance: What topics were easy? Did your previous study plan work? Didn't it work? Why? Did you really follow your study plan? Students should write down their reflections

Development: Have students check the skills, learning outcomes and key concepts in unit 3. Ask them to identify the topics they consider the hardest ones. Then, they should plan how to study them and do better than the previous unit. If a strategy didn't work, then they should find another one. Help them with ideas. (Drawing mind maps, discussing with partners, making their own exams, making timelines, making associations, etc.)

Closing: Students should write down their study plan and have it checked.



UNIT 3 Population Dynamics

Skills

- Appreciation of the social and cultural diversity.

Expected Learning

- Describe the social and economic implications of population growth, composition and distribution around the world and in Mexico.
- Learn to recognize the social, cultural and economic interactions in the cities of the world and Mexico.
- Analyze the social problems of the world's population and the population of Mexico.
- Analyze the social, cultural, economic and political causes and consequences of migration around the world and in Mexico.
- Appreciate the cultural diversity around the world and in Mexico, as well as the importance of intercultural coexistence.
- Distinguish the elements that affect the changes in the cultural manifestations of the population of the world and Mexico.

Project
Interaction of the World Population

Evaluation

62

SKILLS DEVELOPMENT

Metacognitive skills: Planning, organizing studies content.

EVALUATION OF CONTENT

Students should get their study plan checked by the teacher.

The World's Population Growth and Composition

How much do you know?

Answer the following questions in your notebook and then share with your classmates:

- How many people live in your house? How many people live on your street or in your building? How many people are there in your country? How many people are there in the world? Do you think it is useful to know this information? Why?
- Do you know what a census is and what it is for?
- Why do you think there are cities with more population concentration?

Population is the term used to indicate the number of inhabitants in a town, province or nation. It is very important to know the numerical value of the population to determine the growth rhythm and its structure. To that end, basic demographic indicators, such as birth rates, infant mortality, migration and life expectancy, are used. This information obtained through counting instruments known as census, which is a process of collection, compilation, analysis, evaluation and publication of **demographic** and services information. Censuses are carried out in every nation on a periodical basis and later they are added to the world census. In our country's particular case, it is carried out once every 10 years (Fig. 3.1).

Throughout history the world's population has changed its constitution, structure and size. In the beginning, man relied heavily on hunting and fruit gathering, and it was not until the discovery of agriculture and the domestication of animals that the first sedentary groups were established. In the First Neolithic Agricultural Revolution, which happened around 10,000 years ago, life conditions were harsh, and this fact created an increase in the production of food and, as a consequence, an important growth in the population.

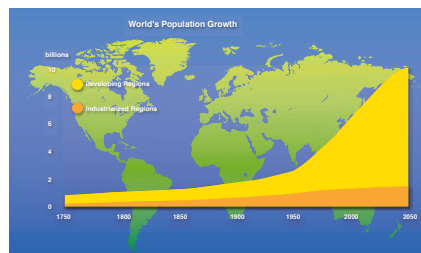
It was around 5,000 years later that the Urban Revolution happened. Different communities were built and established themselves permanently in places with favorable characteristics for the production of food but the growth rhythm continued being moderate.

During the fourteenth century, the rise of the population was slow-paced and the growth periods were interrupted by catastrophes such as wars, the plague and famines. It was during the Industrial Revolution in the

mid-eighteenth century, when growth was definitive and promoting an accelerated increase in the world's population.

The twentieth century had a similar profile to the Industrial Revolution. There was a constant growth rhythm due to the decrease in mortality rates, and to medical and technological advances. Advances in these fields allowed the improvement of hygienic habits, **prophylaxis** and the treatment of diseases previously considered as deadly. Scientific advances have led to an extended life expectancy and have improved the prevention and medical treatment for the cure of diseases, among others.

The UN considers that the world population is a little over 6,750 million people, irregularly distributed in 136'858,000 km² of Earth's surface.



→ Expected Learning

Describe the social and economic implications of population growth, composition and distribution in the world and in Mexico.

GLOSSARY

Demography. Study of the human population, especially the measuring of quantity, composition, distribution and change.

Prophylaxis. Prevention or group of medicines that avoid a disease.



FIG. 3.1 The economic census allows us to know ourselves as population and culture.

SOURCE: United Nations' Population Division and Population Reference Bureau, 1993.

CHART 3.1 World's population historic growth trends and their projections for 2050.

SESSION INFORMATION

Week: 17

Session: 66

Expected learning outcome: Describe the social and economic implications of population growth composition and distribution in the world and in Mexico.

CONTENT DELIVERY

Start: In pairs, students should ask and answer the questions in the introductory section *How much do you know?* They might need a device with access to the Internet to fully answer the questions.

Development: Have students read the entire page. Have students look up for terms they do not know. Before, prepare nine cards with the following terminology that is introduced in the text: Population, demographic indicators, census, Urban Revolution, demography, prophylaxis, First Neolithic Agricultural Revolution, sedentary groups, famine. Students are to play tic-tac-toe; so, place the cards in three columns and three rows. Divide the group in two large teams. One student from each team will pass to the board and take a card. He or she will read in silence the term, he can tell synonyms, antonyms or explanations but never the term. The team should guess the term he or she has in the card. The team that can first make a vertical, horizontal or diagonal line is the winner.

Closing: Students should be able to identify the meanings of key terminology.

Homework: Divide the group in trios. Each trio should get a piece of cardboard, markers.

SKILLS DEVELOPMENT

Verbal/Linguistic skills: Playing word games.

Critical thinking skills: Remembering, defining concepts.

EVALUATION OF CONTENT

Students should either clearly define terms or identify them.

SESSION INFORMATION

Week: 17

Session: 67

Expected learning outcome: Describe the social and economic implications of population growth composition and distribution in the world and in Mexico.

CONTENT DELIVERY

Start: Students should read the rest of the section *The World's Population Growth and Composition*. They should look up the meaning of any new term they find.

Development: In trios, students should make a five-picture storyboard on the piece of cardboard with the information they read. (A storyboard is like a cartoon in which a story or information is visually described).

Closing: Students should display their storyboards on the walls.

Homework: Students should get some post-it notes.

To Learn More

90% of the world population lives in the Northern hemisphere and only 10% lives in the Southern hemisphere.

GLOSSARY

Histogram. Chart representing the frequency distribution; they are divided into classes.

Several factors influence the distribution of the population among which are the **social kind** factor and the **economic** factor. Accelerated growth, the international migration movements, the great number of young people and at the same time, an increase in the aging population around the world, represent a great challenge for sustainable development (Chart 3.1).

Throughout history a region can mark differences in growth, composition and distribution of its population. In a demographic study it is important to analyze how the composition varies by ages in a country, since it depends on the planning of many services focused on certain sectors of the population.

The distinctive features of the population are different from place to place, however, within the same country there could be similar profiles between the inhabitants of a city and the people who live in a rural community. The number of children, teenagers, adults and seniors varies a lot from one nation to the other because of the customs, religion, way of life, social profile, activities, ideologies among other factors.

The larger a population is, the more the demand for services, food, natural resources, water, job opportunities, etc.; this means that governments will have to create policies to fulfill them.

The composition according to age and gender comes from census data and is presented in charts through what demographers call a population pyramid. They are two bar charts or **histogram** where the variables of age, gender and thousands

or millions of inhabitants are combined (by age group).

It is interesting to analyze the different pyramids of the world, since every one of them shows different ways and structures; their numbers vary, but the information given is the same: number of women and men per group of age, population dynamics, proportion of the segments of the population and its evolution through time. Japan was the first country to adopt demographic policies that slowed down its growth. From then on, some countries started implementing their own policies based on their characteristics. The Mexican demographic policy dates from 1973. From those policy changes, the population structures of many countries were modified due to the change in the inhabitants' behavior. (Chart 3.2).

In the twentieth century developed countries drastically changed their population structure. They started the century with a broad-based pyramid, which means they had a predominant population of children and youth. By the mid-century, these countries had a certain balance in the number of young people, adults and elderly, and finished this same century with a higher adult and elderly population, greatly reducing the children and youth proportion. Nowadays there is a small number of children in some developed countries.

According to the National Population Council (CONAPO), Mexico's demographic situation is as follows: its growth rhythm has decreased, the number of women and men is very similar (51% women and 49% men), the youth population prevails, but the population of children from 0 to 4 has decreased. Mexico's population grew by 100 million from 1895 to 2010. (Chart 3.3).

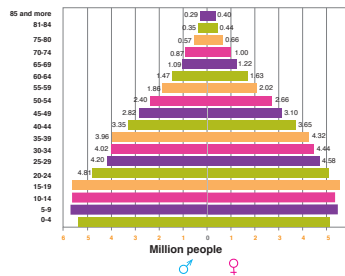


CHART 3.2 Developed countries and underdeveloped countries in the world.

Global Population Distribution Absolute Population and Population Density

The world's population is not evenly distributed on the Earth's surface. Only 5% of the surface has the right conditions for the settlement of populations. Social groups will always seek the most favorable places to live. Temperate climates, areas with fertile soil and places with job opportunities are ideal for their settlement (Fig. 3.2).

In order to understand better such a heterogeneous distribution, we must consider factors such as the total amount of surface land, the number of inhabitants in a certain place and how they are distributed in the territory. To learn and analyze this demographic and spatial configuration in detail, geographers use two basic terms: **absolute population** and **relative population**.

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SKILLS DEVELOPMENT

Visual/Spatial skills: Graphing information, outlining.

EVALUATION OF CONTENT

Check students' storyboards.

Absolute population refers to the total number of people who live in a certain place, state, country, region, continent or in the world. It is estimated that the absolute population of the world in 2008 was 6,750 million persons.

Relative population is the number of inhabitants in a determined surface, and results from dividing the absolute population by the stretch of land in square kilometers. This allows us to know the number of inhabitants per square kilometer in a territory. This information is known as population density. In order to calculate the relative population or the population density of the world in 2008 we have to carry out the following operation:

$$\text{Population density} = \frac{\text{Population (millions)}}{\text{Millions of square kilometers.}}$$

We substitute the estimated numbers: (absolute population of the world by the millions of kilometers of the surface land).

$$\text{Population density} = \frac{6\,750 \text{ million inhabitants in the world}}{136\,858\,000 \text{ Km}^2}$$

And we get as a result a population density of 49 people per square kilometer.

$$\text{Population density} = 49 \text{ inhabitants/Km}^2$$

The absolute and the relative population of each region can have different values, depending of the natural growth and the migration movements.

Statistics are extraordinary tools because they provide us with a great amount of information. If the information about the absolute population (total) and the surface it uses are related, we get the relative population

Region	Surface (Km2)*	Absolute population in 2008	Population density in 2008
World	136,858	6750	49
Africa	30,365	987	33
North America	24,346	345	14
Latin America and the Caribbean	18,628	576	31
Asia	44,614	4075	91
Europe	10,400	732	70
Oceania	8,505	34,9	4

SOURCE: United Nations, Department of Economic and Social Affairs, Population Division (2011). World Population Prospects: The 2010 Revision. New York, Almanaque Mundial 2006, Ed. Televisa.

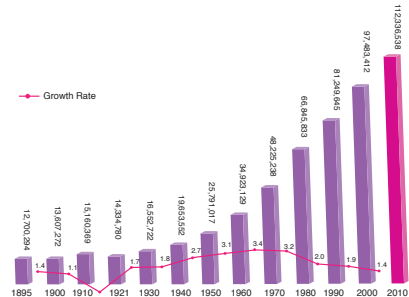


CHART 3.3 Mexico's population growth from 1895 to 2010.

SOURCE: INEGI, Mexico population census from 1895 and 2010.



FIG. 3.2 The population distribution in the world is not equal.

TABLE 3.1 Population density.

SESSION INFORMATION

Week: 17

Session: 68

Expected learning outcome: Describe the social and economic implications of population growth composition and distribution in the world and in Mexico..

CONTENT DELIVERY

Start: Students should scan the section *Global Population Distribution Absolute Population and Population Density* that starts on page 64 and continues on page 65 to find the definitions of: *absolute population* and *relative population*. Have students underline it and then ask some students to paraphrase the definitions.

Development: Students should look up any term they do not understand. Then, in pairs they should ask and answer questions about the graphs, for instance: *How many people were there in Mexico in the 1970 census?* (Answer: 48, 225,238 people). *How large is Africa's surface?* (Answer: 30, 365, 000 km²). *What was the population density in Latin America in 2008?* (Answer: 31 people per square kilometer). Monitor students by walking along the classroom to check students are on task and offer support.

Closing: Ask students some similar questions about the graphs.

Homework: Students should get a world map and vellum paper.

65

SKILLS DEVELOPMENT

Logical/Mathematical skills: Interpreting graphs.

Reading skills: Scanning.

EVALUATION OF CONTENT

Students should understand how to read the information in the graph.

SESSION INFORMATION

Week: 18

Session: 69

Expected learning outcome: Describe the social and economic implications of population growth composition and distribution in the world and in Mexico.

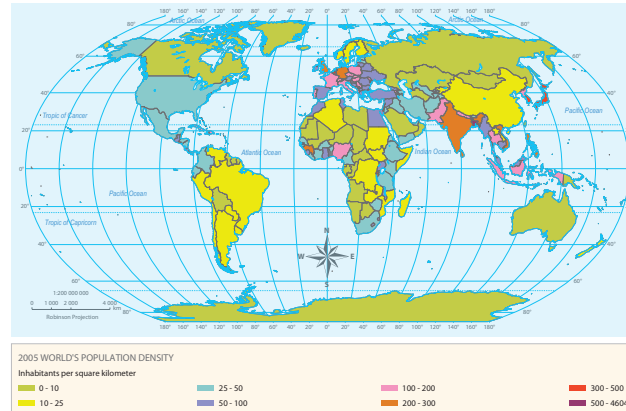
CONTENT DELIVERY

Start: Students should read the rest of the section *Global Population Distribution: Absolute Population and Population Density* on page 66 and identify the regions the section refers to in the map 3.1.

Development: Students should do the activities described in the section *Apply your knowledge* (they will need the map they were told to take to class).

Closing: Go through students' answers to the activities.

Homework: Students should get a world map and color pencils.



MAP 3.1 Population distribution.



FIG. 3.3 Australian Desert.

While observing the map with the population distribution (Map 3.1), we can see that the four most populated regions in the world are on the Northern hemisphere: the Eastern and Southern part of Asia, the European

Apply your knowledge

1. In the previous unit you drew several maps on semi-transparent paper, that you overlapped. In one of them you were asked to draw a map of the world's population distribution. Check the map again and answer the following questions in your notebook:
 - a) Draw another map in which you point out the contrast between the most populated area (mark them in yellow), and the unpopulated ones (mark them in gray).
 - b) Explain why the population settles in certain regions and avoids others. Explain the elements that determine the different populations in the world and their social and economic implications.
 - c) Explain which elements combine for the different population distribution in the world and, if it has social and economic implications.
2. What is the relationship between the natural regions and the global population distribution?
3. In pairs, present at least three natural factors that allow the settlement of human populations on the planet.

region from the Ural Mountains to Spain, the North American Atlantic coast and South America's South East. These four regions cover only 10% of Earth's surface and are inhabited by more than 300 million people. In these regions there are attractive elements such as rivers, lakes, seas, plains, fertile soil, trees, mountains, etc., which provide different natural resources. Some of these regions have made great technological and scientific advances and have successfully taken advantage of the natural resources.

Regarding the less populated areas of the world, three of them stand out, where weather conditions are extreme, and even technology has not been able to create the appropriate and favorable conditions for their population. The first place is located in the polar zone of the Northern hemisphere, which is inhabited by a group of Eskimos in North America and the people of the Lapland region in the North of Europe. The second place is located in the Amazon rainforest and in the Congo rainforest. None of these regions are suitable for settlement, with the exception of a few local ethnic groups who are at risk of extinction.

In the third place are the great deserts such as the Australian Desert, the Sahara and the Gobi Desert in Mongolia. They are big regions where the population is almost non-existent; it is only possible to find human settlements in oases and nomadic groups that move between them (Fig. 3.3).

The population distribution is affected by different physical, historical and economic factors. Economic development and technological advancement counterbalance the physical and environmental factors that prevent the population of empty spaces.

66

SKILLS DEVELOPMENT

Visual/Spatial skills: Locating places.

Critical thinking skills: Remembering, contrasting.

EVALUATION OF CONTENT

Students should complete the activities in the section *Apply your knowledge*.

Population Density and Dispersion in the World and in Mexico

The population distribution in the world according to the United Nations Population Fund (UNPFA), points out that China and India are the most populated countries, having 37% of the world population. Japan has the highest population density, while the less populated regions are Northern Russia, the Arabian Peninsula, Southern Mongolia and Eastern China. These regions do not have favorable weather conditions and are not attractive for human settlement.

In North America the population mainly gathers in cities on the East of the United States, Canada's South East and the center of Mexico. In South America the main human settlements are in certain regions of Brazil and Argentina. In Brazil, the jungle and the rainforest prevent easy adaptation due to the high temperatures and the humidity, which is why its population is gathered in Rio de Janeiro, Sao Paulo, and its capital Brasilia. In Africa there are not many densely populated areas as a consequence of the great extension of the Sahara and the Kalahari deserts. Some areas that are acknowledged as populated are near the Mediterranean Sea coasts, such as Morocco, Algeria, Tunisia, Egypt and Libya. Countries with a high population density can also be highlighted for their ports, commercial activity or because

Social and Economic Implications of the Population Growth, Composition and Distribution in the World and in Mexico

Some demographers say that the acceleration of demographic growth presents regional problems as opposed to world problems, since there are large parts of the world that are moderately populated or unpopulated, and are not endangered in the short term by overpopulation.

Regions that are densely populated, cause different and serious problems, related to natural resources and society, and consequently, the economy and politics. If any of these elements, regardless of its condition is altered, the others will be altered as well (Fig. 3.4).

they concentrate the most amount of continental water available, such as Lake Victoria, Tanganyika and Albert, as well as other areas such as Nigeria, Cameroon, South Africa, the Democratic Republic of the Congo, Tanzania, Mozambique, Uganda and Kenya.

In Europe there is lower population than in Asia, the Americas and Africa, but its population density is higher than in the Americas and Africa, because the territory is smaller. In spite of the existence of great population concentrations in Europe, its distribution is even because of the location and the proximity of the cities. However, there are areas with a larger population concentration than others, for example London, Berlin, Paris, Frankfurt, Madrid and Milan. The high population density in these cities is due to the fact that there are better job offers and better services than in the rural areas. The European regions where there is a lower population density are in the North part of the continent, in the region that covers countries such as Sweden, Norway and Finland, where polar weather, tundra ecosystem and perpetual ice prevail.

Australia has a much lower population density than Europe with Sydney and Melbourne being the most important cities.

Environmental problems are evident; the transforming of the terrain since the advent of human settlements, the exploitation of minerals and extraction, the cutting of mountains to open new paths and roads, erosion, industrial refuse, and/or household waste, garbage, riverbed deviation, massive phosphate discharges that disturb people, fish production and the entire planet. Finally, the constant loss of vegetation, excessive logging, climate change and acid rain worldwide, affect all the species living on the planet.

A good part of current economic problems come from the demographic explosion that has characterized the evolution of humanity in recent times. This situation is creating the most problems with food, job, energy and availability of infrastructure.

Population growth and the use of technology have altered the balance between the man's needs and Earth's capacity for fulfilling them. Industrialized



FIG. 3.4 The population's excessive growth creates an environmental unbalance.

67

SESSION INFORMATION

Week: 18

Session: 70

Expected learning outcome: Describe the social and economic implications of population growth composition and distribution in the world and in Mexico.

CONTENT DELIVERY

Start: Students should read the section *Population Density and Dispersion in the World and in Mexico*. They will look up terms they do not know.

Development: Students should color the most populated areas in the map mentioned in the text.

Closing: Check students' maps. Elicit information in whole class and take a student's map to verify information and map coloring coincide.

SKILLS DEVELOPMENT

Visual/Spatial skills: Locating information.

EVALUATION OF CONTENT

Check students' maps.

SESSION INFORMATION

Week: 18

Session: 71

Expected learning outcome: Describe the social and economic implications of population growth composition and distribution in the world and in Mexico.

CONTENT DELIVERY

Start: Students should read the section *Social and Economic Implications of Population Growth, Composition and Distribution in the World and in Mexico*, which begins on page 67 and ends on page 69.

Development: In pairs or trios, students should summarize the section to just four to seven lines.

Closing: Check students' summaries. Later on, ask some comprehension-check questions; for example: *Which are three major environmental problems mentioned? Where do current economic problems come from? What have population growth and technology use altered?*

Homework: Students should do research on the three most common social and/or economic implications in their locality or city. They should find the information, which is listed in the section, page 69.

nations, in addition to needing more food, energy and raw materials, have developed lifestyles that depend on looting the natural environment. Pollution is one of the greatest threats to our planet. Not only do we take more than we give back, but we misuse and let waste pollute the air, water and soil. This reduces nature's wealth and variety even more, factors that all human beings depend on. We cannot go back to a preindustrial lifestyle, but we can learn to control the activities of modern society (Fig. 3.5).

Population increase in every region of the world started to heavily pressure the availability of resources. The more the population increases, the more demands and exploitation problems there are, as well as problems of use and application of natural resources, which have an exploitation limit. This has made governments think about implementing a series of measures to stop the growth in regions where it is unsustainable. A series of dispositions were laid out in different demographic policies. Every country organized and implemented their own, according to the socio-demographic and economic profile of their population.

Different countries tried to solve the phenomenon by stopping the population growth. Japan was the first developed country to start a birth control program.

In developing countries, India adopted a policy to decrease its population

growth. The Chinese policy successfully managed to reduce its birth rates as well as the mortality rate.

In Latin America there have been massive information and education campaigns to promote, encourage and spread the importance of birth control and the implementation of programs.

Mexico was labeled a fast demographic growth country from 1900 to 1950 when its population almost doubled. From 1950 to 1970 the same thing happened as a consequence of the decrease in mortality, the increase of life expectancy, the improvement of health services and the increase of social spending. The population increase in our country, as well as in the world, created socioeconomic problems, such as a migratory flow from the countryside to the city, which caused the rural population to decrease and the urban population to increase. Other problems surged from this, for example the excessive growth of cities such as Mexico City, Guadalajara, Monterrey, Puebla, Aguascalientes, Ciudad Juarez and Tijuana.

In 1973 the General Law of Population came into being, changing the previous legislation that had a natalist policy, and implementing an antinatalist goal. This population policy was established with the intention of influencing its volume, growth, structure and distribution, as well as harmonizing the demographic processes with the development and improvement of living



FIG. 3.5 It is very important to stop the pollution of oceans and rivers, as well as air pollution, the excessive logging and to take care of endangered species.



68

SKILLS DEVELOPMENT

Critical thinking skills: Summarizing, remembering.

EVALUATION OF CONTENT

Check students' summaries and ask them questions about the section content.

conditions of all Mexicans through family planning and education programs. The close relationship between the demographic phenomenon and social and economic conditions caused **population policy** to be part of the general development strategy. This strategy has not worked properly in most of the territory, leaving some sectors unaffected due to customs and beliefs.

GLOSSARY
Population policy. Policy which states that resources grow at a slower rate than the population, which is why the disproportionate growth of the latter has to be stopped with appropriate planning.

How much did I learn?

In the following activity you will explain the social and economic implications of the population's growth, its composition and distribution. Copy in your notebook the following chart about the social and economic implications in your neighborhood or locality due to the population's growth, composition and distribution.

Kind	Implications	It is a problem			
		NO	YES	Sometimes	Occasionally
Natural	Altered terrain				
	Contaminated rivers, lakes, lagoons				
	Polluted air				
	Eroded soil				
	Altered flora and fauna				
Social	Lack of housing				
	Lack of green areas				
	Water supply problems				
	Lack of security				
	Overcrowding				
	Land invasion				
Economic	Graffiti				
	Lack of purchasing power				
	Unemployment				
	Poverty				

1. Explain and research the three most common social and or economic implications and how they are present in your neighborhood or locality.
2. Discuss with your classmates some possible solutions to the most important social and economic implications in your neighborhood or locality.
3. Along with your classmates make some banners where you present the solutions to improve the social and economic implications present in your neighborhood or locality.

Kells

SESSION INFORMATION

Week: 18

Session: 72

Expected learning outcome: Describe the social and economic implications of population growth composition and distribution in the world and in Mexico.

CONTENT DELIVERY

Start: Students should be organized in teams in order to do research about their locality. Try to get information about your locality or city yourself to help your students complete the task.

Development: They will complete the chart on page 69 with the research they previously did.

Closing: Check answers in whole class. Help them see why it is important to keep track of such data about their locality or city.

SKILLS DEVELOPMENT

Critical thinking skills: Discriminating information, doing research.

EVALUATION OF CONTENT

Students should show their research paper as well as their chart fully answered.

SESSION INFORMATION

Week: 19

Session: 73

Expected learning outcome: Recognize the social, cultural and economic interactions between the countryside and the cities in the world and in Mexico.

CONTENT DELIVERY

Start: Organize teams. They should complete the introductory activities in the section *How much do you know?* Elicit answers in whole class.

Development: Team working, students should make a contrasting table in which students can clearly see the differences between rural and urban areas using the information they can find on page 70 and at the top of page 71.

Closing: Elicit differences in whole class and if you consider it necessary, have students write the comparative chart on the board.

→ Expected Learning

Recognize the social, cultural and economic interactions between the countryside and the cities in the world and in Mexico.



FIG. 3.6 Migration is a worldwide phenomenon.



FIG. 3.7 Agriculture and livestock breeding are two primary activities in rural communities.

GLOSSARY
Jurisdiction. Authority to rule or apply the laws currently in force.

Social, Cultural and Economic Characteristics in the Rural and Urban Areas of the World and Mexico

How much do you know?

Read the next instructions and complete the activity in your notebook.

1. Make a list of the main differences and similarities between a city and a village.
2. Make a drawing of both a rural and an urban environment with the characteristics you named in your list.

A recent world population trend is the migration from the countryside to the city (FIG. 3.6). Rural population is getting smaller (Table 3.2). The characteristics to distinguish a rural community from an urban community are: the number of inhabitants, the kind of work carried out by the population and the available services (Fig. 3.7).

In some countries the minimal number of inhabitants can vary, but in México the National Institute of Statistics and Geography (INEGI) estimates that rural populations have less than 2,500 inhabitants. In the countryside, the population carries out primary activities such as agriculture, livestock breeding, fishing and forest exploitation. Where the conditions are extreme, they also hunt and harvest. In cities, work is mainly focused on secondary and tertiary activities, that is, in industry, commerce and services.

Country	Minimal population (for an urban population)
Sweden, Denmark	200
South African Republic	500
Australia, Canada	1,000
France, Israel	2,000
United States, Mexico	2,500
Belgium	5,000
Turkey, Spain	10,000
Japan	30,000

Two forms of rural grouping can be distinguished: the concentrated, where all the houses are close to each other and they are surrounded by farmland; and the dispersed, where a house is isolated from others (Fig. 3.8).

In Mexico, the predominant is the concentrated habitat, where the farmer's house is the family home, as well as storage for the harvested goods and tools or refuge for livestock. In most Latin American countries there are certain common characteristics that can be found in rural spaces:

1. Lower income and temporary work.
2. Less infrastructure.
3. Low productivity.
4. Lack of capital.
5. Small property.

Some of the details that distinguish the rural environment are:

Social: the social difference is very light, the social classes are not recognized. Family units tend to be self-governed, which means that the social relations start and end at the town's perimeter. Everyday life is hard, there is a lack of public services and social equipment.

Cultural: a variety of rites and customs, with the goal of clearly expressing the will of the community.

Economic: primary activities predominate and there is a clear tendency towards local consumption.

According to UNESCO: "A city is a human agglomeration characterized by a way of life and lifestyle, generally as a consequence of the kind of activities or work their inhabitants carry out. Cities have more inhabitants than rural areas. They have a larger **jurisdiction**, in terms of administration."

The diversity and heterogeneity that define the urban environment are

TABLE 3.2 Population in urban areas.

70

SKILLS DEVELOPMENT

Critical thinking skills: Contrasting information.

EVALUATION OF CONTENT

Check students contrasting table.

countless. However, some details that differentiate it from other places are: **General** details usually the population density is very high as well as the infrastructure growth.

Social details refer to a fast-paced lifestyle with social and family changes that have happened over a few decades and changed the personal relationships between those living in the city.

Cultural, when there is a high disappearance rate of customs and adoption of new ones and, as a consequence, a weakening of the family

structure and a different appreciation of life and work. (Fig. 3.8).

Economic and political: There are job specializations. In the market economy there are many important commercial exchanges. There is an important political and military purpose.

The urban landscape comprises over 50% of the world wide population. Most of the concentration is in cities of the developed countries; even though some developing countries stand out because of their importance (Fig. 3.9).



FIG. 3.8 Preserving our customs is part of our cultural legacy.

Urbanization Process in the World and in Mexico

Apply your knowledge

Students' own answers

Copy the next chart in your notebook and follow the instructions below.

Elements	Environment	
	Rural	Urban
Inhabitants amount		
Characteristics of geographical space		
Libraries		
Other cultural centers		
Buildings		
Means of transportation		
Lifestyle		
Personal relationships		
Food		
Economic activities		

1. Fill in the characteristics specified, based on what you know.
2. Add to your list other important elements that are not included in the chart.
3. Share the results with your classmates and come up the conclusions. Write them on the board and in your notebook.

Nowadays almost half of the world's population lives in cities. This happens in developed as well as in developing countries.

The regions with a higher urban population are North America (80.7%), South America (81.6%), Europe (72.2%) and Oceania (70.8%). The ones with a lower percentage are located in Africa (35.2%) and Asia (38%) (Map 3.2 on page 66).

The characteristics of the Mexican population suddenly changed from the mid-twentieth century to today. In 1950 65% of the total population was distributed in localities all over the national territory with less than 5,000 inhabitants, and in contrast, the urban population represented only the 25%. That means that in this decade the small town predominated over the cities. The remaining 10% could be classified as mixed. In a very short time the rural



FIG. 3.9 In the city there are economic and cultural activities.

SESSION INFORMATION

Week: 19

Session: 74

Expected learning outcome: Recognize the social, cultural and economic interactions between the countryside and the cities in the world and in Mexico.

CONTENT DELIVERY

Start: Organize pairs or trios. Ask them for some factors that vary in rural and urban areas.

Development: Students should do the activities described in the section *Apply your knowledge*. Check answers in whole class.

Closing: Students should read the information about the urbanization process in the world (at the bottom of page 71). Ask them to guess why most people live in urban areas. Elicit answers. Have a student write the reasons they give on the board.

71

SKILLS DEVELOPMENT

Critical thinking skills: Predicting reasons.

EVALUATION OF CONTENT

Students should actively participate to complete the chart and give reasons why most population lives in urban areas.

SESSION INFORMATION

Week: 19

Session: 75

Expected learning outcome: Recognize the social, cultural and economic interactions between the countryside and the cities in the world and in Mexico.

CONTENT DELIVERY

Start: Students should read the information on how the urbanization process in Mexico occurred. They should start reading about it at the bottom of page 71 and continue on page 72.

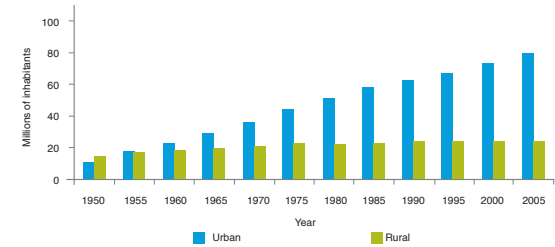
Development: Students should find the answers to the following questionnaire using the text they have just read:

When did the characteristics of population in Mexico suddenly change? Where did most people live in Mexico in 1950? Where do most people live in Oaxaca, Chiapas and Hidalgo? In rural or in urban areas? What do urban areas mainly offer? Mention three examples. Mention the five aspects that define Mexico's population interaction.

Closing: (The answers to the questions are in pages 71 and 72). Check answers in whole class.

population was reduced and the urban population grew, immigration being one of the main causes. In the year 2,000 three out of four people lived in urban areas. In the states of Oaxaca, Chiapas and Hidalgo, less than 50% of the population lives in urban localities. Nowadays, 25% of the population lives in rural localities. 70% of the country's population lives in an urban environment (Chart 3.4).

Due to conditions in the city there are no primary activities such as agriculture or livestock breeding. The work carried out corresponds to the secondary and the tertiary sectors, especially services. A city, according to its functions, influences the surrounding



SOURCE: CONAGUA, Sub department of General Programming. Created from information from INEGI General census and counting.

CHART 3.4 Population in Mexico in rural and urban areas from 1950 to 2005.

Social, Cultural and Economic Interactions among the Rural and Urban Population in the World and in Mexico

territory and the region. The bigger a city is, the more services it offers and, as a consequence, its power of attraction is always higher. The city is attractive for inhabitants of rural areas because they have access to services they do not have in small towns: universities, medical services, specialized services, financial management, shows, museums, etc.; in addition to having more options regarding different goods such as clothing, furniture and electrical appliances (Map 3.2).

The flow from rural areas to urban ones is to acquire goods and services, and to sell the agricultural and livestock products or workforce. This flow can move every day to their workplace, stay for a week in the city or make their home there. Nowadays, facing work instability and temporary work, workers opt for a daily commute from their residence to their workplace.

This structure, especially for Mexico, is defined by:

- a) Big national cities: such as Mexico City, Guadalajara and Monterrey, that spread their influence over national territory.

- b) First order regional cities: they have an influence over a wide regional area and keep a strong bond with the national cities, for example Morelia, Leon and Merida.
- c) Second order regional cities: in them the influence area is smaller than the first order ones, and even though they have some highly specialized services, they are cities with no more than 200,000 inhabitants.
- d) Medium or sub-regional cities: are the one provincial capitals such as Tepic, Oaxaca and Culiacan.
- e) Regional areas: they are centers or county towns where the population goes in search of non-specialized goods and services.

In Mexico, urban space has been expelling industry out of its territory little by little. Industry has been replaced by activities of the tertiary sector such as enterprise management, research and social representation. The building

Kells

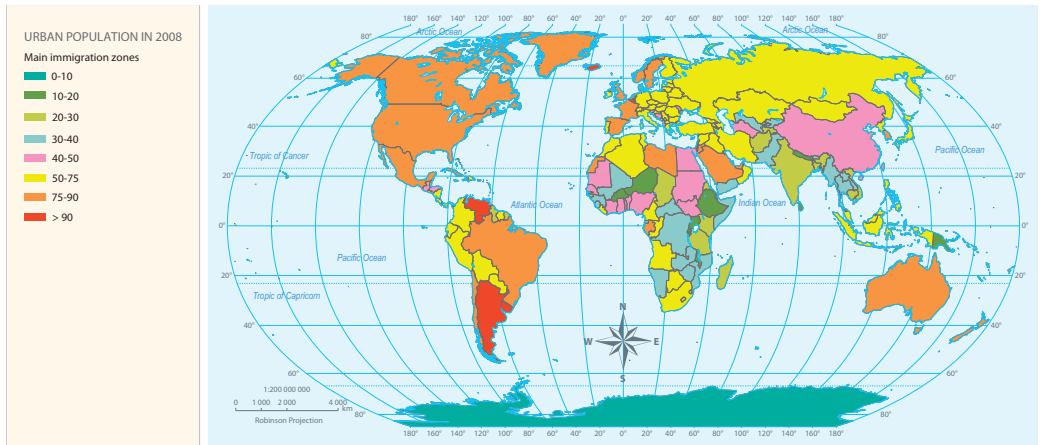
72

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Check students' answers to the questionnaire.



MAP 3.2 World's Urban Population.
SOURCE: *Geografía de México y el Mundo*, Eduardo Pérez Torres, Edición: 2008.

Kells

industry predominates in the cities and in some other places in the country such as Monterrey, Queretaro and Puebla, where almost 75% of the active population works in this sector.

Some of the factors that increase the arrival of new inhabitants to the city have been, and continue to be, the search for jobs, better opportunities, the search for professional studies in a university, to have a direct contact with political forces, etc.

Urbanization comprises different aspects from all the activities of human beings, from geographical, political and economic factors, to cultural and social ones. These factors are necessary for people to live and get along in

the best possible way.

The economic aspect specifically refers to the production infrastructure and commercialization of cities' goods. Production sources can be: factories, industries and supply centers, among others, to carry out different economic activities. The social aspect includes all the different kinds of groups and human conglomerations, hierarchies and the existing levels among the individuals that shape it, education and teaching levels, attitude, beliefs, ideologies and the mindset of the cities' inhabitants.

73

SESSION INFORMATION

Week: 19

Session: 76

Expected learning outcome: Recognize the social, cultural and economic interactions between the countryside and the cities in the world and in Mexico.

CONTENT DELIVERY

Start: Students should read in silence the information on page 73 that starts on page 72.

Development: Individually, they should create a four or five picture cartoon in which they describe why population in Mexico lives now mostly in urban areas.

Closing: Check students' cartoons.

SKILLS DEVELOPMENT

Visual/Spatial skills: Drawing information.

EVALUATION OF CONTENT

Check students' cartoons.

SESSION INFORMATION

Week: 20

Session: 77

Expected learning outcome: Analyze the social problems of the world's population and the population in Mexico.

CONTENT DELIVERY

Start: Students should work in teams. They should answer the questions in the section *How much do you know?* Elicit their answers.

Development: Students should read the information on page 74.

Closing: Ask students to write an essay to answer to the question: How would you reduce poverty in your area if you were a politician? Remind students of the writing process: Pre-writing, drafting, revising, proofreading, and publishing. They should write an argumentative essay using ideas from the text.

→ Expected Learning

Analyze the social problems of the world's population and the population of Mexico.



FIG. 3.10 Poverty in the world is measured under different standards.



FIG. 3.11 Poverty and wealth are also measured by the individuals' freedom of choice.

Poverty and Marginalization of the World's Population and the Population of Mexico

How much do you know?

Answer the following questions in your notebook and discuss them with your teacher and classmates.

1. Think about how you could determine if a person lives in poverty. What would you base it on?
2. Watch one of these videos with your classmates and discuss and analyze the differences between poverty in Mexico and poverty in these regions.
 - a) <https://www.youtube.com/watch?v=98qDo59j0VM/>
 - b) https://www.youtube.com/watch?v=nCnZ36Y_zM#t=31

The concept of human development is centered around the possibilities of choices. The main objective is to know the conditions and the quality of life of individuals in a country and the inequality of that country. This Human Development Index (HDI) is created by factors such as life expectancy, knowledge, education and access to resources, which are necessary to fulfill human potential (Fig. 3.10). To measure inequality, HDI takes into account life expectancy at the time of birth, the literacy rate, school registration and the gross domestic product.

Real poverty is larger than it looks around the world and in Mexico. Gender inequality must be dealt with in terms of human development and in the difference in opportunities between men and women.

Regarding the HDI, it is important to clearly recognize that health, income and education do not reflect all the deprivations that affect individual lives. That is, people also are affected by low self-esteem, psychological damage, social violence and social exclusion.

Poverty must not be seen as exclusive to rural areas, because it is present in the big cities' marginalized zones and in the lack of job opportunities (Fig. 3.11).

There are different causes for poverty and among them there are political problems, financial markets' crisis, natural disasters, copying of foreign social and economic models, inadequate management of the environment and misuse of natural resources by society.

There are even different methods to measure the planet's poverty population. Some use economic indicators and others take into account vital aspects such as life expectancy, daily calorie intake, educational aspects such

as illiteracy and the access to basic education. Every one of these indicators offers advantages and disadvantages, and their use depends on the purpose.

The world, in a material sense, is divided into two blocks. The first one is made up by countries and regions possessing the lowest Social Exclusion Rates (SER) and the second one, by countries with higher social exclusion (Table 3.3).

It should be pointed out that the fact that industrialized countries reach the lowest percentages of poverty does not mean that they do not have it: poverty is a worldwide problem. What happens in these countries is that most of the population is not poor and most of them have access to decent living conditions. By contrast, in the developing countries there is a very evident social difference.

In the world, most poor people still live in rural areas, but this situation is not exclusive, it is changing and probably in the twenty first century they will live in cities. This process will be the result of migration to urban areas, lower access to productive resources, insufficient development, urban living, physical infrastructure, etc.

On the other hand, social marginalization is defined by UNESCO as the exclusion of certain individuals, or groups in relation to certain aspects of interaction. In Latin America it refers to problems associated to urban development, such as lack of housing that causes marginal urban settlements: "slums", shanty towns, skid rows, etc.

In Mexico many settlements are known as misery belts. It refers to the sectors of the population segregated in areas not included in the urban service system, improvised housing and on illegally occupied

74

SKILLS DEVELOPMENT

Verbal/Linguistic skills: Discussing.

Writing skills: Writing process.

EVALUATION OF CONTENT

Check students' essays.

TABLE 3.3 According to this table, poverty affects a quarter of the population in the developing world.

	Number of poor people (millions.)			Poverty rate (% of the population.)		
	2005	2010	2015	2005	2010	2015
East Asia	304.5	140.4	53.4	16.8%	7.4%	2.7%
Europe and Central Asia	16.0	8.4	4.3	3.4%	1.8%	0.9%
Latin America and the Caribbean	45.0	35.0	27.3	8.4%	6.2%	4.5%
Middle East and North Africa	9.4	6.7	5.4	3.8%	2.5%	1.9%
South Asia	583.4	317.9	145.2	40.2%	20.3%	8.7%
Sub Saharan Africa	379.5	369.9	349.9	54.5%	46.9%	39.9%
The world.	1337.8	878.2	585.5	25.7%	15.8%	9.9%

MAP 3.3 Comparison of infant malnutrition in Mexico and in other parts of the world.

SOURCE: Proprietary production based on Eduardo Pérez Torres, Edfringe.



Malnutrition and Hunger of World Population and the Population of Mexico

Population and nutritional changes are closely related in several ways. Good nutrition lowers the maternal and infant mortality and leads to an improvement in survival. For several reasons, well nourished mothers have a greater possibility of surviving child birth and having healthier children.

Babies who receive good nutrition have greater chances of surviving, and the severely malnourished have an 8 times greater chance of dying than the well-nourished children fed with infant formula (Map 3.3).

Nutrition affects population growth as well as reproductive health, in the same way that demographic changes damage people's nutritional state. In many developing countries the increase in the population threatens the availability of food, especially in the ones where the population will double in the next 20 to 25 years.

To Learn More

Look up on this website the economic indicators of Mexico and many other countries. <http://datos.bancomundial.org/pais/mexico>

75

SESSION INFORMATION

Week: 20

Session: 78

Expected learning outcome: Analyze the social problems of the world's population and the population in Mexico.

CONTENT DELIVERY

Start: Students should read page 75. Have students look up words they do not know. Then, organize teams of five students.

Development: Teams should roleplay: The committee against hunger in Mexico. They will play the following roles: The president of Mexico, a bank representative, a large corporation representative, the secretary of economy and the city mayor. Each committee should discuss a real solution to hunger in Mexico.

Closing: Listen to every committee representative and choose the best solution.

SKILLS DEVELOPMENT

Intrapersonal skills: Discussing.

Interpersonal skills: Developing an opinion.

EVALUATION OF CONTENT

Check that students actively participate in the committees.

SESSION INFORMATION

Week: 20

Session: 79

Expected learning outcome: Analyze the social problems of the world's population and the population in Mexico.

CONTENT DELIVERY

Start: Ask students if they know what discrimination is. Elicit answers and then contrast them with the definition on the book.

Development: Students should read the section *Discrimination and Social Injustice in the World and in Mexico* and make a glossary of terms.

Closing: Check students' glossary of terms.

To Learn More

Discrimination refers to any distinction, exclusion, restriction or preference based on race, color, descent or national or ethnic origin with the intent of nullifying or impairing the recognition, enjoyment or exercise, on an equal footing, of human rights and fundamental freedoms in any area of life.



FIG. 3.12 As human beings we are physical and emotionally unique.

Undoubtedly, the population growth is linked to the increase of urbanization. By the year 2020 malnutrition of the urban population of the developing countries can double. There are demographic changes that affect the quality of life of the population as well as their nutritional state. In addition, the transition to highly processed foods and almost non-existent

Discrimination and Social Injustice in the World and in Mexico

Discrimination entails unjust elements, because the abused have their rights infringed and they are deprived of common benefits. Among the many shapes social discrimination can take, segregation is one of them. It consists of prohibiting certain human groups to carry out certain activities, the confinement of segregated groups to a certain kind of labor and the creation of social prejudices. Segregation is a manifestation of fear of the different. The message that society sends when there is discrimination, is that difference can be maintained as long as it does not interact with the dominant culture.

In Mexico, as well as in the rest of the world, many centuries of isolation have allowed the preservation of traditions, customs and indigenous languages, but the access to basic and social services has been low in the isolated towns of Mexico. Abandonment is one way of showing fear of what is different, and a way of legalizing it. The reason for underdevelopment and poverty is ignorance and sometimes it seems that being indigenous equals poverty, which, of course, is not true. Most of the governments of the world acknowledge the debt they have with ethnic groups. Historically, they should have been included as part

physical activity worsen the aging effects. Many of the current diseases are linked to the eating habits, with obesity as a result, which affects 250 million people around the whole world, in addition to cancer, diabetes and coronary diseases that are becoming more common in developing countries.

of national development, and therefore, they made the decision to integrate them into national life. The clearest example of this policy is in the education sector. After the revolution in México, it was decided to Hispanicize the indigenous people, in order for them to forget their language and, along with it, their culture so they could then overcome obstacles and be benefitted by development. Nowadays educational programs try to save the original language of the people they educate under the concept of plurality and social equity (Fig. 3.12).

The fight against racism, discrimination and xenophobia has been one of the permanent objectives of the United Nations organizations as part of the protection of the human rights. The United Nations Charter declared non discrimination as a key principle for human coexistence, promoting a new ethic throughout the recent decades in culture, government policies and collective action of the different groups in the society.

Racial discrimination is all that expresses a distinction, exclusion, restriction or preference based on race, color, descent or national or ethnic origin, which has the purpose of nullifying or impairing the recognition, enjoyment or exercise, of human rights and fundamental freedoms in the political, economic, social, cultural or any other field of public life.

Apply your knowledge

Work in teams of four and develop the following activity in your notebook.

1. Go to your closest health center and ask for some flyers that talk about malnutrition and the chart of good nutrition, where there are the different groups of food. Analyze every one of them and try to balance the food in order to get the proper diet for a pregnant woman and for a senior citizen. It must include breakfast, lunch and dinner. If you cannot get the information, you can look it up on the Internet.
2. Compare both diets and describe if they are the same.
3. Discuss with your classmates about the importance of knowing how to choose the right food. Write the conclusions in your notebook.
4. Write a recommended diet for yourself.

76

SKILLS DEVELOPMENT

Critical thinking skills: Defining concepts.

EVALUATION OF CONTENT

Students should get their glossary of terms checked by the teacher.

Migration Trends in the World

How much do you know?

Answer the following questions in your notebook and discuss your answer with the rest of your classmates.

1. Have you ever lived in another country, state or city? Explain where and why you lived there.
2. If you had to migrate to another place or country where would you go and why?

Migration is defined as the movement of the population from one place to another; this means that when a person or a group of people leave their place of origin, they emigrate; and when they arrive in another country and establish themselves, they immigrate. The route the emigrants follow is called *migration route* or *migration flow*.

The causes that lead the population to emigrate from their place of origin are different, however, one of the main reasons is the lack of work and the search for better standards of living, which brings other social problems, to the place they leave as well as to the place they arrive. Migrations can be internal or national, when they happen within the same country, or external or international when they move abroad.

Towards the mid-60s, the migration flow was characterized by the interruption of the previous trends. Migration happened not only from Europe to the ancient colonies, but it also happened globally, with the migration of Europeans to other developing countries. From 1945 to 1973 the economic height encouraged a massive labor migration. From the underdeveloped regions towards Western Europe, North America and Australia. In the mid-70s, capital investment moved away from traditional centers, and the old industrial countries experienced new kinds of income flow at the same time new immigration surged in Southern

Europe, most of whom were of Latin American, African or Asian origin.

In the 80s and 90s, emigrant flows from developing countries towards the developed ones quickly increased. However, restrictive policies that try to limit this kind of migration have been a priority in developing countries.

In 1990 the international migrants represented 4.5% of developed countries' population, and 1.6% of developing countries. In 2000 around 175 million people were living in a different country than the one they were born in, which is equal to 3% of the world population. 60% of immigrants nowadays live in more developed regions. Most of them live in Europe, Asia and North America. One of every 10 people living in more developed regions, is a migrant, while one in every 70 people who live in the developing countries, is an immigrant.

Current migration flows are influenced by globalization conditions, as well as a series of problems regarding job creation, poverty, as well as social and demographic vulnerability. There is a growing diversification related to the nature of the immigrant: temporary migrants and the ones who are not. The latter can be classified in different categories, such as economic migrants, qualified workers, without legal status, war refugees, displaced, political exiles, and even environmental immigrants.

→ Expected Learning

Analyze the social, cultural, economic and political causes and consequences of migration around the world and in Mexico.

SESSION INFORMATION

Week: 20

Session: 80

Expected learning outcome: Analyze the social, cultural, economic and political causes and consequences of migration around the world and in Mexico.

CONTENT DELIVERY

Start: In pairs, students should ask and answer the introductory questions. Elicit answers.

Development: Students should read the section *Migration Trends in the World*. Students should mind map the information about Migration.

Closing: Check students mind maps. Then, have students discuss the questions in the section *Apply your Knowledge*.

Apply your knowledge

Work in groups and follow the instructions to do the next activity. Write the answers in your notebook.

1. Do you know anyone in your family who had to migrate to other city or country? What were the reasons and consequences of it?
2. If you had to migrate to another country, where would you go? Why? Share your work with the rest of your classmates and teacher.

SKILLS DEVELOPMENT

Critical thinking skills: Mind mapping.

EVALUATION OF CONTENT

Students should get their mind map checked by the teacher.

SESSION INFORMATION

Week: 21

Session: 81

Expected learning outcome: Analyze the social, cultural, economic and political causes and consequences of migration around the world and in Mexico.

CONTENT DELIVERY

Start: Students should read page 78 and half of page 79. Later, if necessary, they should look up any word they do not know.

Development: Organize teams of five people. Teams should create a rap or song or rhyme about migration using information from the text.

Closing: Each team should present their rap or song or rhyme.

Homework: Students should take a device with Internet access to the following class.

Main Migration Flows in the World

Nowadays, the main migration routes follow a well defined direction, that is mainly due to the location of temperate and cold zones of developed countries. People move out of Africa towards Europe, with the main receiving countries being Germany, the United Kingdom and Spain; and from Latin America including Mexico, Central America, the Antilles, South America, Asia and Europe, the main receiving country is the United States of America.

According to the census in the year 2000, the population of Latin origin in the United States was over 33 million inhabitants, out of which 18 million are of Mexican origin. It is known that the volume of illegal people in the United States has been one of the main issues that worry that nation and Mexico. Most of the workers work in the agricultural sector, such as cereal, vegetables and greens.

The low salaries paid to our illegal countrymen have allowed the prices of certain products to not increase excessively, and keep their utility margins. The illegal immigrant does not create conflicts with the employer, does not have a labor union to protest, does not have any wage or social demand, and is able to adopt an attitude of resignation or subordination for fear of being deported.

In the case of Mexico, the study of migrations has become important because of the level of economic development achieved by the country and the great migration flows created in recent decades. The origins are localities or small cities, and the destinations are big cities or the main cities in each state (Chart 3.5 on page 79).

Social, Cultural, Economic and Political Causes and Consequences of Migration in the World and in Mexico

GLOSSARY

Xenophobia. Hatred, disgust, hostility towards foreigners.



FIG. 3.13 National Population Council.

Whatever the forces that determine concrete migration flows, they are complex and varied. Even though migration corresponds to a small portion of the population, it is a phenomenon that impacts both the country of origin and the arrival place, the communities and the people directly involved with the migrant and their family.

The increasing restrictions for migrants' entrance, the discrimination they suffer in the arrival society and the difficulties they face in order to exercise their rights, are some of the elements that prevent the development of favorable conditions for immigrants.

Not all immigrants converge in the occupational pyramid. There is an important number of highly qualified workers, who are employed by big corporations, enterprises and industries. The benefits for both parties are widely known. The interpretation of the high social and economic costs that the brain drain means for the source countries has led to a more positive view, according to which these immigrants can become a kind of bridge for technology from the developed world to reach the underdeveloped economies.

Another element of interest within the economic dimension, is the sending of remittances, which have an impact on the maintenance and on the increase of consumption levels of the receiving families.

In cultural terms, one of the subjects that has attracted more academics, political and social interest and concern, is related to the xenophobic attitudes and behavior against the immigrant population, especially against the one that has managed to become a community within receiving societies. **Xenophobia** and hostility occur every so often, especially when the economic situation worsens or insecurity increases.

One of the most important subjects is the one related to human and citizen rights of foreigners, who are acknowledged or rejected by the states whose territories they live in. The condition of the immigrant as a foreigner creates an undeniable exposure to vulnerability, and it has a more critical expression in the absence of rights that affect irregular immigrants in general, affecting women and minors the most. According to the National Population Council, Conapo, (Fig. 3.13) and the United Nations Fund the main causes for international migration are:

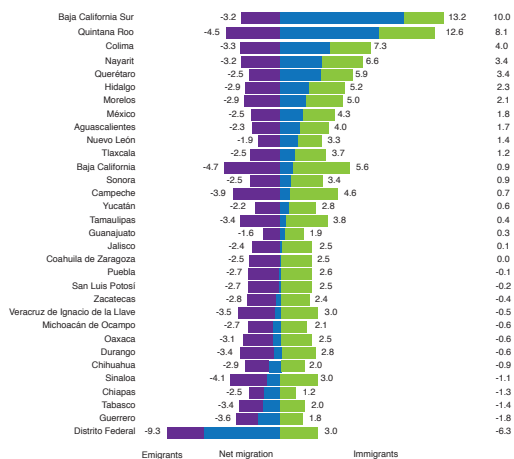
78

SKILLS DEVELOPMENT

Musical skills: Singing, rapping.

EVALUATION OF CONTENT

Students should actively participate in the song creation.



1. The search of a better life for a person and his/her family.
2. The income disparity between the different regions.
3. The labor and migratory policies in the countries of origin and destination.
4. Social, political or religious conflicts.
5. Degradation of the environment, which includes the loss of the croplands, forests and pasture.

According to the National Population Council, the main causes that lead to international migration of Mexicans to the United States are:

- a) Factors linked to offer-sending of workforce.
- b) Factors associated to demand-attraction.
- c) Social factors that link the migrant to family, friends, communities of origin and destination.

CHART 3.5 Percentage of immigrants, emigrants and the net migration by federal entity (migration for place of residence five years prior).

How much did I learn?

In the following activity you will analyze the social, cultural, economic and political causes and consequences of migration.

Work in teams of five and do the next activity following the instructions given and write your results in your notebook.

1. Analyze the social, cultural, economic and political causes and consequences of some migrants who illegally cross the borders:
 - a) Go to your local newspaper library, look up the news on the Internet or ask your teacher for the requested information. Select two or three of them.
 - b) Write the title(s) of the news, the name of the newspaper, the date, the agency and any other information that refers to the article.
 - c) Explore in the information: which were the causes that led the migrants to move to their destination, how did they move, how were they found, how were they treated and how their issue was resolved.
 - d) Research the new anti-immigration laws applied in the United States, such as the SB 1070 and later ones. Analyze their consequences.
 - e) Research the treatment Mexican immigrants receive when they cross the border to the United States, and they are detained by immigration agents and compare it to the treatment Central American people receive when they cross the Southern border of our country. Share your opinions.

Discuss your results with the rest of your classmates and your teacher.

SESSION INFORMATION

Week: 21

Session: 82

Expected learning outcome: Analyze the social, cultural, economic and political causes and consequences of migration around the world and in Mexico.

CONTENT DELIVERY

Start: Ask students what the difference is between emigrants and immigrants. (Emigrants leave from a country, immigrants move into a country).

Development: Students should do the activities in the section *How much did I learn?* Using the device with Internet access.

Closing: Students should hand in their research and conclusions report.

Homework: Organize teams of three or four students. Teams should get pictures showing cultural diversity in Mexico, a piece of cardboard, glue, scissors and markers.

79

SKILLS DEVELOPMENT

Critical thinking skills: Doing research, discriminating information.

EVALUATION OF CONTENT

Students should get their report checked by the teacher.

SESSION INFORMATION

Week: 21

Session: 83

Expected learning outcome: Appreciate the cultural diversity from the world in Mexico, as well as the importance of the intercultural coexistence.

CONTENT DELIVERY

Start: Students should read page 80. If necessary, they should look up words they do not know.

Development: In teams, students will make a poster showing cultural diversity in Mexico.

Closing: Check teams' posters. They should display them around the classroom.

Presentation preparation: Organize four teams. Divide the information on pages 81 and 82 into four parts. Each team will be presenting a segment the following two classes. (Two teams each class). They should present the information in the text and do extra research. Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

→ Expected Learning

Appreciate the cultural diversity from the world in Mexico, as well as the importance of the intercultural coexistence.



FIG. 3.14 Individuals from different cultures.

80

Cultural Diversity of the World Population: Traditional, Contemporary and Emerging Cultures

How much do you know?

Read the following questions and answer them in your notebook.

1. Observe and analyze the three images in Fig. 3.14.
 - Do you think they all speak the same language? Why?
 - Which country do you think they are from? Do you think they are from our culture? Why do you think that?
 - Do you think they practice the same religion? What do you base your conclusions on?
 - What do you think their daily customs are? Do you think you could coexist with these three people, in a specific place of the planet? Explain your answer.
2. Share your answers with two of your classmates.

The term cultural diversity has been used as a reference to the diversity within a given cultural system, to designate the great variety of sub-cultures or sub-populations of variable dimensions, who share a group of fundamental ideas and values. This concept has been used in Mexico referring to the social mix, to describe the coexistence of different cultural systems, or at least the existence of important social groups within the same geo-political borders.

Contemporary culture comes from the traditional, but the metropolis and modernity absorb it and it is adapted to individual idiosyncrasies. The rising culture, strictly speaking, is a trend. Every era has its own culture that is differentiated from others and disappear. The current one is focused on the use of technological advances and innovations, it is present mostly in developed countries and among people with higher income. Every one

of the planet's cultures is a mosaic of knowledge giving the world the opportunity of diversity.

Mexico is the place of origin of very different indigenous and cultural groups than can be clearly differentiated, not only by their varied social elements, such as their traditional outfits, housing, religious customs or cuisine, but also by something more conclusive and evident, the language. When a culture starts to be lost or blended, the first thing that starts to disappear is the language: that is why, the permanence of the local language is the best indicator of the survival of a town, with its original characteristics.

Mexico is still one of the main countries in the world regarding cultural diversity, with 62 indigenous living languages, reflecting the amazing survival of ancient cultures, some several centuries old, some even millenniums old (Map 3.4).

Apply your knowledge

Read the next instructions and draw a chart to show your answers.

1. Research the Spanish meaning of the following words (maybe you can ask your Spanish or language teacher for help):
 - a) Centli, in Nahuatl: c) Xál, in Mam: e) Nál, in Mayan:
 - b) Zuba, in Zapotec: d) Mok, in Zoque:
2. Do the opposite: look for the Spanish meaning of words we see every day:
 - a) Chapultepec:
 - b) Mariposa (Butterfly):
 - c) Xochimilco:

Kells

SKILLS DEVELOPMENT

Visual/Spatial skills: Creating visual representations of a topic.

EVALUATION OF CONTENT

Students should actively participate in the poster creation.

Multiculturalism as a Current Condition of the World and in Mexico

Globalization makes it possible to be in touch with different cultures of the planet. Through this daily and frequent contact with diversity, subconscious processes happen in the populations, which leads to the acknowledgement of the existence of different cultures other than your own. Gradually, society is opening to the existence of diversity. Globalization seems to impose a unique production, consumption, and entertainment model, that while creating a natural reaction in the population, doesn't renounce the benefits the imposed model brings and expresses. A counterpart of globalization is the manifestation of diversity: multiculturalism.

Resolution of conflict has been a need of the world throughout history. At this point, the change and diversity must be managed to avoid conflict and negativity. Social dynamism and transformation must be allowed so that no conflict becomes violent.

Multicultural coexistence requires complex thinking in the search to find solutions. Mexico is defined as a pluricultural country in its Political Constitution of 1992. The 2nd article determines that the nation is a pluricultural composition, originally supported by its indigenous people that descend from populations that inhabited the current country's territory

at the time of colonization and that kept their own social, economic, cultural and political institutions, or part of them. Awareness of indigenous identity should be fundamental in determining to whom the provisions on indigenous criteria apply.

In spite of all that has been said, multiculturalism does not satisfy us completely, since it is a descriptive concept that only points out that in a certain territory, groups with different cultures coexist, but the concept does not concern the relationship between them. Mexico's history is well known, in part, due to its culture evolution and the indigenous participation. But we can still find groups that do not understand this and seek to exploit and discriminate. Mexico might be multicultural, but at the same time, it could be seen as racist.

Interculturality refers precisely to the relation between cultural groups, and supposes a relationship based on respect with equality and legal responsibility. Interculturality does not allow asymmetry, that is to say, inequality between cultures measured by power that benefits one cultural group over another. As an aspiration, interculturality must always be part of the national project.

The Importance of Intercultural Coexistence

Culture is conceived not only as a group of visible factors such as language, geographical origin, ethnicity, etc., but it includes other elements of cognitive and affective nature that interest the person, their identity, behavior and judgment. Both in relation to themselves as well as in relation to the interaction with nature and other people. For the same reason, it is very important that interculturality is not limited to the productive context. Education, social and sanitary intervention, even non-profit organizations, are environments where goals are set and professional activities are carried out. When said activities affect

people from different cultures, intercultural relationships are created so intercultural coexistence becomes a basic factor.

It is evident that a multicultural country that aspires to democracy cannot fully achieve it if it does not go through multiculturalism and interculturality. This is because democracy implies pluralism, tolerance, which is the opposite of racism, and other deeper values such as respect and appreciation of differences.

Intercultural integration is easier to achieve when the members of the dominant culture allow the groups of the non-dominant culture to

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SESSION INFORMATION

Week: 21

Session: 84

Expected learning outcome: Appreciate the cultural diversity from the world in Mexico, as well as the importance of the intercultural coexistence.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

SESSION INFORMATION

Week: 22

Session: 85

Expected learning outcome: Appreciate the cultural diversity from the world in Mexico, as well as the importance of the intercultural coexistence.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

Homework: Individually, students will do some research interviewing six people. The entire research project is described on page 83, in the section *How much do you know?* On top of the page.



keep their own cultural heritage, and when they encourage and allow them to become an active part of society, and creating relationships with them. From the non-dominant group's perspective, integration is easier when its members are interested in keeping their own roots and cultural identity, and at the same time support and reinforce the creation of relationships with the dominant group.

This way, when there is intercultural coexistence, the members of a society feel culturally, psychologically and socially included; they enjoy a legal, fair and equal labor situation; they practice and carry out enterprise policies that safeguard the struggle against racist or discriminatory actions. The members of the groups enjoy an equal status and negative and prejudicial stereotypes presence are reduced. When there is a high acceptance level, there is cooperation to meet the needs of the different social Map 3.4 shows indigenous regions in México.

MAP 3.4 Indigenous regions in Mexico.
SOURCE: Proprietary production based on Eduardo Pérez Torres, Geografía de México y del Mundo, Esfinge, 2005.

Kells

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SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Cultural Homogenization Trends Influenced by Advertising in the Mass Media

How much do you know?

Read the following instructions and develop the research in your notebook.

1. Interview two senior citizens (the older the better), two adults and two teenagers. Before the interview, you must write down the name of the interviewed person and their age.
2. Write and ask questions that include the following elements: games they played in their childhood, places where they played, toys they had, their way of communicating with people from other countries, and which tools they used to research information for their homework. Write your conclusions and share them with your own family and the rest of your classmates.

We have mentioned that the current "globalization" phenomenon has been forced by the technological revolution and information technology in communications and has broken cultural borders and crossed state and national borders with a kind of "homogenization." These changes threaten to replace or dismiss the national and cultural traditions of the world through which people have identified. We can confirm our similarities and differences with other people, in our aspirations and problems. We can identify ourselves as an American social group going from Peru to Mexico, we can discover that change in social processes, such as the fall of the Soviet

block, coincide with the surge of a new kind of demand, and that despite the great difference in accents, perspectives and customs, social and cultural diversity turn around the subject of identity, both nationally and locally.

The effects of globalization in our lives have been of great help through multiple means of communication such as radio, television and technological means such as the Internet. Cultural homogenization of a society may have several factors: the influence of mass media in constant search for consumption and waste; the emulation of economic systems and lifestyles that are inefficient and ineffective; the revaluation and reinterpretation of

Apply your knowledge

Introductory note.

In this activity you will interview members of your family or friends to find out about the manifestations of cultural changes as you have grown up. You are now part of a cultural homogenization, a consequence of mass media influence.

Read the following instructions and do the activity in your notebook.

1. Prepare some questions like the following: Which are your favorite actors and actresses and what is their nationality? What is your favorite music band or musician and where are they from? Who is your favorite painter or sculptor and what nationality are they? Which traditions or festivities do you like the most and what are their origins? Do you have a favorite sports team or player? Who is it?
2. Interview two senior citizens (the older the better), two adults and two teenagers. Write their names and their age.
3. Identify if their answers correspond and belong to national or foreign cultures. How do you think they know these actors, players, bands, etc? Do you think mass media has influenced in their choices? Write your conclusions in your notebook and share them with the rest of your classmates.

→ Expected Learning

Distinguish the elements that affect the changes in cultural manifestations of the world population and Mexico.

SESSION INFORMATION

Week: 22

Session: 86

Expected learning outcome: Appreciate the cultural diversity from the world in Mexico, as well as the importance of the intercultural coexistence.

CONTENT DELIVERY

Start: Organize teams of four people. Students should share the results they got in their interviews and graph it if possible.

Development: Students should read the information on page 83 and top of page 84. Discuss it with students.

Closing: Students should do the project described in the section *Apply your knowledge* interviewing school personnel and students from other classrooms.

Homework: Students should take a device with Internet access.

83

SKILLS DEVELOPMENT

Interpersonal skills: Interviewing.

EVALUATION OF CONTENT

Students should actively participate in the interviews; check their research interviews.

SESSION INFORMATION

Week: 22

Session: 87

Expected learning outcome: Distinguish the elements that affect the changes in cultural manifestations of the world population and Mexico.

CONTENT DELIVERY

Start: Students should work in teams of four. Ask somebody to read the activities in the section *Apply your knowledge*. Explain what students need to do carefully.

Development: Students should do the activities by doing research using Internet.

Closing: Students should provide with ways to change the nativity set by using elements from different cultures.

Homework: Students should take to class a device with Internet access.

To Learn More

Acculturation is the process where one's culture is changed by another, leading to disliking one's own culture and rebuilding identity.

local and universal values; acculturation as a sign of the loss of identity, etc. These universal facts imprint a radical change for people and for societies. The demands of society are no longer about ideological thinking, but are specific demands that affect the legitimacy of perceptions about politics, their diagnosis and solutions. In order to technologically advance in globalized societies, it will be necessary to take full advantage of the opportunities. There are some cultural homogenization trends from the influence of advertisement on the mass media. Multiculturalism and globalization are

the cause of several ethnic problems in the world, but they are also the main reason of the re-emergence of cultural and social identity. The current subject of international debates about culture is about guaranteeing the survival of cultural diversity, in spite of the dangers and influence of the great amount of information created every day. This way, evolution of the information society and communication must respect and encourage cultures and their distinctive natures to survive, even though the idea of homogenization is still attractive and acceptable.

Apply your knowledge

Work in teams of four. Read the next instructions and develop the activity in your notebook.

1. Write which Chinese, Peruvian, Spanish, Cuban, Egyptian elements you would include in an altar for the Day of the Dead. Describe each of them.
2. Which elements you would include in the Día de la Candelaria in Tlacotalpan, Veracruz. The Virgin is carried beside the Papaloapan river along with a procession of small boats and canoes as people toss flowers and water balloons to lead the ferry to a sacred altar. In the town there is a commercial fair with local music, bullfights, shows and open-air dances. Write which elements from Guatemala, Brazil, France and Japan you would include to this celebration without altering it very much. Describe each of the elements.
3. Research which Chilean, German, British and Lebanese elements you could include in Mexican Nativity displays. Describe each of them.
4. Point out which Mexican elements you would set on a Christmas tree, without altering its meaning. Write your conclusions on the cultural manifestations of the population and share them with the rest of your classmates.

Changes in Cultural Manifestations of the Population of the World and in Mexico

Today there is a gradual homogenization and change in the way we perceive the world which is more evident when we talk about different generations all over the world. The acceptance of foreign elements in the culture is easier for younger generations. People were previously reluctant to change traditions and values, but not now, according to the vision of life and needs.

The cultural consequences of globalization are also noticeable. The most distinctive sign has been the import and export of customs that are reflected in language, music, food and other cultural forms that include knowledge, internalization, evaluation, identification and dynamic management of the culture values.

We can find several processes and customs that transcend the barriers between cultures, thanks to globalization. But it usually turns out that, this transcendence ends up being a transformation and a reinterpretation of new symbols. For example, in the transfer of a celebration from one culture to another, the essence of the rites is not transmitted in the same way and with the same values. The celebration's structure regarding how, where, how much and why vary according to the culture. Some examples of this: Christmas, Easter, the Day of the Dead and Halloween, among others. Globalization leads to the reinterpretation of ancient signs, symbols, customs and reevaluation of others than can be local or global.

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SKILLS DEVELOPMENT

Critical thinking skills: Doing research, discriminating information.

EVALUATION OF CONTENT

Students should actively participate in the proposals to enrich Mexican festivities.

For this to happen, there must be an influence of an ideological current, consistent and persistent regarding another culture.

Acculturation is also considered a process through which the construction of a culture is greatly determined by the society it grew in. Societies, through globalization, have been tearing down borders and creating parallel global societies, where frequently the great powers influence the smaller countries.

Now it is safe to say that the globalization process is not caused by socio-

cultural homogenization as it had been foreseen, but it is accompanied by the noticeable rebirth of the world's identities. Sometimes this identity is shown under the shape of national cultural, ethnic, religious, or regional fights, intensely and in variable scales. Political conflicts at a world level always emerge influenced by the socio-cultural differences. These conflicts are caused by economic disputes and fights over the control of territories and resources.

To Learn More

The importance of the local cultures in the face of cultural homogenization process.

The Importance of Local Cultures that Face Cultural Equalization Processes

Local cultures are key parts of the planet's biodiversity, appearing as a group as well as individuals. From their previous belongings, communities or societies, each of them has unique values, motivations and traditional duties. Globalization does not mean the disappearance of this cultural biodiversity, but it tries to keep, start and make bridges such as the "universality" that globalization suggests. This same liberalism is where the State promises to safeguard the survival and development of the different national groups,

cultures or religions, and from which said communities can eventually choose a liberalism that establishes the common wellbeing, quality of life and universal rights.

We must think about the existence of difficulties when trying to establish bridges between globalized economic development, the educational systems and the access to technology and its benefits with multiple cultures coexisting in the same space. Sometimes these bridges do not exist due to high competitiveness and human indifference. Globalization and economic and market success are utilitarian concepts that subdue and even threaten the social survival of "multi" or "pluriculturalism", which sometimes can be of the same excluding economic nature, allowing the emergence of conflicts around national identity.

How much did I learn?

With the following activity you will distinguish factors that affect the changes in the cultural manifestations of the population. Read the following statements and write the answers in your notebook.

1. Make a list of five Mexican festivities and their equivalents in other countries or cultures in around the world.
2. Do some research on the origin of these festivities and write a short description of them.
3. With two of your classmates analyze and discuss if globalization could end a country's culture and traditions and explain the differences between acculturation and intercultural. Write your conclusions in your notebook.

SESSION INFORMATION

Week: 22

Session: 88

Expected learning outcome: Distinguish the elements that affect the changes in cultural manifestations of the world population and Mexico.

CONTENT DELIVERY

Start: Divide students into two large teams. Team 1 will read *Changes in Cultural Manifestations of the Population of the world and in Mexico* whereas team 2 will read *The Importance of Local Cultures that Face Cultural Equalization Processes*. Once they finish, they should look up terms they do not know.

Development: Students should work in pairs, each person will work with someone from the other team. Then, they will tell their partner the summary of the information they read. Pairs should write a summary of the information they got.

Closing: In teams, students should do the activities described in the section *How much did I learn?* Elicit answers.

SKILLS DEVELOPMENT

Interpersonal skills: Teaching others.

Critical thinking skills: Remembering.

EVALUATION OF CONTENT

Eliciting answers in the final activity will clearly demonstrate whether they reached the learning outcome or not.

SESSION INFORMATION

Week: 23

Sessions: 89 - 92

Expected learning outcome: Apply information of the unit to develop and present a project.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

Project

Interaction of the World's Population

The project in this unit aims at helping you work, research, develop and present a situation that deals with the social, cultural, political and economic interaction of the world's population; its growth, composition, distribution and influence on your community. Read the following text which offers you a situation that you can use as an example to develop your project. Remember to follow the steps included in the project in unit 1 (pages 32 and 33); start with a question to foster curiosity, research the topic to increase knowledge, develop all possible scenarios resulting from your research, present your work and always look for your project to provide benefits to your community.

→ Reading

The Wall. Mexico/United States.

In Naco, Arizona and Naco, Sonora live 800 and 8,000 people respectively. Both cities live under the shadow of a 4-meter high steel wall, both communities are bilingual and have family ties on both sides of the border.

The border between Mexico and the United States has always been closely guarded by both countries. At first, Mexicans were able to move to the North at will. The flow of illegal immigrants increased noticeably after the approval of the North American Free Trade Agreement in the 90s. The result? Naco was invaded by immigrants on their way to the North. After that, the Wall

arrived in 1996 and the flow of people spread towards the desert, out of the town. After September 2001, the United States' government decided to close entries from Mexico.

People from Naco, Sonora, conceive a reality that American legislators do not understand: the simple fact of crossing that line improves a person's income 10 times. Everyone knows that the wall is a police solution to an economic problem. Mexicans will jump over it, dig under it or make holes in it, but in the end, life continues on both sides.

Source: National Geographical, in Spanish, May 2007

El Muro incómodo (adaptation).



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SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Evaluation

What I have learned

Read carefully the following questions and answer them.

- Mention two implications or consequences of population growth.
There is more demand of services, food, use of natural resources, water, work opportunities, etc.
- Describe how social and economic interactions happen between rural areas and the city.
In the countryside, the population carries out primary activities such as agriculture, stockbreeding, fishing and forest exploitation. In the cities, work is mainly focused on secondary and tertiary activities in industry, commerce and services.
- Explain why poverty and discrimination are social problems that are important for Geography.
Because these social problems are reflected in the HDI (Human Development Index)
- Mention some of the causes of migration.
Insufficient development, low access to productive resources, low urban development, the search for better standards of living.
- Why is Mexico considered a multicultural country? Explain your answer.
Because there is a great social mix of cultures and subcultures, due to its indigenous peoples.
- Mention two cultural manifestations in the people of your community.
Students' own answers.

Self-Evaluation

Read each key aspect to evaluate and tick (✓) the ones you have achieved.

Aspect to evaluate	I do it very well	I have a hard time doing it	I need help doing it.
I can explain the social and economic implications of the growth, composition and distribution of the population.			
I can recognize the social, cultural and economic interactions between the countryside and the city.			
I can analyze social problems of the world population and in Mexico.			
I can analyze the social, cultural, economic and political causes and consequences of migration.			

Peer-Evaluation

Team up with a classmate and evaluate what you have learned regarding the following. Discuss amongst yourselves the relationship between cultural diversity around the world and in Mexico and the importance of intercultural coexistence.

Aspect to evaluate	I do it very well	I do it with difficulty	I need help doing it.
I can appreciate the cultural diversity in the world and in Mexico, as well as the importance of the intercultural coexistence.			
I can differentiate the factors that impact on the changes in the cultural manifestations of the population in the world and in Mexico.			

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SESSION INFORMATION

Week: 24

Sessions: 93 - 96

EVALUATION AND SELF EVALUATION

CONTENT DELIVERY

Start: Students should answer page 87 prior to taking the unit assessment. Go through the answers; help them with techniques to study content they do not clearly remember.

Development: Students are to take the unit assessment. You can find it in the Teacher's Guide pages 153 and 154 along with the answer key on page 155.

Closing: Check their assessments, record the score and provide with feedback. You might want to use the Attendance and Evaluation formats that you can find the Teacher's Guide pages 166 and 167.

SKILLS DEVELOPMENT

Metacognitive skills: Self-monitoring, self-evaluating learning outcome.

EVALUATION OF CONTENT

Check the answer key to the unit assessment on page 155.

Student book U4

SESSION INFORMATION

Week: 25

Session: 97

Expected learning outcome: Identify topics in the unit students consider will be hard to understand in order to make a studies plan.

CONTENT DELIVERY

Start: Have students analyze and identify what they could do well in units 1 through 3; as well as what they should improve in unit 4. Ask them, for instance: What topics were easy? Did your previous study plan work? Didn't it work? Why? Did you really follow your study plan? Students should write down their reflections.

Development: Have students check the skills, learning outcomes and key concepts in unit 3. Ask them to identify the topics they consider the hardest ones. Then, they should plan how to study them and do better than the previous unit. If a strategy didn't work, then they should find another one. Help them with ideas. (Drawing mind maps, discussing with partners, making their own exams, making timelines, making associations, etc.)

Closing: Students should write down their study plan and have it checked.



Economic Spaces and Socioeconomic Inequality



Skills

- Reflecting on socioeconomic differences

Expected Learning

- Identify the differences in managing natural resources in agricultural, livestock, forestry and fishing spaces around the world and in Mexico.
- Explain the importance of mineral and energy resources of the world and in Mexico.
- Identify the types of industries and the importance of industrial spaces in the world's and Mexico's economies.
- Identify the importance of trade and transport networks in the context of globalized economy of the world and of Mexico.
- Identify the types of tourism and their economic importance in the world and in Mexico.
- Compare the socioeconomic differences in the world and in Mexico.

Project

Socioeconomic problems

Evaluation

SKILLS DEVELOPMENT

Metacognitive skills: Planning, organizing studies content.

EVALUATION OF CONTENT

Students should get their study plan checked by the teacher.

Distribution of Agricultural, Livestock, Forestry and Fishing Areas around the World

How much do you know?

Work in couples, read the text and answer the activity.

1. Write a brief explanation of what the text is about.
2. Identify and mark the productive activities mentioned in the text. Explain and define each one.

Globalization

Perhaps for Mr. Nguyen from Vietnam, the Spanish last-name López, might not ring a bell. But for entrepreneur Takeshi, from Japan, Nguyen is the worker who made a shirt with Hindu silk that he sold to Mr. López. The same happened with Kenyan farmer Achieng, who sold vegetables to Mr. Jürgens, a German agriculture entrepreneur. The vegetables will be sent to a London market, where Eileen, a Jamaican assistant to Mrs. Goldwyn, can buy and cook them. At the same time, Mr. López, wearing his new shirt, will meet the new manager of his firm in Colombia, who has just arrived in Madrid.

Carles Casals, 2001. *Globalization: notes of a process that is transforming our lives* (adaptation). Spain, Intermon, Ediciones Octaedro, p. 9-10.

Agriculture is an activity in which the soil is cultivated so that it can produce the food that we consume; this characteristic is what gives it a major importance (Map 4.1). It is practiced on almost the entire planet. The natural conditions in which it is practiced, the technology used, and the type, the quality and the quantity of production is what makes it different. For such reasons, in agricultural spaces, two kinds of agriculture are practiced: commercial and personal consumption. The first is done on fertile soil with irrigation and is characterized for being a receptor of financial capital and the use of machinery, fertilizers, improved seeds and all that is necessary to obtain large amounts of production destined for commercialization.

It is practiced in developed countries such as the United States, Canada, Australia and some European countries.

Basic agricultural products like corn, wheat and rice, have the largest productions around the world. (Chart 4.1).

Tropical products like coffee, sugar cane and tobacco are consumed around the entire planet, but their production has a very central distribution. In Mexico, tropical production is restricted to the coastal plain of the Gulf, specifically in Veracruz and other coastal regions in Guerrero and Oaxaca.

Livestock breeding is an activity dedicated to the breeding of animals of the same species with an economical purpose. The characteristics of livestock breeding are similar to agriculture. These two activities, frequently, share the same space which is why they are known as farming. As in agriculture, livestock breeding is practiced almost everywhere around the planet, there is diversity in how it is practiced and in the quality of the

Expected Learning

Identify the differences between managing natural resources in agricultural, livestock, forestry and fishing spaces around the world and in Mexico.

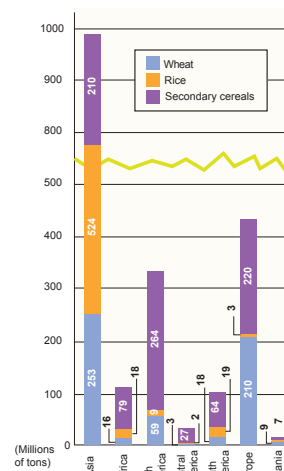


CHART 4.1 Production chart of some Cereals' production by continents.

SESSION INFORMATION

Week: 25

Session: 98

Pages 89 and 90 are studied in the same session

Expected learning outcome: Identify the differences between managing natural resources in agricultural, livestock, forestry and fishing spaces around the world and in Mexico.

CONTENT DELIVERY

Start: Organize students in pairs. Students should read and do the activities in the section *How much do you know?* Have them discuss and later, elicit answers in whole class.

Development: Students should read pages 89 and 90. Have students look up any term they do not know. Students should give definitions of the following terms:

Agriculture

Commercial agriculture

Personal agriculture

Tropical products (mention examples)

Livestock breeding

Intensive breeding

Extensive breeding

Main producers of bovine livestock

Closing: Check definitions according to the information on the page in whole class.

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Summarizing.

EVALUATION OF CONTENT

Students should get the definitions they got checked by the teacher.

SESSION INFORMATION

Week: 25

Session: 98

Pages 89 and 90 are studied in the same session

Expected learning outcome: Identify the differences between managing natural resources in agricultural, livestock, forestry and fishing spaces around the world and in Mexico.

CONTENT DELIVERY

Start: Organize students in pairs. Students should read and do the activities in the section *How much do you know?* on page 89. Have them discuss and later, elicit answers in whole class.

Development: Students should read pages 89 and 90. Have students look up any term they do not know. Students should give definitions of the following terms:

Agriculture

Commercial agriculture

Personal agriculture

Tropical products (mention examples)

Livestock breeding

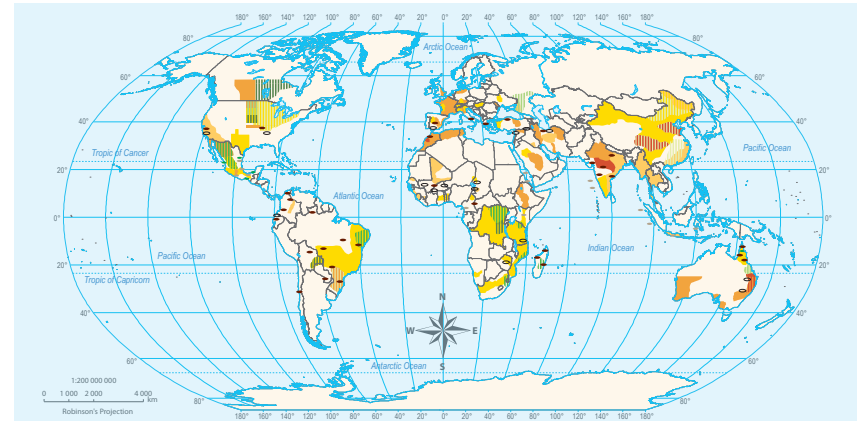
Intensive breeding

Extensive breeding

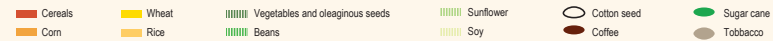
Main producers of bovine livestock

Closing: Check definitions according to the information on the page in whole class.

MAP 4.1 Global agricultural production.
SOURCE: *Geografía de México y el mundo*, Esfinge, 2012, p. 158.



MAIN AREAS OF AGRICULTURAL PRODUCTION



goods. The two types of livestock breeding are: commercial or intensive and personal consumption or extensive.

Commercial livestock breeding is highly technical. To increase the quality of the animals, technology is used to obtain greater milk production, as well as quality meat. Its production is destined for commerce. Some countries of large livestock breeding are the United States, Switzerland, the Netherlands, Denmark, the United Kingdom, Australia and Argentina (Map 4.2).

Both agriculture and livestock breeding for personal consumption, also called "backyard" farming, are destined to provide for consumption of the producers; the use of technology and machinery is non-existent or almost non-existent in this form of production.

In countries with less economic development, farmers of rural regions combine agriculture and livestock breeding for personal consumption.

The most important livestock by number of heads and its exploitation on the planet is the **bovine** livestock; most of it is dedicated to the production of milk and meat. The principal producers are the West plains of the United States, the Northeast of Europe, and the prairies of La Pampa. In Mexico, the states with larger production are Jalisco, Veracruz, Chiapas, Chihuahua and Sonora.

Porcine livestock is exploited when there are no possibilities of producing bovine livestock. In Mexico it is distributed throughout the country. The types of ovine and caprine livestock are associated with the

90

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Summarizing.

EVALUATION OF CONTENT

Students should get the definitions they got checked by the teacher.

mountain regions and poor soils and a low population density. Australia and New Zealand are the countries with the largest amount of this type of livestock and of wool production. In less developed and mountainous countries like Mexico, caprine livestock adapts to the dry conditions prevailing in the territory.

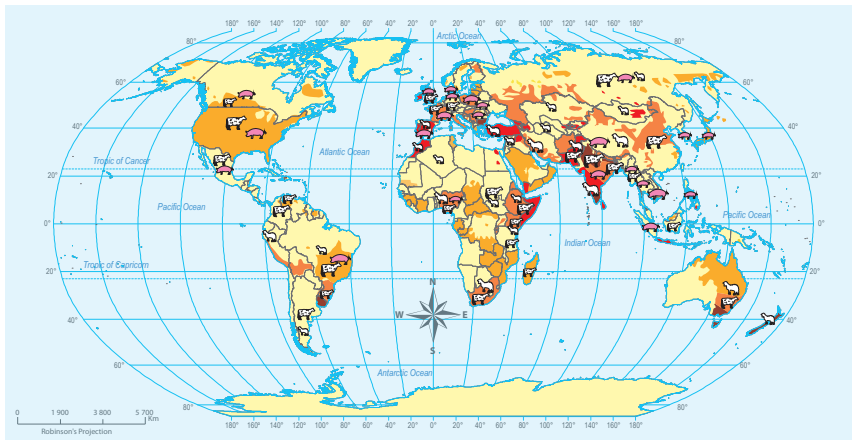
Poultry production is part of livestock breeding. Live poultry and hens are the most important in the production of food around the world; they are used for their meat and eggs. The countries with the largest production are the United States, China, Argentina and Russia. In Mexico this is more a family, rather than commercial activity, in which the farmer complements his production of food with live poultry.

Forestry refers to the exploitation and use of forests to obtain harvestable wood products and non-harvestable wood products. The most exploited forests in the world are the tropical forests and the temperate and cold

forests. The first are in the tropical and intertropical zones, in other words, the geographical equator and its surroundings. The countries with a larger production of hardwoods are Brazil, Colombia, The Democratic Republic of Congo and Indonesia.

Temperate and cold forests are represented essentially by coniferous pine trees and the oaks. The raw materials for the production of cellulose and diverse types of papers are obtained from these types of trees. These forests dominate the cold weather regions in North America, Europe and Asia. The countries producing and exporting paper are the ones that have vast extensions of coniferous forests; the most important ones are Canada, Norway, Sweden and Russia.

The distribution of forests determines the forestry activity. Although its distribution is predominately by altitude, you can find tropical forests concentrated in small areas of warm weather, such as the Southeast region



MAP 4.2 Livestock breeding in the world.
SOURCE: *Geografía de México y el mundo*, Esfinge, 2012, p. 159.

91

SESSION INFORMATION

Week: 25

Session: 99

Expected learning outcome: Identify the differences between managing natural resources in agricultural, livestock, forestry and fishing spaces around the world and in Mexico.

CONTENT DELIVERY

Start: Students should read page 91 and the top of page 92. Students should look up terms they do not know.

Development: Students will mind map the information using the following headings: Porcine livestock, poultry, forestry, hardwoods, and fishing.

Closing: Check students mind maps.

Project preparation: Organize seven teams. Students should do research about one of the dishes mentioned in the section *Apply your knowledge* on page 92. In the same box, you will find specific instructions on how students should do the project. Students will present their findings the following session. Explain what you will evaluate in their presentations.

SKILLS DEVELOPMENT

Critical thinking skills: Mind mapping.

EVALUATION OF CONTENT

Check students mind maps.

SESSION INFORMATION

Week: 25

Session: 100

Expected learning outcome: Identify the differences between managing natural resources in agricultural, livestock, forestry and fishing spaces around the world and in Mexico.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations about the activity described in the section *Apply your knowledge* in the middle of the page. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

Project preparation: Organize teams of four. Every team should take a piece of cardboard, markers, pictures of soil, marine flora and fauna, forests as well as stick glue, and scissors.

of hardwoods in Mexico. The species of coniferous, pines and oyamel firs are distributed on the slopes of mountains, by altitude.

Fishing is the extractive capture of fish and other aquatic species, like invertebrates, crustaceans, mollusks and mammals. In spite of being a traditional activity and its production of high nutritional quality, it only provides 1% of the total food of the world population, especially due to the high monetary and technological investment made in this activity.

Commercial fishing is very important worldwide. Its production is destined

for exportation or to national markets. The principal fishing regions in the world are located in the Northeast of North America, Northwest of Europe and coasts of China and Japan.

In Mexico, there are two principal fishing regions. The first region comprises the North Pacific, in the littorals of the Baja California peninsula and the coasts of Sonora and Sinaloa, in the Gulf of California. The second region is the Gulf of Mexico, formed by the littorals of Veracruz and Tabasco.

Apply your knowledge

Choose one of the following foods: vegetable soup, fish soup, bread, tortilla, chicken soup, schnitzel or rice pudding and do the following:

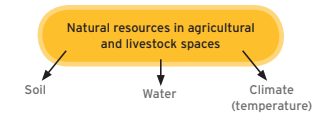
1. Make a list of the agricultural, livestock or fishing products used to prepare the food you chose.
2. Find out where the products in the food originated from, globally and nationally.
3. Draw a world map and a map of Mexico with the distribution of the products in the food that you chose. Invent your own symbols and try to use large maps. You will need them later on.
4. Explain your world map to two classmates.



FIG. 4.1 El Bajío, near San Miguel de Allende, Guanajuato.

Relationship between the Natural Resources and the Agricultural, Livestock, Forestry and Fishing Areas

The agricultural, livestock, forestry and fishing spaces of the planet, and in our country in particular, maintain a very close relationship to the exploitation of the resources provided by nature.



Soil It is the superficial layer of Earth's crust, an unconsolidated material formed by minerals, organic matter, water and gases. It is characterized for having limits or differential layers, which surge from a transformation of the rock combined with weather, vegetation, organisms such as bacteria and the topography.

The nutrients in it, the thickness, salinity, etc., are characteristics that give soil its value as a natural resource, as well as being adequate or not for agricultural and livestock activities. An example of fertile soil is the lowlands of El Bajío region, located in the states of Jalisco, Michoacán, Querétaro and Guanajuato. (Fig. 4.1).

Kells

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SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

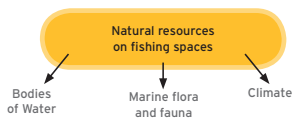
Follow the projects rubrics, Teacher's Guide page 163.

Whether it is by natural or through irrigation systems, **water** is essential to the growth of crops. In agriculture and commercial livestock breeding, water is provided by irrigation systems, for which **dams** are built with the purpose of controlling the direction and the quantity of water destined to agricultural and fodder crops.

The climate, **temperature** in particular, has a big influence on the kind of crops that are grown. There are certain crops which reach their maximum development only in warm and rainy weathers, such as coffee, sugar cane, tobacco, cocoa trees.

The regions with semidry climates are excellent for the growth of fodder grass. Fishing is directly related to bodies of water, especially the salty ones, because practically all life forms have disappeared from fresh-water bodies as a consequence of pollution. The diversity and quantity of species of marine flora and fauna develops according to the characteristics of the temperature, density, depth and salinity of the oceanic waters.

Species of marine flora and fauna are quite diverse. The seas concentrate the largest biodiversity on the planet, even though their commercial and acceptance value depends to a great extent on the eating habits, income and advertising of the product.



Species from cold waters are different from species found in warm waters of the seas and the oceans. In each fishing space, the captured species are different; diversity is typical of this activity.

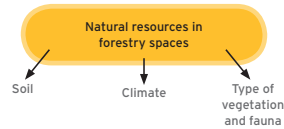
The presence of vegetation in a geographical space allows the development of forestry activity, the natural resources exploited are: the soil, the weather and the type of vegetation.

The soil supports the presence and growth of vegetation, even though the requirements for this primary vegetation are not the same for the crops introduced.

Forest soil possesses the fundamental properties for the growth of vegetation, whether they are **xerophytes**, grasses, herbaceous or forests. Each one of these regions has an endemic fauna.

Climate is one of the factors that particularly influences the type of vegetation, and topography influences the type of climate and soil as well.

In Mexico, the characteristics of the natural elements of the geographical space are so diverse, that there is a wide variety of soils, climates and vegetation; that means that there is a wide variety of natural resources that are exploited for agriculture, livestock breeding, fishing and forestry exploitation.



GLOSSARY

Dam. Barrier made of stone, concrete or rockfill, usually built in a gorge or canyon over a river or a creek, with the purpose of retaining water in the riverbed for later use.

Xerophyte. Plants adapted to survive in a dry environment; they have thorns instead of leaves in order to diminish perspiration.

SESSION INFORMATION

Week: 26

Session: 101

Expected learning outcome: Identify the differences between managing natural resources in agricultural, livestock, forestry and fishing spaces around the world and in Mexico.

CONTENT DELIVERY

Start: Ask students how they think natural resources are connected to agriculture, livestock, forestry and fishing. Elicit examples. Students should read pages 92 and 93. In case they do not understand a term, they should look it up.

Development: Students should make an informative poster on how natural resources are linked to agriculture, livestock breeding and fishing using the materials they were told to take to class.

Closing: Students should display their posters around the classroom.

Homework: Individually, students should do the activities described in the section *Apply your knowledge* on page 93.

Apply your knowledge

Read the instructions and complete the next activity.

1. Identify the natural resources that were used to create the products in your choices in the previous activity.
2. With the map of Mexico you made in the previous activity, locate the agricultural, livestock or fishing products, and mark the natural resources you used to create the food you chose.
3. Write a brief text where you explain the importance of natural resources for production.
4. Share your work with two of your classmates.

Kells

SKILLS DEVELOPMENT

Critical thinking skills: Predicting.

Visual/Spatial skills: Graphing.

Logical/Mathematical skills: Discovering relations.

EVALUATION OF CONTENT

Students should actively participate in the poster making process. They should get it checked by the teacher.

SESSION INFORMATION

Week: 26

Session: 102

Expected learning outcome: Identify the differences between managing natural resources in agricultural, livestock, forestry and fishing spaces around the world and in Mexico.

CONTENT DELIVERY

Start: Tell students: *Imagine you own your piece of land devoted to agriculture, livestock breeding or forestry. Would you use hard chemicals to enrich the crops? To make trees grow up faster? Or for animals to grow faster? Because more production means more money. Why would you take that decision? Why not?* Lead a short discussion.

Development: Students should read the text about management systems of primary economic activities. Students should look up for terms they do not know. Organize round tables to discuss how they would manage agriculture, livestock breeding, forestry and fishing in Mexico to be productive but with sustainable development. Each person in the round table will play a different role: The president, the landowner, the secretary of economy, the secretary of social development, and a foreigner investor. Remind students they should respect each other's turn to talk and each other's opinions.

Closing: Contrast what each round table agreed and in whole class, decide which the best ideas are to responsibly manage primary economic activities.

Homework: Students should take a device with Internet access the following session.

Management Systems of Natural Resources in Agricultural, Livestock, Forestry and Fishing Areas in the World and in Mexico

In all geographical spaces, the use of natural resources depends primarily on the economic capacity we have and the policies we enforce.

In some agricultural and livestock breeding spaces, the enormous progress in production is partially due to the breakthroughs that industrialization has brought to rural work. Even though the use of technology has generated overexploitation and overgrazing of the soil, which have deteriorated it through erosion, infertility and in general, **desertification**, the lack of technology also has an effect.

In the most developed regions, there is a clear relationship between the harvested area and the number of tractors and other types of used machinery in agricultural and livestock breeding spaces. The highest levels are registered in Europe and North America, where there are clear policies supporting this sector.

In less developed regions, like Latin America, Africa and large areas of Asia, machinery is used less in agricultural and livestock areas for personal consumption.

Tropical forests are the most disrupted, particularly because of the broadening of the agricultural and livestock boundaries, just as for

the extraction of the precious species. In the Amazonia, for example, massive wood cutting is done with the intention of using just a handful of commercially important species. In our country, this situation is the same in the Lacandon jungle and other tropical forests.

Oceans, seas, rivers, lakes, but mainly the salty bodies of water, receive large amounts of pollutants that harm the quality of the water and diminish or annihilate existing flora and fauna.

More developed countries use sophisticated boats for fishing the largest quantity. These capture methods create an unnecessary exploitation of oceanic flora and fauna. Countries like Japan, China, the United Kingdom and the United States commonly use these methods; in the last decade there have been a series of fishing regulations that have led to a decrease in the captures permitted in these countries.

Mexico has been suffering a fishing crisis for more than two decades, the principal problems are the inappropriate use of fishing resources, overexploitation, lack of national technology and a misguided legislation towards the rational use of resources.

GLOSSARY

Desertification. N. the transformation of arable or habitable land to desert, from change in climate or destructive land use.

How much did I learn?

With the next activity you will distinguish the differences in managing natural resources in agricultural, livestock and fishing spaces.

1. Identify the places or states in our country where you get agricultural, livestock or fishing products, as well as the natural resources used for their production
 - a) Identify the types of agriculture, livestock breeding and fishing that are performed in order to obtain the products, methods of harvesting, capture or domestication.
 - b) Identify the appropriate or inappropriate management of natural resources that are used for agricultural, livestock or fishing production.
2. Write a text about the use of natural resources managed in the regions that you researched. Share your text with two of your classmates.

Kells

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SKILLS DEVELOPMENT

Critical thinking skills: Imagining, problem solving.

Interpersonal skills: Discussing.

EVALUATION OF CONTENT

Check that everyone actively participates in the round tables.

Distribution of the World's Main Mineral and Energy Deposits

How much do you know?

Work in groups of four and discuss the answers to the following questions.

1. Are minerals natural resources? Explain which kind. Are all minerals rocks? Which ones are not?
2. What is the layer of Earth that contains minerals? Can they be found anywhere else?
3. Explain in which productive activities minerals are used.
4. Is mining activity a synonym of industrial activity?

Write a summary with your conclusions.

There are several types of minerals: metallic, non-metallic and hydrocarbons, which were formed millions of years ago and have remained in Earth's crust.

The distribution of mineral deposits is scattered across the entire crust; the great mountain ranges hold deposits that contain copper, aluminum, lead, sulfur, sodium sulfate, sand and other minerals, while deposits of hydrocarbons, oil and gas, are located in depressions or flat regions that allowed sedimentary processes mainly of marine origin.

The countries with a larger metallic and non metallic production are: the United States, Canada, Russia, China, Chile, Zambia, Australia and South Africa, amongst the most important ones.

Radioactive minerals like uranium, cesium and plutonium, are used to generate nuclear energy; North Korea, Niger, South Africa and Australia, are the largest producers of this kind of energy. Today, resulting from accidents

in Chernobyl (1986) and in Japan's nuclear central in Fukushima (2011), its use as an energetic alternative is still being questioned.

In Mexico, deposits of metallic and non-metallic minerals are linked to the Sierra Madre Occidental and the Sierra Madre del Sur, hydrocarbons are distributed along the coastal plains of the Gulf, the southeast and a part of the Yucatan platform and the north of Chiapas.

Our country has the second place worldwide in production of silver, bismuth, cadmium and fluorite; Mexico stands out in the production of arsenic, lead, cadmium, antimony and zinc, among others. Historically, the mining production in Mexico has been mainly of precious minerals, which went down remarkably in 2003, particularly because of the low prices that obstructed the investments in this sector.

→ Expected Learning

Explain the importance of mineral and energy resources in the world and in Mexico.

Curious Fact

In mining, 90% of the workers are men and 10% are women.

Apply your knowledge

Copy the next chart in your notebook and find out where these minerals are found. Use books or the Internet.

Mineral	Producer country	Production in states of Mexico	Mineral	Producer country	Production in states of Mexico
Silver	Mexico, China, Peru, Australia, Russia	Zacatecas, Chihuahua, Durango... etc.	Lead	China, Australia, United States... etc.	Chihuahua, Zacatecas, Durango
Gold	Ghana, Uzbekistan, Indonesia... etc.	Sonora, Zacatecas, Chihuahua... etc.	Zinc	China, Peru, Australia... etc.	Chihuahua, Zacatecas, San Luis... etc.
Iron	China, Australia, Brazil... etc.	Jalisco, Colima, Michoacán	Manganese	China, South Africa, Australia... etc.	Baja California Sur, Guerrero, Zacatecas

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SESSION INFORMATION

Week: 26

Session: 103

Expected learning outcome: Explain the importance of mineral and energy resources in the world and in Mexico.

CONTENT DELIVERY

Start: Tell students: *Today, we will talk about minerals. Can you tell me some?* Have students mention five to seven examples. Divide students in teams, giving each team the name of one of the minerals they mentioned. Students should predict the answers to the questions in the section *How much do you know?* Elicit some answers.

Development: Students then should read the text and contrast the information with the answers they predicted. Help them clarify concepts, and elicit answers.

Closing: Students should identify the reasons why mining is an important activity in Mexico. Later, have them copy the chart in the section *Apply your knowledge* and using the Internet, they should complete the chart.

SKILLS DEVELOPMENT

Critical thinking skills: Predicting, doing research, discriminating information, comparing and contrasting.

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Check students' answers to the activities.

SESSION INFORMATION

Week: 26

Session: 104

Expected learning outcome: Explain the importance of mineral and energy resources in the world and in Mexico.

CONTENT DELIVERY

Start: Show students some objects like a bar of steel, something made of plastic, makeup, something with copper; ask students what material they are made of and where those materials come from. Are they minerals? Alloys? Polymers? If they don't know what an alloy or polymer is, organize a competition to find the definition as quickly as possible in a dictionary.

Development: Ask students to read the section *Extraction and Transformation of Mineral and Energy Resources around the World and in Mexico*. Show students again the same objects you used at the beginning of the class and have them correct or confirm their hypotheses. Organize teams of three or four students. Each team will write a questionnaire about the section information. Elicit some questions.

Closing: Teams should exchange questionnaires and answer each other's questions.

Project preparation: Organize five to seven teams, according to your group size. Each team will choose a mineral or energy source extracted in Mexico. Then, they should do the research explained in the section *How much did I learn?* On page 97. They should present their research the following session.



FIG. 4.2 Oil well.

Oil global production	
Regions or countries	Oil global production (millions of daily barrels)
Africa	10.6
Asia and Australia	10.9
Europe	9.7
Latin America and the Caribbean	14.5
North America	14.3
Middle East	29.5
Russia	10.5
Total	100%

Source: Energetic statistic from the OLADE (Latin American Energy Organization). Data from 2002.

TABLE 4.1

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Extraction and Transformation of Mineral and Energy Resources around the World and in Mexico

Mining is the economic activity through which minerals in Earth's crust are extracted. It is a source of employment and income, and it promotes regional development; but it can also create social, labor and environmental problems due to the lack of policies regulating working conditions and extraction in a planned way, to avoid environmental deterioration. Breakthroughs in technology and the increase in the world population and consumption have motivated the rise of the raw production of minerals, especially hydrocarbons, since they are the main source of fuels. The extraction of minerals, oil in particular, is becoming more and more sophisticated.

No mineral is used in the state it is extracted, in all cases, they are all subject to some kind of process to be transformed into the mineral raw materials that industry needs. When they are extracted from the crust, they obtain the rocks as a compound of minerals, the first step is to separate them in order to obtain the mineral you are interested in.

Iron is subjected to an alloy process with coal, with the purpose of obtaining steel, which is fundamental for industrial production. The main countries producing iron are the same countries leading

The Importance of Mineral and Energy Resources for Mexico and other Countries' Economy

Developed countries control, to a great extent, the production and transformation of minerals, not only within their territory, but on the entire planet as well. Since they are the most industrialized, they are the ones consuming the largest part of the extracted minerals.

Oil has become the "black gold" of global economy, because without this fuel, production would be impossible. There are large mining and oiling companies with multinational

the production of steel: Russia, China, Australia, Canada, the United States, Brazil and India, among others. Copper is next in importance. Chile is the largest copper producer; even though a considerable amount of this mineral is transformed in their territory, they also export it, mainly to the United States and Europe.

Oil is extracted from wells; in order to reach it, the underground needs to be drilled with a machine that has a diamond-tipped spinning rod. As it goes deeper in the ground, a pipeline is installed to pump the oil up to the surface (Fig. 4.2).

Oil has a large range of byproducts, it is transformed in industries called oil refineries. Besides fuels like gasoline, gasoil and diesel, we can also obtain other polymers to manufacture plastics, lubricants, cosmetics, polyester and asphalts, among many others. Thousands of oil barrels are extracted every day throughout the world; in the countries of the Middle East and North Africa, oil extraction has a great influence in the political relationships of power. This mineral has the highest market value, because of the large variety of byproducts it has (Table 4.1).

capitals, which control not only mineral production, but also the political and economic life of countries that have oil as a natural resource.

Minerals are non-renewable resources, once they are extracted, they are finite and they take several millennia to replenish again.

At present, the development and use of alternatives to avoid the use of hydrocarbons is being planned globally. One potential solution to the problems of environmental deterioration lies in the

SKILLS DEVELOPMENT

Critical thinking skills: Risking and speculating, confirming hypothesis, formulating questions.

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Students should get their questionnaires checked by the teacher.

use of clean energy, which will guarantee the safety of its production in the long run, and at the same time, stop urban development by offering better life conditions to rural areas, particularly in less developed countries (Fig. 4.3).

In Mexico, the most important mineral due to its extraction and its byproducts is oil. Mexico possesses several deposits and ranks between the seventh and eighth place as producer worldwide. In Latin America, Mexico ranks second place, just after Venezuela. However, the massive sell of non-processed crude oil follow the scheme characterizing underdeveloped countries: exporting raw materials and importing finished goods.

Types of Industries in the World



How much did I learn?

Read the next instructions and write the results of your investigation in your notebook.

1. Choose a mineral that is extracted in the country and locate the area of its distribution and exploitation on a map of Mexico.
2. Research what the final products obtained from the transformation of this mineral are and explain the economic importance it has for the country and for economic production in general.

Share your work with your classmates and teacher.



FIG. 4.3 La Ventosa, Oaxaca. Generation of electric energy project in Mexico.

Expected Learning

Identify the types of industries and the importance of industrial spaces in the world economy and in Mexico.

How much do you know?

Look at map 4.3 and complete the next activity.

1. What type of industry does the map make reference to?
2. What does industrial activity mean? What types of industries do you know?
3. Are there any types of industries in your neighborhood or community? What do these industries produce?

MAP 4.3 Automotive industry in Mexico
SOURCE: Geografía de México y el mundo, Esfinge, 2012, pp. 193-194.

SESSION INFORMATION

Week: 27

Session: 105

Expected learning outcome: Identify the types of industries and the importance of industrial spaces in the world economy and in Mexico.

CONTENT DELIVERY

Start: Ask students to tell some mineral and energy resources that were mentioned the previous class and whether the resource is raw material, an alloy or a polymer.

Development: Students should read the section *The Importance of Mineral and Energy Resources for Mexico and other Countries' Economy*. Ask the following comprehension-check questions:

Who has to great extent the control, production and transformation of minerals?

What is black gold? Why is it called like that?

What do large mining and oiling companies control?

Are minerals renewable?

What is being planned globally?

Which is the most important mineral in Mexico?

Which is Mexico's rank in oil extraction?

What's the scheme characterizing developing countries regarding oil extraction?

Closing: Students should give their presentations. Be ready to have a presentation ready, just in case nobody is ready.

SKILLS DEVELOPMENT

Interpersonal skills: Working as a team member.

Reading skills: Scanning, reading for detail.

Critical thinking skills: Doing research.

EVALUATION OF CONTENT

Check students' answers to the questions and their project results.

SESSION INFORMATION

Week: 27

Session: 106

Expected learning outcome: Identify the types of industries and the importance of industrial spaces in the world economy and in Mexico.

CONTENT DELIVERY

Start: Organize pairs. Students should start answering the questions in the section *How much do you know?* On page 97, by looking at the map right next to it. Elicit answers.

Development: Have students read page 98. If there is a term they do not know, they should look it up. Students should synthesize the information in a synoptic table.

Closing: Ask comprehension-check questions about the text.

Homework: Organize teams of four people. Teams should do the research explained in the section *Apply your knowledge* on top of page 99.



FIG. 4.4 Images from steel industry.

The main purpose of industries is the mass producing of products, reducing costs and increasing the profits. Depending on the type of production and the final purpose of the goods, we can find two important types of industry: basic or heavy, and transformation or light industries (Table 4.2). The *basic industry* manufactures products for the industry itself. This industry generates the highest profits and is almost exclusive to developed countries.

Steel industry produces steel and is fundamental for the development of other types of industries. The production of steel divides countries into industrialized or unindustrialized. The process consists of the fusion of iron and coal in large furnaces, so it can later be formed in ingots or be laminated (Fig. 4.4).

Petrochemical industry uses oil as a raw material, and gas to obtain chemical products, which will be used later on to manufacture a wide array of other products, for example, plastics and fuels.

Metallurgical industry refers to the transformation of other metals that are not iron, such as copper, aluminum and tin, among others.

Electric industry generates energy by transforming other types of energy, like mechanic, thermal or luminous energy (Fig. 4.5).

Within the basic industry we also find the construction of big specialized machinery, like ships, planes, railroads, artificial satellites, space crafts, etc. The



FIG. 4.5 Simon Bolivar hydroelectric central in Caroni River, Guyana.

Types of industry

Types of industry	
Basic industry	Transformation industry
Steel industry	Food industry
Petrochemical industry	Textile industry
Metallurgical industry	In-bond assembly, artisan shoes industry

TABLE 4.2

transformation or light industry is dedicated to producing goods for direct consumption by the population. Products come out of factories and are distributed to the immediate consumption centers. The investment of financial capital and technology in this type of industry is less than in the basic industry, just as the use of energy and the workforce.

Food industry is the transformation of agricultural, livestock and fishing products is a common process nowadays. Almost all these products are industrialized before they reach our tables, being more common in urban than in rural regions. Its development is so broad that it has to be subdivided into soft drinks industry, dairy industry, canned food industry, etc. (Fig. 4.6).

Textile industry is the oldest of them all. Generally, it is considered a part of it the production of fabric, clothes and shoes; this is because this industry manufactures goods related to the attire of human beings. The textile industry generates a vast quantity of jobs, directly and indirectly, and is very important to the world's economy.

In-bond assembly industry gained importance inside the Mexican economy during the decade of 1960. It is composed basically of transnational assembling plants, that is, enterprises with foreign capital that began to appear in the north border of our country during those years.



FIG. 4.6 Food industry

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SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Synthesizing.

Visual/Spatial skills: Charting.

EVALUATION OF CONTENT

Check students' tables.

Apply your knowledge

Work in teams of four and select one type of industry, basic, transformation or in-bond. Do some research about it based on the following points:

1. Mention the industry and type of production. Explain if it is basic or transformation and the characteristics that define its classification.
2. Make an image album showing the characteristics of the industry you chose and present it to the rest of your classmates along with your conclusions.

Distribution of the Main Industrial Spaces around the World and in Mexico

Today, industry is located in large regions such as the United States, the European Union and the East and South East of Asia, Canada and Australia (Table 4.3).

American industry, being one of the strongest on the planet, expands across the totality of its territory; having a notable concentration in the upper Midwest and the Northeast, in the region of the Great Lakes.

The United States is characterized by its large industrial diversity, and is one of the countries with a huge number of exports in financial capital and technology for the establishment of industries in other territories.

Europe is the oldest industrial center in the world; the highest production volumes are concentrated in the countries of Eastern Europe. The countries that colonized many others throughout the world are located here, and by doing so they manage to possess the natural resources of almost the entire Earth's surface (Table 4.4).

Japan's geographical position makes it the political laboratory of the United States, which is why both countries are now political and economic allies. The same happens with Italy and Switzerland, where technology makes up for the lack of natural resources.

By the beginning of the twenty first century, China became the country with the largest industrial development in the world. Its abounding workforce, mineral resources and natural ports for commerce have been a determinant factor for the entrance of financial capital from big global corporations seeking development of the industry. China is a world leader now in the production of hundreds of industrial products, many of them of everyday use, products such as phones, televisions, computers, fabrics, medical products and electronic components (Fig. 4.7).

In Mexico, the industry has, historically, concentrated in the center of the country; Mexico City makes up for 34% of the **Gross Domestic Product (GDP)**, whereas the states of Jalisco and Nuevo Leon contribute with nearly 16%. The states that now join with the largest industrial income in our country are Baja California, Chihuahua and Coahuila at the border, and Puebla, Veracruz and the Estado de Mexico. Look at the map of industrial distribution in Mexico (Map 4.4).

GLOSSARY

Gross Domestic Product (GDP).

Production of final goods and services of a country during a certain period of time.

TABLE 4.3 Industrial spaces in the world.

District	Types of industry
East New England	Machinery and tools, electric equipment and textile machinery.
New York	Predominant commercial activity and transformation industry.
Pennsylvania	Steel industry over the Atlantic, train engines, airplanes, oil refineries, chemical industries.
Pittsburgh-Cleveland	The most important steel industry center, automotive and chemical industries.
Chicago-Milwaukee	Steel and metallurgic industry.

Country	Most important types of industries
United Kingdom	Textile, chemical, steel, paper, electronic and metallurgic equipment, metal-mechanic.
France	Steel, electro-metallurgic, hydroelectric, mechanical, chemical.
Germany	Metallurgic, mechanical, steel, electronic, automotive.
Belgium and Luzembourg	Steel, telephone and electric devices, weapons and precision devices, chemical.
Italy	Steel, hydroelectric, aeronautical, agricultural machinery, chemical.
Switzerland	Watchmaking, precision devices and assembled products that use raw materials.

TABLE 4.4

SESSION INFORMATION

Week: 27

Session: 107

Expected learning outcome: Identify the types of industries and the importance of industrial spaces in the world economy and in Mexico.

CONTENT DELIVERY

Start: Students should present their research (there are two sessions to complete this topic).

Development: Students will read the section *Distribution of Main Industrial Spaces around the World and in Mexico*, which starts on page 99 and ends on page 100. Meantime, write on post-it notes names of different countries around the world, mentioned in the chart *Industrial Spaces in the World* on page 99 (one per note). Each student should have one. Once they finish reading, tell them that they are representatives of different countries at the "World Industry Fair" and that they should convince other four countries representatives to buy the products they produce (Mentioned in the chart). Students should keep a sales register with the name and signature of the representative who buys their products. Monitor their work.

Closing: Students should be able to identify the main industrial spaces around the world and the products they produce.

99

SKILLS DEVELOPMENT

Interpersonal skills: Teaching others, selling.

Bodily/Kinesthetic skills: Acting.

EVALUATION OF CONTENT

Elicit names of countries and the products they make.

SESSION INFORMATION

Week: 27

Session: 108

Expected learning outcome: Identify the types of industries and the importance of industrial spaces in the world economy and in Mexico.

CONTENT DELIVERY

Start: Students should briefly present their research.

Development: Students will read the section *Distribution of Main Industrial Spaces around the World and in Mexico*, which starts on page 99 and ends on page 100. Meantime, write on post-it notes names of different countries around the world, mentioned in the chart *Industrial Spaces in the World* on page 99 (one per note). Each student should have one. Once they finish reading, tell them that they are representatives of different countries at the “World Industry Fair” and that they should convince other four countries representatives to buy the products they produce (Mentioned in the chart). Students should keep a sales register with the name and signature of the representative who buys their products. Monitor their work.

Closing: Students should be able to identify the main industrial spaces around the world and the products they produce.



FIG. 4.7 Chinese assembly plants massively produce everyday products of low quality, which spread across the planet.

MAP 4.4 Industrial States in Mexico
SOURCE: Esfige 2005. Atlas universal y de México.



Industrial parks are areas where industries are concentrated; they are located on the northern border, in Jalisco, Aguascalientes, San Luis Potosí, Guanajuato, Queretaro, Tlaxcala and Veracruz.

Industries are formed by a small number of large national and international enterprises, and a large number of micro, small and medium enterprises, which contribute to half of the manufacturing production in the country.

The big national and transnational companies contribute greatly to

petrochemical production, which is why Mexico ranks among the top ten most important countries exporting these products.

Generalized industry comprises transformation, fabric production and food industries. The basic or capital goods industry is hindered by the high cost of technologies, the most important are: petrochemical, metal-mechanic, metallurgic and steel industries.

100

SKILLS DEVELOPMENT

Interpersonal skills: Teaching others, selling.

Bodily/Kinesthetic skills: Acting.

EVALUATION OF CONTENT

Elicit names of countries and the products they make.

The Importance of Industry in Mexico's Economy and in other Countries

Industrial activity has been the engine of global economy since the nineteenth century. It creates wealth and job opportunities along with services, it is the one that contributes the most to the GDP. Even though services and commerce are currently the activities with the largest production, they would not exist without industrial activity.

Manufactured goods acquire a higher economic value when they leave the factory; it is estimated that farmers and livestock breeders increase their value to the double, whereas minerals do it five times more.

There is, however, a series of implications to industrial development. On the one hand, the progress of industrial centers gives rise to infrastructure in communication and services; it originates commercial exchange and the making of profits. On the other hand, as industrial technification grows,

a rising supply of technical and financial services is required as well. Although these are part of another branch of production, they are closely related to industry. In our country, the main exportation product used to be oil, now manufactured goods are predominant. Commerce with countries of the European Union represents 14% of all exports, directed mainly to Spain, France and Germany.

Industry creates jobs opportunities, along with commerce and services; it comprises a considerable amount of the economically active population.

The manufacturing sector has contributed importantly to the creation of jobs in Mexico, since it makes up for about 3.5 million jobs, out of which close to 75% is distributed among the industries of processed foods, engineering, textile and generation of chemical products.

How much did I learn?

In the following activity you will identify the types of industries and the importance of industrial spaces for economy.

Work in teams of four and do the next activity using the map 4.4.

1. Identify the type of industry that exist in your state, if there is no industry then choose the industry you prefer.
2. Explain the economic and social importance this type of industry originates, and other aspects you consider relevant (number of jobs it creates, amount of production, use of natural resources, ways of communication and transport it originates, etc.).
3. Illustrate your work with images or pictures and present it to the rest of your classmates.

Trade and Transport Networks around the World and in Mexico

How much do you know?

Work in teams of three or four and complete the next activity.

1. Make a list of the products that you have used throughout the day.
2. Make a chart with five products chosen from the ones that you named. Use the following headline. Imagine where each product comes from, what are the processes they had to go through to get to your hands, and the communications and transportation used.
3. Explain the importance of trade, communication and transportation so that you get the products that will satisfy your every-day needs.

Name of the product	Origin	Previous processes before getting to your hands	Ways of communication and transportation used

→ Expected Learning

Identify the importance of trade and transport networks within the context of the globalized economy of the world and of Mexico.

SESSION INFORMATION

Week: 28

Session: 109

Expected learning outcome: Identify the types of industries and the importance of industrial spaces in the world economy and in Mexico.

CONTENT DELIVERY

Start: Ask students to look at the map on page 100 and identify the types of industry in Mexico.

Development: Students should read the section *The Importance of Industry in Mexico's Economy and in other Countries*. Organize teams of four students and have teams work in the activity explained in the section *How much did I learn?*

Closing: Elicit answers.

101

SKILLS DEVELOPMENT

Visual/Spatial skills: Locating.

Interpersonal skills: Working as a team member.

Logical/Mathematical skills: Discovering relations.

EVALUATION OF CONTENT

Students should get the activity in the section *How much do you know?* checked by the teacher.

SESSION INFORMATION

Week: 28

Session: 110

Expected learning outcome: Identify the importance of trade and transportation networks within the context of a globalized economy.

CONTENT DELIVERY

Start: Organize teams of three or four students. Teams should do the activity described in the section *How much do you know?* At the bottom of page 101. Elicit answers.

Development: Students should read pages 102 and 103. Prepare cards that in one side have the following questions, and in the other different number of points: 100, 200, 500 and 1000. What is commerce? What is internal trade? What limits internal trade? Who or what limits the maximum price to the consumer? What is foreign trade? Which is the policy of globalization? Who has the largest share of exchange? What's the other name of transnational companies? Which is Mexico's main trade activity? What do Mexican exports mainly consist of? Which are the most popular means of transportation for products? Which are some important sea routes? Which places in Mexico still lack communication routes? Organize two teams. The team that can answer each question correctly will win the number of points indicated in the back of the card.

Closing: The team with most points is the winner.

GLOSSARY

Transnational companies.

Enterprises that settle outside their countries in order to conduct production and sales of their products.

Imports. Transported goods from another country for internal consumption.

Exports. Sent goods to another part of the world for consumption outside the country of origin.

To Learn More

A commercial block is an international organization that comprises a group of countries with the objective of gaining mutual benefits from international trade.

MAP 4.5 Transport and networks.
SOURCE: *Geografía para bachillerato*.
Pp. 317. Fernández Editores.

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Commerce or trade, an activity that can be defined as the exchange of merchandises between producers, distributors and consumers. Products are made in agriculture, livestock breeding and industry, including raw materials. The largest part of the profit lies in the exchange of products, which, in order to complete a full cycle, need to reach the consumer. The activity dedicated to its distribution is called commerce.

The predominant economic system is the one that allows free production and exchange of satisfactory products, as well as the generation of primary products so that they can later on be transformed and distributed.

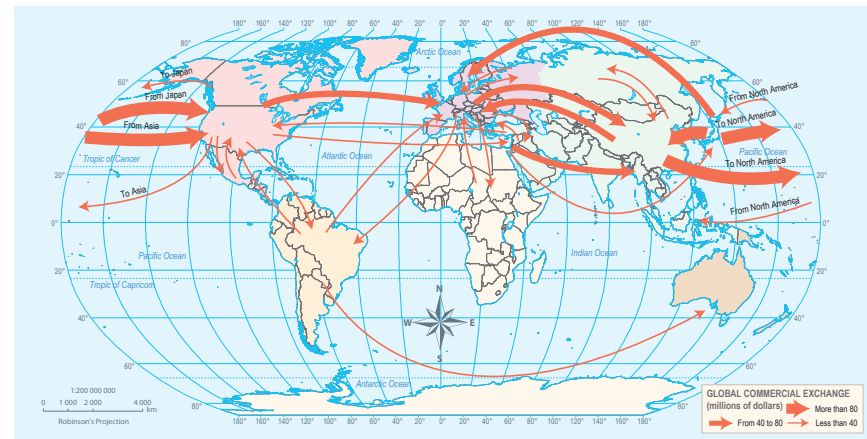
Internal trade is conducted within the boundaries of a country; its limitations are reduced to regulations imposed by governing institutions controlling this activity, especially when it concerns the lawfulness of the circulating products and the maximum price to the consumer. Foreign trade is traditionally regulated by agreements between the countries where

it is conducted and nowadays it has a globalizing objective. The policy of globalization has as one of its main objectives to distribute products around the entire planet.

Developed or industrialized countries are the ones controlling international trade, and they also have the biggest share of exchange (Map 4.5).

However, it is important to make clear that **transnational companies** are the ones producing and distributing merchandise; they are better known as multinational corporations.

Mexico conducts foreign trade activities, especially with the United States, though **imports** are larger than **exports**. The exports consist, mainly, of byproducts of the exploitation of mineral resources. Transport and communication are the means through which development and mobility of merchandise is achieved. The actual volume of the products we consume



SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Students should actively participate in the game.

is so high that, in many cases, they travel long distances using technologies in communication and transportation.

Transportation and ways of communication reflect the internal integration of a country and its links to the outside world. From a geographical point of view, communications imply dominion of space. The connections between spaces allow the mobility of merchandise even between very distant places or places across the oceans. The most popular means of transportation for trading are boats, railroads and trucks. The great transporters of cargo are railroads, intercontinental ships and powered trucks.

Sea transportation is the most important for the mobility of merchandise. The number of ships grows larger every day, because

finished goods can be transported, as well as raw materials. Some important sea routes are the ones communicating European countries with those of North America.

In Mexico, the oldest means of transportation is by land. The tracing of land lines was radial, having Mexico City in the center. Later on, transversal lines started to appear until a complex network of communication was formed (Map 4.6). However, there are still spaces with pending communication in the Yucatán peninsula and the northern area of the Mexican territory.

This system allows the mobility of bulk material, especially agricultural products (corn, sorghum) and mineral products (iron, silver).



MAP 4.6 Highways, railways and ports in Mexico.
SOURCE: Atlas universal y de México, Esfinge, 2010, pp. 85-86.

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SESSION INFORMATION

Week: 28

Session: 111

Expected learning outcome: Identify the importance of trade and transportation networks within the context of a globalized economy.

CONTENT DELIVERY

Start: Organize teams of three or four students. Teams should do the activity described in the section *How much do you know?* At the bottom of page 101. Elicit answers.

Development: Students should read pages 102 and 103. Prepare cards that in one side have the following questions, and in the other different number of points: 100, 200, 500 and 1000. What is commerce? What is internal trade? What limits internal trade? Who or what limits the maximum price to the consumer? What is foreign trade? Which is the policy of globalization? Who has the largest share of exchange? What's the other name of transnational companies? Which is Mexico's main trade activity? What do Mexican exports mainly consist of? Which are the most popular means of transportation for products? Which are some important sea routes? Which places in Mexico still lack communication routes? Organize two teams. The team that can answer each question correctly will win the number of points indicated in the back of the card.

Closing: The team with most points is the winner.

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Students should actively participate in the game.

SESSION INFORMATION

Week: 28

Session: 112

This content will be given in two sessions

Expected learning outcome: Identify the importance of trade and transportation networks within the context of a globalized economy.

CONTENT DELIVERY

Start: Individually, students should answer the questions in the section *Apply your knowledge*. Elicit answers.

Development: Divide students in two groups. Both groups will read pages 104 and 105 but team A will make questions about the content in both pages. Team B will get ready to be interviewed on the content of both pages. Set the classroom to have a large forum. Chairs should be set "face to face". Tell students in team A that they will be a TV channel news reporters and Team B will be economics experts. Then, in pairs, they will do the interview. Monitor their work.

Closing: Select a pair to perform in front.

Apply your knowledge

Answer in your notebook the following questions with the information in maps 4.4 and 4.5.

1. Which are the regions of the world with less commercial exchange? What do you think are the reasons for this?
2. Mention three countries with which Mexico maintains commercial exchange; the ones with larger percentage according to exports and imports.
3. Identify which Mexican region is best communicated by means of transportation. Why do you think that is so?
4. Mark the reasons why commercial routes and transportation are concentrated in the most industrialized countries.

Trade Regions, Alpha Cities and Financial Services in the World

Nowadays, commercial exchange in a globalized world works better when it is done in economic blocks. Countries forming an economic block buy and sell products among one another, diminishing or eliminating import taxes and duties. Some economic blocks relate beyond commercial features, they also share social, cultural and political aspects (Map 4.7). The principal economic blocks in the world are:

The European Union founded in 1958 changed its name when the Euro was established as the official **currency** in countries integrating the community. The countries forming the union have reached many of their goals, such as: developing an internal exclusive market, with no duty fees, where the culture, technological progress, peace, social protection, currency, security and policies are shared. The inclusion of the former socialist countries

in 2004, strengthened the political union, but it weakened it in some economic aspects.

The European Union is the best example of functionality of an economic community within globalization. Each one of the member countries preserves its own governments, political and economic decisions, but at the same time they share group decisions and maintain their national integrity. To a great extent, it works because the member countries share culture, history and economic development.

The Asia-Pacific Economic Cooperation was created in 1989, with the purpose of strengthening the growth of the countries sharing that Pacific region. It is oriented, to the promotion and easement of commerce, commercial exchange with fewer taxes and more freedoms (Table 4.5).

The North American Free Trade Agreement (NAFTA) was enforced in 1994; it is integrated by three countries: Canada, the United States and Mexico.

Due to the territorial expansion of these countries and the economic importance of the first two, it is a regional block where the economic differences affect the free movement of many products.

The United States is the country that holds greater relationships with Mexico, mainly exports.

The term "alpha cities" was born in the frame of global distribution of goods, and has been generalized to name those urban centers that

GLOSSARY

Currency. Foreign money to the monetary unit of a country.

Asia-Pacific Economic Cooperation Member countries

Australia	New Zealand	Mexico
Brunei	Philippines	Papua New Guinea
Canada	Singapore	Chile
Indonesia	Thailand	Peru
Japan	United States	Russia
South Korea	Taiwan	Vietnam
Malaysia	China	

TABLE 4.5

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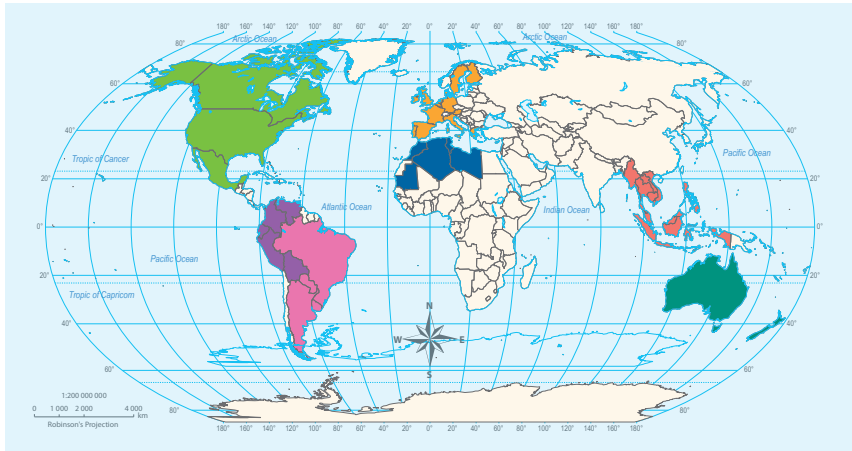
SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Bodily/Kinesthetic skills: Acting.

EVALUATION OF CONTENT

Students should actively participate in the roleplay.



MAP 4.2 Economic blocks in the world.
SOURCE: Self elaboration based on Bernard Guillochon, *La Globalización, ¿un mundo para todos?* Larousse, Barcelona, 2003.

Kells

have a series of characteristics related to globalization, such as: a) concentration of industrial activities and mainly services, commerce and tourism; b) they are the most populated cities in the world and possess a large metropolitan area; c) efficiency in transportation systems and communications; d) technology, science and even fashion; e) holding of the headquarters of transnational companies; f) important financial centers nationally and internationally; g) they conduct international events of great importance like the Olympic games, soccer tournaments, political, economic or cultural encounters; h) being **cosmopolitan** cities.

New York is the best example of an alpha city; it is considered the economic center of the world. It is the where the most important stock market and the main American banks are located.

The financial services are those controlling money in the world; they are part of commercial activities they help with the cash flow from transactions. This sector has a very important function in modern economy, because commerce is the primary axis in globalization's policy. Financial services are represented by banking institutions, insurance companies, fund managers and stock markets.

To Learn More

Some cosmopolitan cities are: London, Tokyo, Paris, Hong Kong, Chicago, Los Angeles, Singapore, Sydney, Toronto, Boston, Shanghai, Beijing, Madrid, Vienna and Berlin.

GLOSSARY

Cosmopolitan. A common place to all countries.

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SESSION INFORMATION

Week: 29

Session: 113

This content will be given in two sessions

Expected learning outcome: Identify the importance of trade and transportation networks within the context of a globalized economy.

CONTENT DELIVERY

Start: Individually, students should answer the questions in the section *Apply your knowledge*. Elicit answers.

Development: Divide students in two groups. Both groups will read pages 104 and 105 but team A will make questions about the content in both pages. Team B will get ready to be interviewed on the content of both pages. Set the classroom to have a large forum. Chairs should be set "face to face". Tell students in team A that they will be a TV channel news reporters and Team B will be economics experts. Then, in pairs, they will do the interview. Monitor their work.

Closing: Select a pair to perform in front.

Project preparation: Everyone should take half piece of cardboard and markers.

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Bodily/Kinesthetic skills: Acting.

EVALUATION OF CONTENT

Students should actively participate in the roleplay.

SESSION INFORMATION

Week: 29

Session: 114

Expected learning outcome: Identify the importance of trade and transportation networks within the context of a globalized economy.

CONTENT DELIVERY

Start: Ask students to say names of transnational companies. Elicit and have a student to list them on the board. Tell students that they will talk about them and some organizations that control world economy.

Development: Divide the group according to the teams you previously formed. Team 1 will read the introduction; the rest of the teams will read one segment of the chart and make a poster to explain their segment.

Closing: Reorganize everyone into round tables in which there is a representative of each team. They will roleplay a congress in which everyone will explain to the rest the part they read as if they were the leaders of such organizations. The person in charge of the introduction will be the facilitator of the round table.

Presentation preparation: Divide the group into seven teams. Each team will present one of the following topics: Littoral tourism, cultural tourism, urban tourism, consumption tourism, rural tourism, ecotourism and adventure tourism described on pages 107 and 108.



FIG. 4.8 PEMEX is the most important public industry of the country.

TABLE 4.6

International Economic Organizations and Transnational Companies around the World and in Mexico

Economic organisms are essential for international organization: comprehension and analysis of global economy require that we know its characteristics and functions. The most important are mentioned in table 4.6.

In order to understand transnational companies, it is necessary to make clear the difference between public and private sectors. In the public sector, we find the companies managed by the government, which generate benefits for the inhabitants of a country. In Mexico, an example of this is PEMEX (Fig. 4.8).

Transnational companies are those in the private sector that have accomplished a development so large that they leave the boundaries of their own country. They are present in many parts of the world at the same time. Governments of less developed countries can profit from these companies establishing in their territory, particularly because they can help to solve or

diminish the problem of unemployment that they have not managed to solve.

The 200 most powerful companies are the ones ruling global politics: the total income of these multinationals, makes up for about a fourth (26.3%) of the global production. Among those transnational companies we find: Shell, General Motors, Ford, Exxon, IBM, Mitsubishi, Toyota, Philip Morris, General Electric, etc.

The Group of the Seven (G7) concentrates 80% of the multinational companies. Most of the multinational companies belong to the most industrialized countries, where they have an important number of subsidiaries and where they concentrate the largest part of the investments.

In Mexico, government policies have improved the environment for investors. In the past years, transnational investments have grown in such a way, that is very complicated for the government to control them all.

International economic organism	Characteristics and functions
International Monetary Fund (IMF).	Its main function is the stability of international finances. Its task is to create a fund that can be used as loan to the most affected countries during global economic crisis. There are 123 member countries.
World Bank	It is in charge of giving developing countries a small part of the financial resources they need. Its purpose is to diminish poverty through low interest loans, no interest loans on a banking level and economic support for developing nations. There are 186 member countries.
World Trade Organization (WTO)	It deals with global commerce. It organizes and manages the commercial agreements between its members; in addition, it is a multilateral negotiation forum. It supervises commercial policies and cooperates with the World Bank and the IMF. There are 153 member countries.
Organization for Economic Cooperation and Development	It is an economic organism of international cooperation in developed countries. Its main function is to coordinate the economic policies of industrialized countries. The coordination is performed during the celebration of the G7 summit. This group of countries is called G7, because they are the seven most industrialized countries in the world, whose political, economic and military weight is quite relevant on a global scale. The member countries are: Germany, Canada, the United States, France, Italy, Japan and the United Kingdom.

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SKILLS DEVELOPMENT

Critical thinking skills: Brainstorming.

Interpersonal skills: Working as team members, teaching others.

Bodily/Kinesthetic skills: Acting.

EVALUATION OF CONTENT

Students should actively participate in the round tables. They should also make their poster.

How much did I learn?

In the next activity you will identify the importance of commerce and transportation networks in the context of globalization.

Work in pairs and follow the instructions. Write your answers in your notebook.

1. Choose a product that belongs to a transnational enterprise. Find out where it comes from and where it is produced.
2. Investigate how these products are delivered to Mexico and to other countries.
3. Share your work with the rest of your classmates and your teacher.

Types of tourism

How much do you know?

1. Where did you last go on vacation? Is tourism a profitable activity?
2. How many types of tourism do you know? Mention them.
3. Is there any tourism in the city or municipality where you live? What kind?

The characteristics of geographical space, whether they are natural, cultural, gastronomical or economic play an important role in the type of tourism we choose to do.

Nowadays, the types of tourism are related to the preferences of tourists and their purchasing power, advertising, the beauty of the landscapes, and technological and historical attractiveness.

Littoral tourism also known as sun and beach, is located in coastal regions with accessible beaches (Fig. 4.9).

Cultural tourism is directed to offer visits, guided tours, conferences related to archaeological sites, museums, showing the customs and traditions of the peoples with events or places of literary or bibliographical nature, architectonic places, etc. This type of tourism is related to the social and cultural components of geographical space.

Urban tourism is conducted in urban centers. These cities bring recreational activities that range from culture, visiting shopping malls, new technologies fairs, and even activities related to night life. Alpha cities like New York, Paris and Madrid are an example of these, they receive thousands of visitors per year (Fig. 4.10).

Consumption tourism is focused on buying certain items. This activity is almost exclusive to cosmopolitan cities, where the offer of products is vast, for example fashion clothes.

Rural tourism is attractive when there are old facilities and villages that, once they are refurbished and adapted, are pleasantly managed offer good quality services, sometimes by their owners.



FIG. 4.9 Acapulco beaches.



FIG. 4.10 The Louvre Museum is one of the most visited in the world.

→ Expected Learning

Identify the types of tourism and their economic importance around the world and in Mexico.

To Learn More

Tourism is defined as the national or international industry for transportation and entertainment of millions of individuals who travel, whether it is inside their country or to another country.

SESSION INFORMATION

Week: 29

Session: 115

Expected learning outcome: Identify the types of tourism and their economic importance around the world and in Mexico.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations about different kinds of tourism. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

Homework: Students should get a world map and a map of Mexico with names.

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SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

SESSION INFORMATION

Week: 29

Session: 116

Expected learning outcome: Identify the types of tourism and their economic importance around the world and in Mexico.

CONTENT DELIVERY

Start: Students will name the seven types of tourism. Elicit answers.

Development: Students will read the section *Distribution of the Main Touristic Centers in the World and in Mexico* and in the maps they were told to bring, they will locate the places that are mentioned in the text. Check students' maps.

Closing: Students should answer the section *Apply your knowledge*. Elicit answers.

Project preparation: Divide the group in four or five teams. Students will present a project about their local area. They should follow the instructions which are described in the section *How much did I learn?* On page 110 and present it the following class.

Ecotourism offers travelling to natural virgin areas, or that are well preserved with the purpose of studying, admiring and enjoying the natural landscape. These areas become quite enjoyable for tourists just as the cultural manifestations do and is one of the basic objectives of this type of tourism to teach environmental education, to create and promote an environmental conscience through recreational activities.

In Mexico there is an ecotourism network, some examples are: the Tuxtlas region in Veracruz and Mazunte, better known as the National

Mexican Turtle Center, and Ventanilla, a place where a protection project of endangered flora and fauna was created; located to the west of Oaxaca.

Adventure tourism generally implies travelling to remote places. Usually there are risky activities, like rappelling, horseback riding, coastal navigation, surfing, mountain climbing, hiking, touring by bicycle. All of these are activities that require enthusiasm and strength.

Distribution of the Main Touristic Centers in the World and in Mexico

The most visited touristic regions in the world coincide with developed countries: the United States and Western Europe, where there are many alpha cities.

The old world abounds in historical, cultural and natural places that are quite attractive to tourists.

The European continent receives millions of tourists of all kinds. Alpha cities like: Paris, Madrid, London, Berlin, Rome, offer cultural services as well as consumption and technology services, etc. In the last decade, Spain has become one of the countries receiving the most tourists on the entire planet.

Switzerland is one of the most visited countries, on the one hand, there is adventure and ecotourism in its mountains, and on the other hand, there is business tourism, since inside its territory are the and most important banks in the world. The most visited cities of Asia are Bangkok, Hong Kong,

Singapore, Shanghai, New Delhi and Kolkata. Some of these are visited for their historical and cultural greatness, and others because they have become industrial and commercial centers worldwide, such as the case of Singapore and Shanghai.

In Latin America, Mexico is the country that has been most visited by international tourism, as well as the Dominican Republic and Brazil.

In 2002, the number of tourists that came to our country was more than 20 million, more than half stayed at the borderline crossings; it is estimated that four million tourists travelled to the touristic centers of Quintana Roo: Cancun and the Mayan Riviera, which are the largest attractions. A little more than two million traveled to Mexico City (Map 4.8).

Information from the Ministry of Tourism revealed that more than 80% of international tourists come from the United States, almost 4% comes from Canada and the rest comes from Europe and Latin American countries.

Apply your knowledge

Look at the map of tourism in Mexico (Map 4.8) and follow the next instructions. Write your conclusions in your notebook.

1. Identify the types of tourism in Mexico and order them according to their importance.
2. What are the main destinations for international tourists? What are the types of tourism found there?
3. Identify the regions in our country where tourism and culture are concentrated. Explain why.

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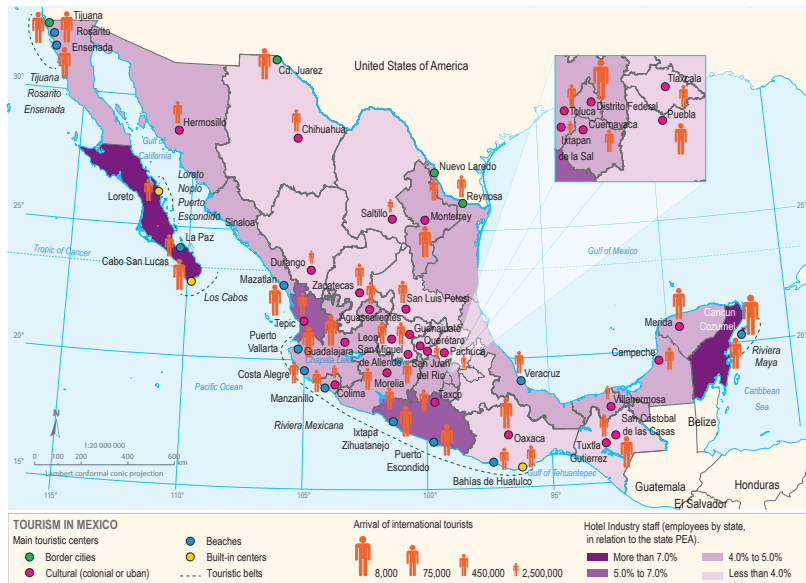
SKILLS DEVELOPMENT

Visual/Spatial skills: Locating places.

Critical thinking skills: Applying knowledge.

EVALUATION OF CONTENT

Check students' maps and their answers to the section *Apply your knowledge*.



Economic Importance of Tourism in the World and in Mexico

Tourism has become one of the most important activities in the world. The income generated by tourism represents one third of the total value of international exchange; in numbers, it makes up for 8% of the total global service exports. In the case of Mexico, the entrance of currencies is only larger than the sales of oil, and just recently, the in-bond assembly industry.

Touristic activities generate a lot of jobs; including airlines, hotel consortiums, travel agencies, touristic operations, construction companies and food suppliers, merchants and local residents of the hosting communities. The UN proposes that the poorest countries develop touristic projects as a strategy to achieve economic development. The largest portion of these countries has ideal features for littoral and cultural tourism. Even though

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SESSION INFORMATION

Week: 30

Session: 117

Expected learning outcome: Identify the types of tourism and their economic importance around the world and in Mexico.

CONTENT DELIVERY

Start: Ask students if they know anyone in their family or friends who works in the touristic sector. Elicit answers. Students should read page 109 and top of page 110.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

SESSION INFORMATION

Week: 30

Session: 118

Expected learning outcome: Compare the socioeconomic differences in the world and in Mexico.

CONTENT DELIVERY

Start: In teams of four students, they will answer the questions on page 110, in the section *How much do you know?* Elicit answers. Then, help them define the term: Human Development Index.

Development: Students will read page 110 and the tables 4.7 and 4.8 on page 111. Ask students comprehension-check questions about the information on the page and tables.

Closing: Students will determine why they think the top ten countries with the highest human development index have been ranked in that order.

→ Expected Learning

Compare the socioeconomic differences in the world and in Mexico.

GLOSSARY

Per capita income. The total of the average profit obtained by the inhabitants of a country during a determinate period of time, generally comprising one year.

110

the projects were successful in the first decades, they require a high rate of investment that has been absorbed by international consortiums, consequently, most of the airlines, hotels and travel agencies are operated by these consortiums. In Mexico, there are still important national investments.

The touristic structure is formed by 14 hotel, food and beverages companies, even though they are not all focused entirely on tourism, but are rather a part of the everyday life of the inhabitants of this country, their distribution reflects somehow, the importance of touristic centers, especially those concerning bars and night clubs.

How much did I learn?

Work in teams of three to develop a touristic project for your state, city or community.

Make teams of three or four members and find out about a touristic project in your state, city or municipality.

1. Determine the types of tourism that can be developed according to the natural, social, economic and cultural characteristics of the place you choose, and draw a map of it.
2. Make a list of the specific places to visit, (museums, archaeological areas, beaches, natural recreation spaces, etc.) and the hotels, restaurants and commerce to satisfy tourists' needs. Locate them in the map you drew.

Explain to the rest of your classmates why your touristic project is important.

Human Development Index and its Expression in the World and in Mexico

How much do you know?

Work in pairs to analyze and answer the following questions.

1. Are there socioeconomic differences between the countries in the world? What are those differences? Make a list.
2. Which do you think are the reasons for these socioeconomic differences in the world? Are there socioeconomic differences in the city or community where you live? Which are they? Explain.

The Human Development Index (HDI) was created with the purpose of classifying the countries with different variables to the ones traditionally used in economy. The United Nations Development Programme (UNDP) has been proposing and calculating these variables since 1990.

Intellectuals at the UN consider that the development of a country cannot be solely understood by means of economic growth since human development is linked to the freedom to choose several options and ways of life.

The HDI evaluates the development concept in a broader way than the **per capita income**, it is an index that combines four indicators in three dimensions: the average personal income, health indicators, life expectancy

and education. The UNDP report of 2010, calculated the HDI for 139 countries. This report classified the countries as very high, high, medium and low human development (Tables 4.7 and 4.8).

The countries that appear in the list are the first ten appearing in the UNDP. Mexico ranks number 56 with an index of 0,750 within the High Human Development classification.

The main objective of the HDI is to guide the government's, international institutions' and non-government organizations' attention towards a development of human beings and find solutions on how to improve the progress of societies.

Kells

SKILLS DEVELOPMENT

Critical thinking skills: Analyzing.

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Students should actively participate in defining the reasons why the countries with the highest human development were ranked in that order.

Very High Human Development	High Human Development	Medium Human Development	Low Human Development
Norway 0,938	Bahamas 0,784	Fiji 0,669	Kenya 0,470
Australia 0,937	Lithuania 0,783	Turkmenistan 0,669	Bangladesh 0,469
New Zealand 0,907	Chile 0,783	Dominican Republic 0,663	Ghana 0,467
United States 0,902	Argentina 0,775	China 0,663	Cameroun 0,460
Ireland 0,895	Kuwait 0,771	El Salvador 0,659	Myanmar 0,451
Liechtenstein 0,891	Latvia 0,769	Sri Lanka 0,658	Yemen 0,439
Netherlands 0,890	Montenegro 0,769	Thailand 0,654	Benin 0,435
Canada 0,888	Romania 0,767	Gabon 0,648	Madagascar 0,435
Sweden 0,885	Croatia 0,767	Suriname 0,646	Mauritania 0,433
Germany 0,885	Uruguay 0,765	Bolivia 0,643	Papua New Guinea 0,431

TABLE 4.7 Human Development Index 2010, published by the UNDP.

High Human Development	Low Human Development
Mexico City 0,9054	Guanajuato 0,8031
Nuevo Leon 0,8797	Zacatecas 0,8031
South Baja California 0,8659	Puebla 0,7998
Chihuahua 0,8588	Tlaxcala 0,7973
Baja California 0,8557	Hidalgo 0,7938
Coahuila 0,8551	Michoacan 0,7823
Sonora 0,8541	Veracruz 0,7799
Quintana Roo 0,8550	Oaxaca 0,7611
Aguascalientes 0,8499	Guerrero 0,7594
Tamaulipas 0,8455	Chiapas 0,7395

TABLE 4.8 Human Development Index 2010 in Mexico.

Categorization of the Central and Peripheral Countries According to their Economic Activity

Apply your knowledge

Examine tables 4.7 and 4.8 and map 4.9 of the HDI and write the answers to the following questions in your notebook.

1. Where are the countries with a very high HDI located? Where are the ones with a low HDI located?
2. Does the information match with the per capita income of countries with less human development?
3. Does the data and information of the Mexican HDI coincide with the information about the indigenous population?

Kells

In accordance with the distribution of economic activities, the world is divided now into central and peripheral countries. Countries that have given rise to stronger economies with notable technological and organizational progress are the central countries; they concentrate industry, services, commerce and

are where the most important financial capitals in the world originated. They also dominate the exploitation of natural resources and get to intervene in the exploitation and commercialization of the resources of less developed countries, that is, the peripheral countries.

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SESSION INFORMATION

Week: 30

Session: 119

Expected learning outcome: Compare the socioeconomic differences in the world and in Mexico.

CONTENT DELIVERY

Start: Students should work in pairs. They will answer the questions in the section *Apply your knowledge* on page 110. Elicit answers.

Development: Students should read the rest of the page and the top of page 112. Students should clearly identify central countries, economic regionalization and peripheral countries. Help them with the definition and how they can categorize countries.

Closing: Students should present their classification, according to the definition they got.

Homework: Organize six teams. Each team will do research on one of the following countries: The United States, Germany, Japan, Mexico, Malaysia, and Croatia. about the human development index in those countries in order to compare them.

SKILLS DEVELOPMENT

Critical thinking skills: Comparing and contrasting.

EVALUATION OF CONTENT

Check the classification students give.

SESSION INFORMATION

Week: 30

Session: 120

Expected learning outcome: Compare the socioeconomic differences in the world and in Mexico.

CONTENT DELIVERY

Start: Students should be mixed; one who did research on a rich country with one who did research on a poor one in order to state differences between them. Elicit answers.

Development: Students should read page 112 and compare the information with the exercise they have just completed.

Closing: In pairs, students are to find ways to lessen the gap between Mexico HDI and that one in the U.S. Elicit answers.

GLOSSARY

Commercial balance. The difference of what is left in a country between what it sells and what it buys, in other words, the remaining difference between exports and imports.

Peripheral countries gravitate around central countries; all of these territories were once colonies of exploitation belonging to the central countries, creating economic and political independence from those who have historically exploited their natural richness. In some peripheral countries, industrialization is minimal or non-existent. This turns peripheral countries into exporters of raw materials and central countries into controllers of the production of raw materials and manufactured goods in global commerce.

Commercial balance among central and peripheral countries is unbalanced. Central countries buy the raw materials at a low price and sell the finished goods at a high price, thus causing the commercial balance to be uneven; you sell cheap and you buy expensive.

Additionally, within central countries, the most important are the ones that become protectors of the transnational corporations: the United States, the European Union, China and Japan.



FIG. 4.11 Norway has the highest Gross Internal Product (GIP) per capita in the world, over 53 thousand dollars a year. Is it the happiest population in the planet?

Differences between the Human Development Index Map and the Central and Peripheral Countries

The countries with the highest Human Development Index are the central countries: the United States and its political and economic allies. The population in these countries has a higher life expectancy, longer years in education and a high per capita income; all of this translates into the fact that the inhabitants have the possibilities and freedom of accessing a fuller and dignifying life.

The United States is not on the top of the list, however. This country presents social and economic problems for having such an abounding immigrant population; its political and economic role turns it into the largest attraction center, in addition to creating bonds and agreements with its allies throughout the world.

The Scandinavian countries: Norway, Sweden and Finland, which are located in the Scandinavian Peninsula, are traditionally societies with high lifestyles and high per capita incomes (Fig. 4.11).

Nowadays, the European Union countries share political and economic world power with the United States. However, the majority of these countries has immigration problems, mainly African immigrants.

Peripheral countries coincide with the medium and low levels of the HDI, Latin America, Africa and a large part of Asia is considered in these levels. Africa is where the levels of education, health and income are the lowest.

Some countries like Mexico, Argentina and Chile, reached high levels in the HDI in 2010, which is why they are called semi-peripheral countries.

The case of China is quite significant, with it we can make some terms clear. Its HDI is medium, even less than Mexico's. Despite economic growth, it does not have any consequence in the wellbeing factors of its population; this happens because the economic growth represents only the increase in material production, and development implies that said production affects the socioeconomic wellbeing of the population.

112

SKILLS DEVELOPMENT

Critical thinking skills: Comparing and contrasting, problem solving.

EVALUATION OF CONTENT

Monitor students' work. Everyone should actively participate in the countries comparison and name ways to lessen the gap between Mexico's HDI and the one in the U.S.

Socioeconomic Inequality in the World and in Mexico

Some countries grow economically, and with it, their life expectancy increases, as well as technological progress and wellbeing, all of these usually result in a high HDI. This is what we call economic development. For central countries, the levels are always increasing, whereas in peripheral countries, the levels are always decreasing, thus advancing inequality worldwide.

Globalization is one of the main factors that affect the center and the periphery, because this economic policy forces all countries in the world, particularly peripheral countries, to get involved in the market as consumers of finished goods and suppliers of raw materials. Production, to a greater or lesser degree, is directly influenced or directed by transnational companies,

which implies a kind of production that does not affect the social wellbeing of the population in any way.

Latin America is where you find the largest inequalities in HDI. These levels of inequality become obstacles for regional development.

According to the Regional Human Development Report for Latin America and the Caribbean of 2010, Mexico ranks number 56 worldwide and number 8 in Latin America and the Caribbean for its index in social inequality.

On average, Mexico maintains a high HDI, there are many states that are well below the limits, they are the states in the southeast; whereas the entities with higher indexes are Nuevo Leon and Mexico City (Map 4.9).



SESSION INFORMATION

Week: 30

Session: 120

Expected learning outcome: Compare the socioeconomic differences in the world and in Mexico.

CONTENT DELIVERY

Start: Ask students if they remember which rank Mexico has in HDI. (Answer: 56). Remind them of the solutions they proposed the previous lesson to lessen the inequity gap with the U.S.

Development: Students will read the page. Ask comprehension-check questions.

Closing: Students will propose ways to lessen the gap in HDI among Mexico's states.

SKILLS DEVELOPMENT

Critical thinking skills: Remembering, problem solving.

Reading skills: Scanning, reading for detail.

EVALUATION OF CONTENT

Check students' answers to your comprehension-check questions; check that everyone actively participates in the proposals elaboration.

SESSION INFORMATION

Week: 31

Sessions: 121, 122

Expected learning outcome: Apply information of the unit to develop and present a project.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

Project

Socioeconomic Problems

The project in this unit aims at helping you work, research, develop and present a situation that deals with the socioeconomic problems of the world's population; its urban and rural settlements in geographical space, the use of resources and conservation, industries and their products, distribution and influence in your community. Read the following text which offers you a situation that you can use as an example to develop your project. Remember to follow

the steps included in the project in unit 1 (pages 32 and 33); start with a question to foster curiosity, research the topic to answer and increase knowledge, develop all possible scenarios resulting from your research, present your work and always look for your project to provide benefits to your community.

→ Reading

Tláhuac: economic activities and urbanization

Tláhuac territory is located to the East of Mexico City. This delegation is characterized for being semi-rural, with very little industrial activities, urban infrastructure and services. Line 12 of the subway systems is one of the most important works in the region.

Tláhuac has a relevant value as an environmental reserve, because its surface is a very important vein for the supply of aquifers in the valley of Mexico. The industrial sector in this delegation is scattered in its northernmost region, but there are

an important number of industries, particularly those from the food sector. Urban growth of the Tláhuac territory has been marked by the disorganized way in which it has been made, especially to the south of the delegation. The urbanization process has not stopped; between 1997 and 2008, more than 41 hectares set aside for ecological conservation were lost.



Tláhuac loses conservation ground to 93 old settlements

One of the problems currently endangering this region of Mexico City, is the expansion of urban settlement onto the conservation grounds. Occupying lands or building houses this periphery produce changes in the use of the soil and an alteration of the environment that directly affects the disappearance of agricultural areas, as well as the loss of grounds with high environmental value for Mexico City.

In lands where once there were crops, pastures, bushes and trees, they have now given way to disorganized constructions, loads of gravel, paved streets or dirt, sand or stone roads; although there are areas in which the inhabitants have higher incomes and resources.

Commerce is also growing in these irregular settlements, which is why little markets, hardware stores, drugstores, hair salons and stationary suppliers are flourishing. The strategic actions proposed by the jurisdiction of Mexico City are:

1. Support urban reorganization.
2. Support little industries and employment.
3. Improve public transport.
4. Improve the environment.
5. Improvement and construction of infrastructure.

Alejandro Ramos. "Pierde Tláhuac suelo de conservación con 93 asentamientos añejos", at Reforma, Sunday, April 6th, 2008. p.2. Adaptation.

Kells

114

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Evaluation

What I have learned

Read the following questions carefully and answer them.

- Mexico has agricultural, livestock, forestry and fishing spaces. Write one example of each resource.
Students' own answers.
- What is the importance of mineral and energetic resources in Mexico?
They both are economic activities and the products are exported worldwide.
- What types of industries exist in Mexico? Write two examples.
Because transportation makes possible the commercialization of products.
- Commerce and transportation are two activities closely related. Why?
Automotive, steel, petrochemical, in-bond assembly, textile and food.
- In Mexico, tourism is very important for some areas of the country. Write some types of tourism that you have studied in this unit.
Littoral, cultural, urban, consumption, rural, ecotourism and adventure.
- What is Human Development Index?
It is a measure that evaluates the development concept, it has three dimensions: the average personal income, health indicators and life expectancy and education.

Self-Evaluation

Read each key aspect to evaluate and tick (✓) the ones you have achieved.

Key aspect to evaluate	I do it very well	I have a hard time doing it	I need help to do it
I can identify the differences in managing natural resources in agricultural, livestock, forestry and fishing spaces around the world and in Mexico.			
I can explain the importance of mineral and energy resources around the world and in Mexico.			
I can identify the types of industries and the importance of industrial spaces in economies of the world and Mexico.			
I can identify the importance of trade and transport networks in the context of globalized economy of the world and of Mexico.			
I can compare the socioeconomic differences of the world and in Mexico.			

Peer-Evaluation

Work in pairs and check your knowledge.

Key aspect to evaluate	I do it well	I have a hard time doing it	I need help to do it
Recognize types of tourism and their economic importance around the world and in Mexico.			
Compare the socioeconomic differences of the world and in Mexico.			

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SESSION INFORMATION

Week: 31

Sessions: 123, 124

EVALUATION AND SELF EVALUATION

CONTENT DELIVERY

Start: Students should answer page 115 (Evaluation) prior to taking the unit assessment. Go through the answers; help them with techniques to study content they do not clearly remember.

Development: Students are to take the unit assessment. You can find it in the Teacher's Guide pages 156 and 157 along with the answer key on page 158.

Closing: Check their assessments, record the score and provide with feedback. You might want to use the Attendance and Evaluation formats that you can find the Teacher's Guide pages 166 and 167.

SKILLS DEVELOPMENT

Metacognitive skills: Self-monitoring, self-evaluating learning outcome.

EVALUATION OF CONTENT

Check the unit assessment answer key on page 158.

Student book U5

SESSION INFORMATION

Week: 32

Session: 125

Expected learning outcome: Identify topics in the unit students consider will be hard to understand in order to make a study plan.

CONTENT DELIVERY

Start: Have students analyze and identify what they could do well in units 1 through 4; as well as what they should improve in unit 5. Ask them, for instance: What topics were easy? Did your previous study plan work? Didn't it work? Why? Did you really follow your study plan? Students should write down their reflections.

Development: Have students check the skills, learning outcomes and key concepts in unit 4. Ask them to identify the topics they consider the hardest ones. Then, they should plan how to study them and do better than the previous unit. If a strategy didn't work, then they should find another one. Help them with ideas. (Drawing mind maps, discussing with partners, making their own exams, making timelines, making associations, etc.)

Closing: Students should write down their study plan and have it checked.

UNIT 5 Our World

Skills

- Participation in the space we live in.

Expected Learning

- Explain the relationship between the quality of life and environmental sustainability around the world and in Mexico
- Recognize the participation of Mexico and representative countries in environmental care and sustainable development
- Appreciate the importance of Protected Natural Areas, environmental services and clean technologies around the world and in Mexico
- Identify the main risks and vulnerability of the population around the world and in Mexico
- Acknowledge the importance of the participation of government and society in the prevention of disasters around the world and in Mexico
- Recognize basic actions to prevent disasters in local environments.

Project
Natural Risks

Evaluation

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SKILLS DEVELOPMENT

Metacognitive skills: Planning, organizing studies content.

EVALUATION OF CONTENT

Students should get their study plan checked by the teacher.

Situations that Influence the Quality of Life around the World and in Mexico

How much do you know?

Norway and Niger



The UN has placed Norway as the country with the highest quality of life in the world, judging with three parameters: level of income, level of education and life expectancy, which is 81 years of age. Jon and Ida's income is slightly higher than the average. They own a cabin on the mountain, inherited from Ida's parents, and a house by the sea, inherited from Jon's family. Like everyone else, they prioritize sports. Norwegians tend to austerity regarding material consumption.

Ignacio Vidal-Folch, "Noruega paraíso del Norte", in *El País*, Sunday December 11th 2005, pp. 60-70 (adaptation).



The UNPD places Niger in one of the last places. 60% of the population lives on less than one euro a day; 85.6% of adults are illiterate and the life expectancy is 44 years of age.

In most of Niger's villages, there is no electricity or water. Women, like Hediza, must walk several kilometers per day to get the five liters of water their family needs; it is not like our water; clean, fresh and transparent, it is brownish-gray and unhealthy looking.

Abalene's school is outside of Agadez. There are 565 elementary school students distributed in approximately ten classrooms with electricity, some were built with German money, others with money from a French association of friends.

Ramón Lobo. "Niger enfermo en el sur", in *El País*, Sunday December 11th 2005, pp. 72-78 (adaptation).

The UNPD's report is devastating: Niger has one doctor for every 33,000 inhabitants, and Norway, the country with the best quality of life in the world, has one doctor for every 280 people.

1. Look at the images, there are two women looking after their families. What are the differences?
2. Do Norwegian and Nigerian families have the same needs? Why?
3. Observe, analyze and describe the environment in both countries.
4. Which natural phenomena could affect the population in both regions? Are they at risk of earthquakes, cyclones, droughts, etc.? Explain why.

→ Expected Learning

Explain the relationship between quality of life and environmental sustainability around the world and in Mexico.

SESSION INFORMATION

Week: 32

Session: 126

Expected learning outcome: Explain the relationship between quality of life and environmental sustainability around the world and in Mexico.

CONTENT DELIVERY

Start: Have students discuss in whole class the following definitions: Life expectancy, income, level of education. Ask students how they would define quality of life.

Development: Students will read the text and compare the families in the pictures. Discuss differences they find and how quality of life and environmental sustainability are linked.

Closing: Students will discuss how they think good quality of life can be achieved in Mexico. What would they do? Would they modify the economy? The political system? Elicit conclusions.

Project preparation: Organize four to five teams. Divide the information on pages 118, 119 and 120. Teams will give a presentation about a segment including any other piece of information they consider relevant, maps to explain data and five comprehension-check questions to ask their partners. Explain the evaluation parameters.

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SKILLS DEVELOPMENT

Critical thinking skills: Observing, problem solving.

Verbal/Linguistic skills: Discussing, debating.

EVALUATION OF CONTENT

Students should be able to name aspects of good quality of life; they should also actively participate in the discussions.

SESSION INFORMATION

Week: 32

Session: 127

Expected learning outcome: Explain the relationship between quality of life and environmental sustainability around the world and in Mexico.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

GLOSSARY

Desertification. A process created by the economic and social activities of man: it consists of the deterioration of the soil, in which fertile soil, partially or completely, loses its productive capacity. This is a result of soil erosion and lack of water.

The Human Development Index (HDI) does not consider some important aspects to measure the quality of life of the population, since social needs go beyond the possession of material goods. In our globalized world we need: food, health, housing, education, socialization or social cohesion, information, recreation, clothing, footwear, transportation, basic communications, an optimal environment for development and the ability to cover these needs throughout life. Therefore, poverty is linked to the lack of these factors.

The Gross Domestic Product (GDP) is not related to the increase of life expectancy and well-being.

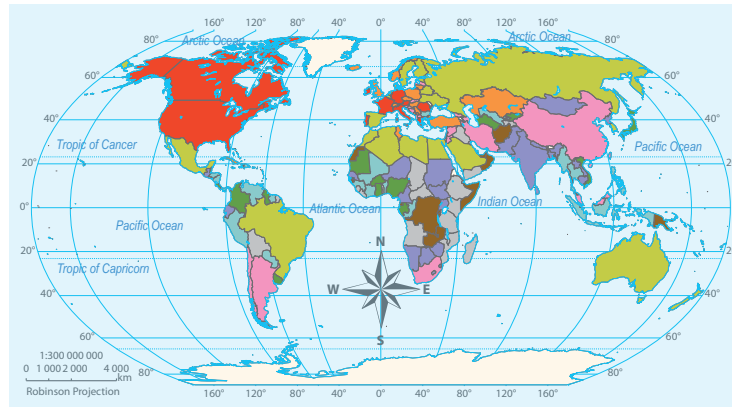
It may seem impossible that in the 21st century, when scientific and technological development has achieved unprecedented advances, there are still human beings who don't have the minimal daily calorie intake and die of starvation (Map 5.1). In 2011, in Somalia, there was a famine that affected millions of people due to political and economic problems between groups that fight for power. Moreover, drought and soil erosion cause an

important **desertification**, caused by instability created by the climate change.

The World Health Organization (WHO) in 1948 defined health as "a state of complete physical, mental and social well-being." Additionally, it recognizes that health is one of the basic human rights, and achieving the highest level of well-being depends on the cooperation of individuals and nations, and on the implementation of social and sanitary measures.

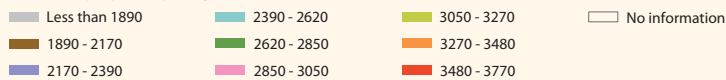
WHO proposes to measure the development of health services according to the number of beds per determined territory, or by the number of doctors per group of people (Map 5.2).

Education is closely related to people's quality of life and their levels of economic development. Their quality of life depends on the strength of institutions that apply and manage it. From the economic and human development point of view, education gives us access to knowledge, creativity, teamwork and the implementation of rules for coexistence. The latter is basic to achieving social well-being.



DAILY CALORIE INTAKE PER CAPITA

Kilocalories per person, per day



MAP 5.1 Shows the caloric intake per capita of the world's population.
SOURCE: chartbin.com/view/1150

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SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Literacy is an important parameter for measuring a society's education. Illiterate people, are frequently the poorest amongst the poor. The United Nations Educational, Scientific and Cultural Organization (UNESCO) states that "not being able to read increases social and gender inequality, since more than half of illiterate people are women." On map 5.3 there is information about illiteracy in the world.

Housing and the way it is used and enjoyed is one of the factors that determine a person's life. It represents the shelter human beings have, it houses the closest factors that give us quality of life. In more developed

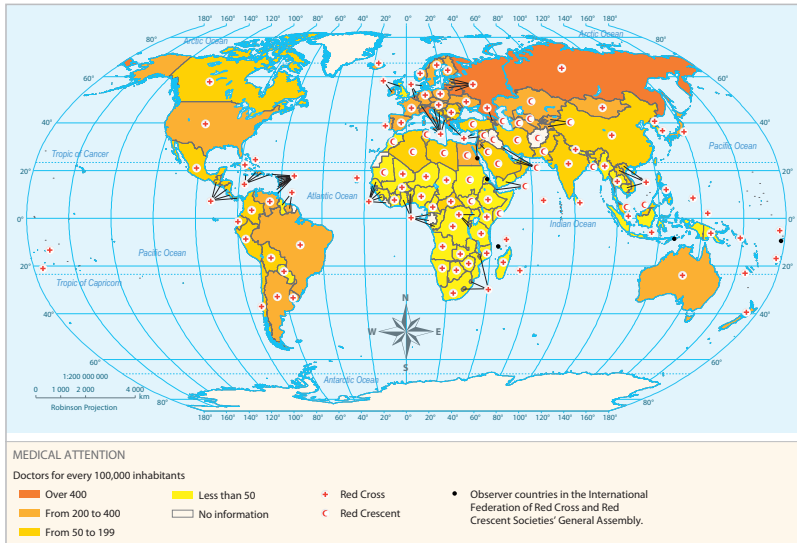
countries, access to decent housing is easier than in less developed countries, where access is unaffordable for many of their inhabitants.

We're not isolated beings, we are part of a social group, social cohesion gives us a level of agreement among the members of a group, or gives us the perception of belonging to a project or common situation. This fact gives us security, and as a result, is part of quality of life.

The natural environment is also fundamental to the development of our well-being.

Curious Fact

In the United States, the consumption of meat is three times higher than the world average.



SESSION INFORMATION

Week: 32

Session: 128

Expected learning outcome: Explain the relationship between quality of life and environmental sustainability around the world and in Mexico.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

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SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

SESSION INFORMATION

Week: 32

Session: 128

Expected learning outcome: Explain the relationship between quality of life and environmental sustainability around the world and in Mexico.

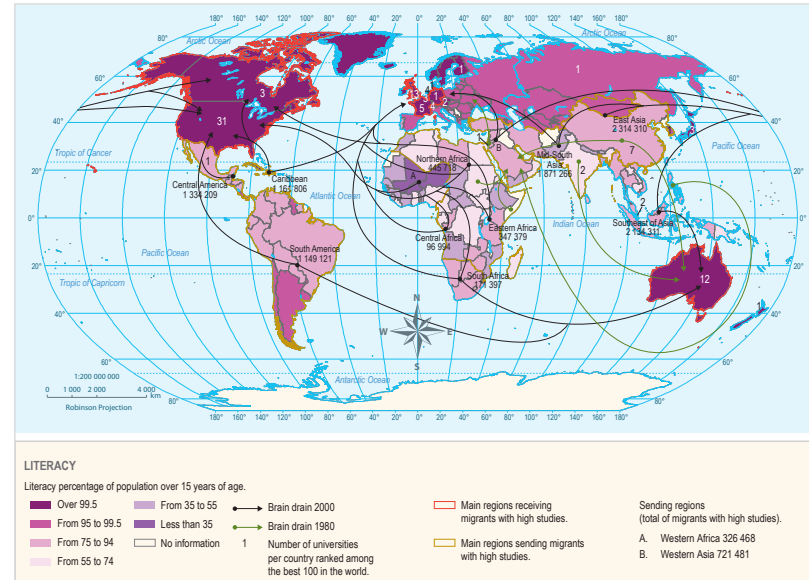
CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

MAP 5.3 Levels of literacy around the world.
SOURCE: data.worldbank.org



Apply your knowledge

Closely examine the maps about calorie intake, medical attention and literacy and answer the following questions.

1. Which are the regions with better food, health and education?
2. Which are the ones with worse conditions?
3. According to peripheral and central countries classification, which are the ones that have better quality of life; and, which ones have a worse quality of life? Explain why.
4. Check the information chart of Mexico, and the world maps on this subject. Explain, where you would place our country's level of quality of life.

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SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Relationship between Societies around the World with Different Quality of Life

If we link the economic development of peripheral countries to the central ones, the developed and underdeveloped, the interdependence between development and quality of life is clear.

Countries with a higher per capita income are not always on top of the

Relationship between Quality of Life and Environmental Sustainability

The environment also contributes to our quality of life: a) as a source of natural resources; b) as a physical and biological well-being provider, and c) as a psychological and recreational generator.

In the second half of the 20th century an objective of development was to reach a high level of industrialization and urbanization, as well as the automation of agriculture, a fast material population growth, and obtaining a high level of education and cultural values at the same time. Nature is the main provider, from material goods to cultural and value development. Government policies, especially in less developed countries, use this to plan production strategies for transforming natural resources into sought-after goods for economic and human development.

However, when converting nature into a simple exploitation source we cause massive underdevelopment and impoverishment, created by a high degree of environmental deterioration, consistent with a decrease in the quality of life in countries exporting raw materials.

Facing impoverishment in a large part of the world's population and environmental deterioration, the United Nations World Commission on Environment and Development proposed the policy for Sustainable Development in the Brundtland Report, in 1987.

quality of life list. Sometimes economic production is not reflected on the fulfillment of the population's needs, this is the case of the United States.

The quality of life in peripheral countries varies within the same population, even though the average is low. However, in Latin America, development and quality of life levels are different if we compare them to many African countries. That is why it is important to check the data of every country.

The use of electricity also involves a series of factors, including street lighting, the use of electric tools, artificial climate, industrial development, the use of medical instruments, among others.

Sustainable development is a policy of planned exploitation of natural resources that allows social development and the fulfillment of our needs, without creating an imbalance in the ecosystems. The idea is to preserve the natural legacy for future generations.

In this policy the following principles are considered: a) nature as a source of material goods, likely to deteriorate and dry up; b) economic production cannot stop, it provides us with all the material goods, and c) the social organization of the population has nature as its foundation, as a permanent good where we live and carry out our physiological and social activities. Economic production must be carried out under these principles, with equity, and with viable projects that support ecological systems.

Even though the sustainable development policy (Fig. 5.1) has been criticized, there have been great advances in international governmental decisions, as well as on the conscience of every citizen of the world, and it has started to yield small results. Ecotourism, environmental services, alternative energies, and recycling are some of the sustainable measures that are already being carried out in several parts of the world.

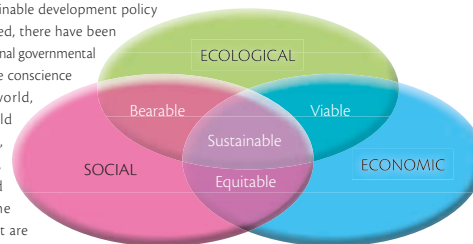


FIG. 5.1 Sustainable development.

121

SESSION INFORMATION

Week: 33

Session: 129

Expected learning outcome: Explain the relationship between quality of life and environmental sustainability around the world and in Mexico.

CONTENT DELIVERY

Start: Ask students what they know about the water supply in Mexico. Is there enough drinking water? How much water in the world is useful for human consumption? (Answer: 3%).

Development: Students will read page 121. In pairs, they will write seven comprehension-check questions. Once they finish, they will exchange notebooks with another pair and will answer each other's questions.

Closing: Students should answer the section *How much did I learn?* On page 122. Elicit answers.

SKILLS DEVELOPMENT

Humanistic skills: Sharing points of view.

Critical thinking skills: Formulating questions.

EVALUATION OF CONTENT

Students should get their questions checked by the teacher.

SESSION INFORMATION

Week: 33

Session: 130

Expected learning outcome: Recognize the participation of Mexico and representative countries in environmental care and sustainable development.

CONTENT DELIVERY

Start: Ask students if they have listened about meetings regarding sustainable development. Ask them too what they understand when they listen sustainable development. Elicit answers.

Development: Students should read the table on pages 122 and 123. Ask them questions about the table content. Ask them to find the objective of the Kyoto Protocol; discuss whether the meetings have been successful or not and why. Elicit answers.

Closing: Students will discuss what they would do to boost sustainable development. Elicit answers.

Homework: Students should take a device with Internet access to the following class.

→ Expected Learning

Recognize the participation of Mexico and representative countries in environmental care and sustainable development



FIG. 5.2 Climate change.

How much did I learn?

In pairs, read the text and answer the following questions.

Availability of water in Mexico.

The of available water in Mexico has decreased dramatically in the last half century. During this period it decreased 60% and it is foreseen that this tendency will continue. 11,000 m³ or more water per person, means "high" availability, not every inhabitant theoretically has 4, 547 m³, "intermediate" category. However, in the north, center and northeast of the country, where 77% of the population lives, there are only 1,300 m³ of water per inhabitant, category "extremely low".

La Jornada, edición especial, Agua, 2008. Disponibilidad de agua en México (Adapted), p. 12.

1. The text makes direct reference to the change in life style due to the decrease of available water in Mexico. Why?
2. What is the current availability of water? Do you have problems with water supply at home or school?
3. What are sustainable measures that can be taken in our daily life to avoid the "low" water availability?

International Meetings to Boost Sustainable Development and the Participating Countries

Industrial and urban development, intensive use of agricultural and farming soils, as well as massive exploitation of minerals, have environmental deterioration as immediate consequence. This worsens the poverty problem in underdeveloped countries. In 1968, intellectuals and scientists around the world created the Club of Rome in order to exchange opinions about

how to achieve steady economic growth for the whole world population.

Towards the 60's, the environmental problem increased so much that the United Nations Environment Programmed (UNEP) was created.

Since then there have been several meetings about this subject.

Examine chart 5.2 about the world meetings. The environmental problem is set first in a very general manner, and then, the deterioration phenomenon of each one is specified, until reaching a specific problem with alarming repercussions, such as climate change (Fig. 5.1).

World Meetings about the Environment

CHART 5.1 World meetings about the environment.

Conference		Objective	Participating countries
About human development	Stockholm, Sweden, 1972	<ul style="list-style-type: none"> • The environmental problem is identified as a factor that worsens poverty. • Defense and improvement of the environment for present and future generations. 	
Tbilisi, Environmental education	Tbilisi, Georgia, 1977	<ul style="list-style-type: none"> • Formal and informal environmental education programs are proposed in all the countries of the world. 	64
Nairobi Declaration	Nairobi, Kenya 1982	<ul style="list-style-type: none"> • The environmental situation is seen as a discouraging panorama. • It is meant to inform the international community about the future. 	55

122

SKILLS DEVELOPMENT

Interpersonal skills: Discussing.

Critical thinking skills: Problem solving.

Reading skills: Scanning.

EVALUATION OF CONTENT

Students should actively participate in the discussions.

Conference		Objective	Participating countries
Rio Summit	Rio de Janeiro, Brazil, 1992	<ul style="list-style-type: none"> Existing environmental problems are acknowledged and short, medium and long term solutions are proposed. Focus on climate change and biodiversity. Sustainable development is acknowledged as a solution to poverty and environmental deterioration. In Agenda 21, environmental problems are brought up and their possible solutions for Latin America and the Caribbean. 	172
Kyoto Protocol	Kyoto, Japan, 1997 (Map 5.5)	<ul style="list-style-type: none"> Become a legal instrument against climate change. Reduce the greenhouse gases at least by 5.2%. 	129
Earth Summit in Johannesburg	Johannesburg, South Africa, 2002	<ul style="list-style-type: none"> Renew the political commitment acquired in Rio de Janeiro, through pro-sustainable development programs. 	180
Bali Summit	Bali, Indonesia, 2007	<ul style="list-style-type: none"> Attain agreements in order to stop climate change in the planet. 	130
Copenhagen Climate Change Conference	Copenhagen, Denmark, 2009	<ul style="list-style-type: none"> World decrease of carbon dioxide emission at least by 50% for 2050. 	160
Cancun Climate Change Conference	Cancun, Mexico, 2010	<ul style="list-style-type: none"> Confirm the second period validity of the Kyoto Protocol. 	190

To Learn More

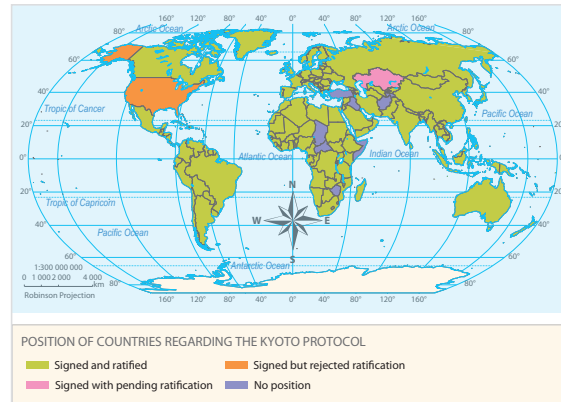
The Kyoto Protocol is an international treaty that is based on the 1992 United Nations Framework Convention on Climate Change (UNFCCC). It commits countries to setting targets to reduce greenhouse gas emissions.

MAP 5.4 Kyoto Protocol.
SOURCE: Atlas Universali y de México, Macmillan-Casillo, 2006.

Apply your knowledge

Answer the following questions by researching in your school library or on the Internet:

- Which are the most important risks regarding climate change in Mexico?
 - What are the consequences of climate change that you have seen where you live?
 - Are the meetings organized by the UNEP important to solving environmental problems, especially climate change?
 - What do you think about Mexico's participation in these international meetings?
 - Would you like to take part in decisions made internationally to solve environmental problems?
- Share your answers with your classmates and discuss them.



123

SESSION INFORMATION

Week: 33

Session: 131

Expected learning outcome: Recognize the participation of Mexico and representative countries in environmental care and sustainable development.

CONTENT DELIVERY

Start: Ask students the following questions:

What is sustainable development?

Which is the most important protocol so far?

What's the objective of such protocol?

Elicit answers in whole class.

Development: Have students answer the section *Apply your knowledge* (They will need access to the library or Internet).

Closing: Elicit answers.

SKILLS DEVELOPMENT

Critical thinking skills: Doing research.

Reading skills: Scanning, reading for detail.

Interpersonal skills: Discussing.

EVALUATION OF CONTENT

Students should actively participate in the research.

SESSION INFORMATION

Week: 33

Session: 132

Expected learning outcome: Recognize the participation of Mexico and representative countries in environmental care and sustainable development.

CONTENT DELIVERY

Start: Remind students of agreements they mentioned in the end of the previous session regarding sustainable development.

Development: They should read page 124 and check if what they mentioned is included in the list of world agreements so far. Elicit answers.

Closing: Students should have a round table the following class. It is described on page 125, in the section *Apply your knowledge*.

Main International Agreements for the Care of the Environment around the World

It wasn't until the Rio Summit that agreements and measures were established to solve the environmental problem; they are described in the following chart.

CHART 5.2 International agreements for environmental care.

Conference	Agreements
On human development	<ul style="list-style-type: none">To include the environmental problem in the international agenda and carry out other conferences to find a solution.
Tbilisi, Environmental education	<ul style="list-style-type: none">To include environmental education in their formal and informal educational programs.To invite the education authorities to intensify their reflective, research and innovation work on environmental education.
Nairobi Declaration	<ul style="list-style-type: none">The Nairobi Declaration and the Environmental Action Plan. In the first one environmental problems are highlighted, in the second one, there are strategies and stages to tackle these problems.
Rio Summit	<ul style="list-style-type: none">The Rio Declaration about environment and development; Agenda 21; Statement of Principles on Forests; the United Nations Framework Convention on Climate Change, and the Convention on Biological Diversity.
Kyoto Protocol	<ul style="list-style-type: none">To reduce emission of some greenhouse gases responsible for global warming. The total emission from developed countries must be reduced during the period from 2008 to 2012 at least by 5% in relation to the 1990 levels.To decrease polluting gases such as: carbon dioxide, methane, nitrous oxide, hydro fluorocarbons and sulfur hexafluoride.
Earth Summit in Johannesburg	<ul style="list-style-type: none">To continue with the efforts to promote sustainable development.To improve the living conditions of people living in poverty and revert environmental deterioration.
Bali Summit	<ul style="list-style-type: none">No resolutions were agreed upon, but it was finally accepted that:<ol style="list-style-type: none">Global warming is a fact.It is necessary to reduce and negotiate the emission of greenhouse gases.Adequate measures must be taken in every country to prove and measure their emissions. <p>For the first time, all the participating countries accepted the three previous points.</p>
Copenhagen Climate Change Conference	<ul style="list-style-type: none">The creation of an international fund to reduce the emission of polluting gases, deforestation and forest degradation.
Cancun Climate Change Conference	<ul style="list-style-type: none">To postpone the second period of validity of the Kyoto Protocol.The document approved in Cancun states the need to reduce the emission of carbon dioxide by 25%-40% by 2020, compared to the levels in 1990, and it leaves this process under the UN's control.The agreement must be detailed in the next conference that will take place in 2011 in the South African city of Durban.

124

Kells

SKILLS DEVELOPMENT

Critical thinking skills: Comparing and contrasting, remembering.

EVALUATION OF CONTENT

Students should be able to name solutions that were mentioned the previous session; students should actively participate to name similarities and differences they can find in the text.

Apply your knowledge

Work in teams of four or five and organize a group conference about environmental problems at school following these instructions:

1. Think about an obvious environmental problem at your school, for example: control of solid waste; separation of organic and inorganic waste; proper use of water and electric energy; lack of green areas, plague control; better use of paper, among others.
2. Choose a team to organize a conference, with a president, a secretary and two mediators.
3. As homework, research the problem you chose in class and make suggestions to control and solve it.
4. In class, talk about your suggestions with your team and establish solutions.
5. Start the conference, each team will have enough time to present their solutions and talk about the others.
6. Reach conclusions and make agreements with the class.

Answer the following questions:

- a) Was it difficult to reach agreements? Why?
- b) Is it important to have meetings to solve the problems we face in society? Why?

Laws and Actions for the Care for the Environment and Sustainable Development in Mexico

Mexico participates and organizes different international activities related to the environment, especially related to climate change. Some of the activities are focused on the knowledge of the subject, its causes and consequences; others, are focused on the design and analysis of policies that seek to reduce the problem or adapt to it.

Regarding the laws in our country, environmental **legislation** for the care of the environment and natural resources is included in the Political Constitution of the United Mexican States.

In article 3 of the constitution, it is established that one of the aspects of basic education is to teach new generations about the use of natural resources. Article 4 says that every person has the right to a proper environment for their development and well-being. Article 25 establishes

the State's obligation to encourage the preservation and protection of the environment from public and private enterprises. Additionally, article 27 states that the Nation owns all of the natural resources in our territory.

These articles are essential to environmental matters. Even though they are not the only ones, they provide the legal basis to establish concrete and specific laws about the care, preservation, use and planning of natural resources and the environment. We refer to the General Law of Ecological Balance and Environmental Protection (known by its Spanish acronym LGEEPA).

The LGEEPA establishes the measure for the preservation and restoration of ecological balance, as well as environmental protection within the Mexican territory (Fig. 5.3). These dispositions focus on giving and strengthening sustainable development. The LGEEPA also defines environmental crimes and measures to control pollution.

Curious Fact

The *Hoy no circula* program (No driving today) in Mexico City is intended to reduce atmospheric pollution and improve the quality of air; it was established in 1989. The program consists of reducing the number of vehicles on the road every day, therefore decreasing the production of pollutants. It has changed throughout the years, nowadays a vehicle can be used every day if it is proven that it does not pollute.

GLOSSARY

Legislation. Having the power to make laws.

How much did I learn?

In the next activity you will become aware of the participation of Mexico and the representative countries in the care of the environment and sustainable development.

Write a one-page long report about Mexico's participation in the international conferences.

1. What international agreements and documents about the environment has the Mexican government signed?
2. What is the importance, from a political point of view, of participating in international conferences?
3. What environmental laws in our country benefit or harm you?
4. What is your opinion about environmental laws in the country, your state or city?



FIG. 5.3 The LGEEPA was published in 1968.

SESSION INFORMATION

Week: 34

Session: 133

Expected learning outcome: Recognize the participation of Mexico and representative countries in environmental care and sustainable development.

CONTENT DELIVERY

Start: Set the classroom chairs in round table (or tables). Students will hold the discussion described in the section *Apply your knowledge* on top of the page. Choose a facilitator who is going to take the time for everyone's participation and should not allow disrespect at any moment. If it happened, he should report it immediately. Have them lead the discussion for not more than 10 minutes.

Development: Students should read the section *Laws and Actions for the Environment Care and Sustainable Development in Mexico*.

Closing: Students should write the report, which is explained in the section *How much did I learn?* For homework.

125

SKILLS DEVELOPMENT

Interpersonal skills: Discussing, debating.

Humanistic skills: Group interaction.

EVALUATION OF CONTENT

Students should actively participate in the round table.

SESSION INFORMATION

Week: 34

Session: 134

Expected learning outcome: Appreciate the importance of Protected Natural Areas, environmental services and clean technologies around the world and in Mexico.

CONTENT DELIVERY

Start: Ask students to hand in the homework report. Then, students will ask and answer the questions in the section *How much do you know?* Elicit answers.

Development: Students should read pages 126 to 128. Ask them comprehension-check questions using the maps on pages 126 and 127.

Closing: Students should do research and give presentations during the following two sessions. The research and presentation description is on page 128; in the section *Apply your knowledge*. It is important that they keep their research because they will use it later again.

→ Expected Learning

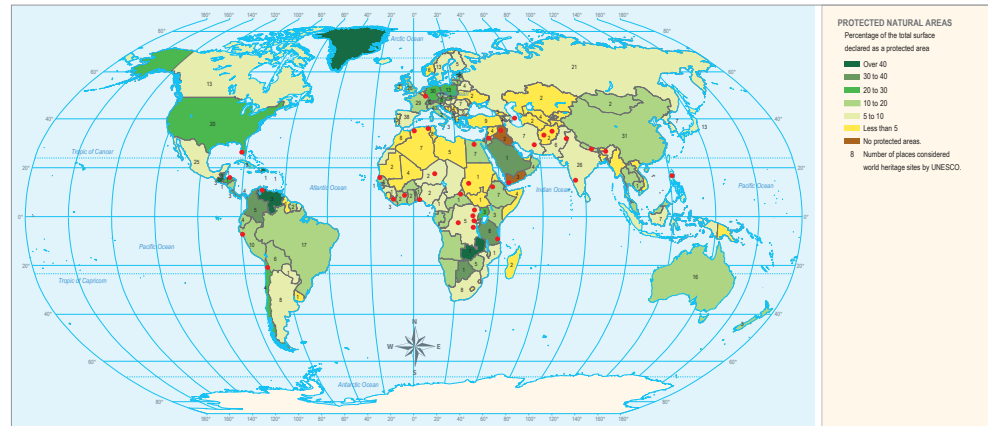
Appreciate the importance of Protected Natural Areas, environmental services and clean technologies around the world and in Mexico.

Protected Natural Areas around the World and in Mexico

How much do you know?

Look at map 5.5 and talk with your classmates about the following questions:

1. Do you know the term Protected Natural Areas or National Parks? Explain what you know about the subject.
2. Do you know any natural reserves? Talk about some of them.
3. Do you remember what sustainable development is? What measures can you carry out to achieve it at home and in school?
4. Does the generation of electric energy pollute? Does this fact help achieve sustainable development?
5. What are clean or alternative technologies? Do alternative technologies help achieve sustainable development?



MAP 5.5 The PNA of the world.
SOURCE: Atlas Universally de México, Macmillan-Castillo, 2006.

For about a hundred years mankind has thought about the preservation of natural beauty. In modern times the first natural reserve of great magnitude was Yellowstone National Park, in the United States, created by decree in 1872. Generally, Protected Natural Areas (PNA) are established by

governmental institutions (Map 5.5). A common characteristic the PNA share is the protection and preservation of their ecosystems. The United States, countries from the European Union, New Zealand, Australia, and Russia are countries that have several natural reserves.

Kells

126

SKILLS DEVELOPMENT

Visual/Spatial skills: Locating data.

Interpersonal skills: Leading and organizing presentations.

EVALUATION OF CONTENT

Students should be able to identify data you mention.

Mexico has an important number of PNA because it is a mega-diverse country. The General Law of Ecological Balance and Environmental Protection (known by its Spanish acronym LGEEPA) establishes the goals, the definition, classification and internal activities of the PNA. PNAs are ecosystems that have had no important alterations of their elements by people. The LGEEPA establishes the objectives through which they are selected and promoted:

1. To preserve the natural environments representative of the different

biogeographic and ecological regions of the most fragile ecosystems of the country.

2. To safeguard the genetic diversity of wild species that the evolution of living beings depends on.
3. To secure the sustainable use of the ecosystems.

PNA classifications are: national parks, natural monuments, natural resources protected areas, flora and fauna protected areas, sanctuaries, and biosphere reserves (Map 5.6).



MAP 5.6 Biosphere reserve
SOURCE: *Geografía de México y el mundo*, Esfinge, 2012, p. 233.

SESSION INFORMATION

Week: 34

Session: 135

Expected learning outcome: Appreciate the importance of Protected Natural Areas, environmental services and clean technologies around the world and in Mexico.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

It is important that they keep their research because they will use it later again.

127

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

SESSION INFORMATION

Week: 34

Session: 136

Expected learning outcome: Appreciate the importance of Protected Natural Areas, environmental services and clean technologies around the world and in Mexico.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

It is important that they keep their research because they will use it later again.

These represent one or more ecosystems that have not been greatly altered, and house characteristic species of the country's biodiversity.

The Montes Azules Reserve, Chiapas' biosphere.



In the center of the reserve only scientific and environmental education research activities can be carried out. In the buffer zones, non-damaging economic activities are allowed.

These are important national bio-geographical representations due to their scenic beauty and educational value, recreational, historical, etc.



Activities related to research, recreation, tourism and environmental education can be carried out, without damaging the ecosystem.

Areas containing one or several natural elements, that due to their aesthetic, historical or scientific value, are included in the PNA.

Bonampak, Chiapas.



Only activities related to their preservation, scientific research, recreation and education are allowed.

These are destined to the projection and preservation of the soil, hydrographic basins, and in general, the natural resources located in the area.

Hydrographic basin of the Necaxa River, Puebla.



Activities related to the sustainable use of natural resources can be carried out, such as: research, recreation, tourism and environmental education.

These are places containing habitats, whose balance and preservation depend on the existence of species of flora and fauna from the region.

Teporingo, biological corridor Chichinautzin, Estado de Mexico.



The activities allowed must be related to the preservation, shelter, research and sustainable use of the species, as well as environmental education.

These are areas characterized by their great wealth of flora and fauna, and the presence of species of restricted distribution.

Beach at Puerto Arista, Chiapas.



Only research, recreation and environmental education activities are allowed, they must be compatible with the area's characteristics.

CHART 5.3 PNA shows their characteristics, according to the LGEEPAs guidelines.

Apply your knowledge

Work in groups of three members and carry out the following research.

1. Choose one PNA in your state or a neighboring state and research the following:
2. Kind of PNA, location, when and why it was established as a PNA, its general physical characteristics (vegetation, fauna, weather, hydrology, kind of topography), which activities are carried out and their functionality.
3. Share your research information with your classmates.
4. Choose the best research and make a bulletin board with the chosen PNA.

Kells

128

SKILLS DEVELOPMENT

Reading skills: Scanning, reading for detail.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Environmental Services and Clean Technologies for the Care of the Environment around the World and in Mexico

One of the proposals suggested in the Kyoto Protocol is the one about environmental services. These are generated by their own ecosystems and represent the support nature provides, either to decrease or to revert the amount of pollutants we generate. This way, environmental services are a feasible option to achieve sustainable development.

Carbon capture is carried out, in a natural way, by plants. Through **biomass**, forests and jungles keep the captured carbon within their tissues, otherwise they would be in the atmosphere, contributing to global warming. The abundance of vegetation favors this process, especially in tropical forests, due to the amount and size of the tree leaves, bushes and herbs.

The carbon plants capture also favors ecosystems, while forming soil rich in this mineral, making them fertile for agriculture and to sustain natural vegetation.

Hydrological services refers basically to the capture of water, thanks to the rain or infiltration, and to the preservation of its quality. Soil erosion and deforestation decrease the possibilities of infiltration, that is why forests are so important in helping to decrease or stop deterioration. While preserving natural areas and, especially, forests, habitats of flora and fauna prevail. On the other hand, trees participate in the definition of weather characteristics, they mainly help avoid great oscillations in temperatures, that is to say, the minimal and the maximum registered in one day.

A delegation of some countries and non-governmental organizations has proposed, through the UNEP, several projects about environmental services such as "a tree for every inhabitant of the planet"; in Mexico there are reforestation projects for forests and projects to increase and keep green areas in the cities. Some reforestation and preservation projects are carried out in indigenous regions. In addition to the legislation to reduce carbon dioxide emissions (by industries and cars), the policies are meant to preserve their forests, jungles and arid regions, since 25% of their surface are potential drains.

The countries of the European Union are pioneers in setting in motion projects for environmental services; they are even building industries to capture carbon dioxide from the atmosphere. There are also projects in which some environmental services are economically rewarded by national or international programs.

Clean (Fig. 5.4) or alternate technologies are other measures taken to solve the environmental problem since they prevent the burning of hydrocarbons, oil and gas. The most developed and implemented clean technologies in central countries are: wind, solar, geothermic and tidal energy.

Enhanced **geothermal energy** allows the production of electricity through steam turbines. In Mexico there are several geothermal plants. Los Azúfres, in the state of Michoacán, is the most productive, with a total of 25,000 kilowatts (Fig. 5.5), which corresponds to almost the total consumption of electric energy of the city of Morelia.

Wind energy, also known as eolian, is transformed into electric energy. It is an endless and non-polluting source of energy, but irregular, so it has to be stored in batteries. In Mexico, since 1994, the Comisión Federal de Electricidad (CFE) has an eolian plant located in the state of Oaxaca, that generates 6,570 megawatts for the national network. Electric energy obtained this way is concentrated in the European countries of Spain, Germany and Holland.

Solar energy comes from the Sun, and we get it as light and heat. It is stored in cells to provide energy at night, either as electricity or as heat. In Mexico this new technology is used since 1993 in some parts of the country, the National Institute of Ecology estimates that over 8,000 megawatts are generated every year.

When water from the oceans is set in motion, either by waves or tides, the force it produces can generate electric energy thanks to tidal energy centrals. The amount of energy obtained from a wave depends on the location and the time when the movement happens.

Look at map 5.8 which shows developed countries where more clean energy is created. Even though the levels of production are still low, the path is set to move towards clean technologies.

Curious Fact

Mexico's first PNA was the one in Desierto de los Leones, it was designated as such during Porfirio Díaz's government in 1876.

GLOSSARY

Biomass. Organic matter created during a spontaneous biological process, it can be used as an energy source.

Geothermal energy. Heat from the inside of the Earth.

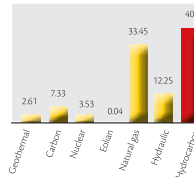


FIG. 5.4 In Mexico the generation of energy with clean technology is in its early stages.



FIG. 5.5 Los Azúfres is located in the cross-sectional volcanic axis

SESSION INFORMATION

Week: 35

Session: 137

Expected learning outcome: Appreciate the importance of Protected Natural Areas, environmental services and clean technologies around the world and in Mexico.

CONTENT DELIVERY

Start: Ask students to scan the entire page and find the types of energy, which are generated in Mexico. Elicit answers (They are on the extreme right).

Development: Students should read the entire page carefully. They will mind map the types of energy and clean technologies.

Closing: Check students' mind maps.

Homework: Students will do the activities described in the section *Apply your knowledge* on page 130.

129

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Mind mapping.

EVALUATION OF CONTENT

Check students' mind maps.

SESSION INFORMATION

Week: 35

Session: 138

Expected learning outcome: Appreciate the importance of Protected Natural Areas, environmental services and clean technologies around the world and in Mexico.

CONTENT DELIVERY

Start: Students should present the project they should have done about environmental services to carry out in their community.

Development: Ask students to read the section *Importance of Protected Natural Areas, Environmental Services and Clean Technologies in Mexico*. Ask comprehension-check questions like: Which development strategies do environmental services require? Who or what usually implements environmental services programs? What did the federal government establish to help environmental preservation?

Closing: Students should do the analysis explained in the section *How much did I learn?* In which they will be using the information they got from their two previous research homework papers. If there's time, it can be done in class or assigned for homework.

To Learn More

Despite the fact that clean technologies, especially alternative energies, are underdeveloped in our country and that until now produce little energy, they are a fundamental alternative for the necessary decrease in the emission of greenhouse gases. Even the amount of pollutants is insignificant if we compare it to the one produced by hydrocarbons.

Apply your knowledge

Work in teams of four.

1. Work on a school project about environmental services to carry out in your community.
2. We propose you strengthen the green areas if you live in an urban area or reforest the natural areas, if you live in a rural area.
3. Plan the following: a) where you will get the species, school cooperation or some governmental institution; b) define the appropriate species according to the place you live; c) the exact place or places that you will reforest or increase the green areas; d) when you will carry it out, and e) who will participate in each activity.
4. If it is not possible to carry out the previous activity, you can look after green areas or natural vegetation at your school or around it. If you plant something, you have to take care of it.
5. Take pictures of the process, make a bulletin board showing them and display it at your school.

Importance of Protected Natural Areas, Environmental Services and Clean Technologies in Mexico

It is clear that we need to exploit resources in order to continue our existence and social development, that is why Protected Natural Areas are a good instrument to differentiate between what is fundamental to preserve and what can be used through planning and governmental control.

Environmental services suggest several development strategies. On the one hand, establish concrete alternatives for the solution of environmental

problems without continuing with the deterioration of ecosystems and taking advantage of the ecologic characteristics of every one of its elements, especially the forests. On the other hand it can become a source of income, especially from rural regions of less developed countries, by receiving payments for their environmental services. Whether for programs implemented by the government or those offered by developed countries, such as the United States and the European Union.

In Mexico the federal government established a program to help the forestry sector that uses just one incentive plan for the owners of the lands to carry out actions to protect, preserve, restore and make the most of, in a sustainable way, resources of forests, jungles and arid zones in Mexico.

How much did I learn?

Work in teams of three, preferably from the two previous teams, and analyze the following activity.

1. Read the work you did for the Protected Natural Area of your state and explain the importance it has for your local community and for you.
2. From the activity that you carried out about reforesting or increasing green areas, explain the importance and the benefits it can give to your community in the medium or long term.
3. Talk about your answers with the class.

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SKILLS DEVELOPMENT

Interpersonal skills: Giving presentations.

Reading skills: Scanning, reading for detail.

Critical thinking skills: Remembering, synthesizing.

EVALUATION OF CONTENT

Students should be able to integrate information to give conclusions.

Geologic, Hydro-Meteorological, Chemical and Sanitary Risks, Around the World and in Mexico

How much do you know?

Work in pairs and carry out the following activity:

- Write a report about a recent natural disaster in your area or any other part of the world. Take into account: the kind of phenomenon, the date and place, the intensity of the phenomenon, the human and economic consequences. It is not necessary to read any text, just use your memory.
- Read some of the reports to the rest of the class and talk about the following points:
 - Why the natural phenomenon became a disaster.
 - Which factors, according to you, led to a disaster.
 - How prevention can help lower the consequences of a disaster.

Natural disasters happen in different parts of the world and the regions are at risk for development. A risk refers to the probability of a certain natural phenomenon, occurring with a certain intensity and duration, with negative consequences for the population, and becoming a disaster. The risks are, almost always, associated with the elements and

the planet's dynamics, such as: cyclones, flooding, earthquakes, and droughts, among others (Map 5.8). There are other kinds of risks, the ones caused by man, the ones that can be caused by economic and social activities, such as: leaks or spills of dangerous chemical or nuclear substances, plagues, intoxications, etc.



→ Expected Learning

Identify the main risks and vulnerability of the population around the world and in Mexico.

SESSION INFORMATION

Week: 35

Session: 139

Expected learning outcome: Identify the main risks and vulnerability of the population around the world and in Mexico.

CONTENT DELIVERY

Start: Students should work in teams to answer the section *How much do you know?* On page 131. Elicit answers.

Development: Students should analyze the map on the page. In pairs, they should ask each other where each natural phenomenon usually occurs.

Closing: Ask students to close their books. Tell them to list the natural phenomena they remember. Later, ask them to write where those phenomena occur.

Presentations preparation: Organize four teams. Each team will present one of the types of risks explained on pages 132 and 133. They should explain the information in the book and should prepare images that illustrate the risks.

131

SKILLS DEVELOPMENT

Interpersonal skills: Discussing.

Visual/Spatial skills: Locating places.

Critical thinking skills: Remembering.

EVALUATION OF CONTENT

Students should be able to list at least five phenomena and their common location.

SESSION INFORMATION

Week: 35

Session: 140

Expected learning outcome: Identify the main risks and vulnerability of the population around the world and in Mexico.

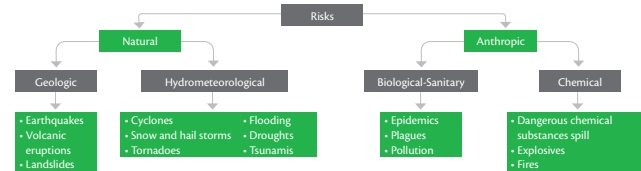
CONTENT DELIVERY



Start: Have students look at the synoptic table on top of page 132. Elicit information in the table.

Development: Each team should present the information on each kind of risk, using visuals that they were told to prepare the previous session.

Closing: Students should make comprehension-check questions and once they finish, they should self-evaluate their work.

In the following flow chart, the most common risks are classified, read it carefully. Some natural risks in our country are shown on map 5.10; carefully examine their location.



Natural risks Caused by the dynamics of the nature's elements	Anthropic risks Caused by the man's activity
<p>Geological risks related to the dynamics of Earth's crust</p> <p>Earthquakes: are linked to the limits of tectonic plates and volcanic activity, the intensity is related to the kind of tectonic movements. (Fig. 5.6).</p> <p>FIG. 5.6 Environmental degradation due to the earthquake in Japan in March 2011.</p> 	<p>Biological-Sanitary risks: health risks caused by exposure to bacteria, virus and fungi</p> <p>Epidemics: when a disease affects a higher number of individuals than expected in a determined time.</p>
<p>Volcanic eruptions: expulsion of burning rocks, the intensity of this phenomenon depends on the explosiveness, the amount and time of the eruption. They are linked to the limits of the tectonic plates.</p>  <p>FIG. 5.7 Volcanic eruption.</p>	<p>Plagues: animals that damage crops, cause economical damages for the producers, sometimes they are related to environmental deterioration.</p>
<p>Landslides: caused by tectonic movements or the fragility of rocks due to erosive events; rocks, soil, houses and trees are detached and create a flow of mixed material. The difference between an avalanche is that, the latter is a mix of all the previous with ice and snow (Fig. 5.8).</p>  <p>FIG. 5.8 A buried village, Juan de Crijalva, Chiapas.</p>	<p>Pollution: the presence of foreign and damaging elements to the environment, it can cause health problems for all living beings.</p>

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SKILLS DEVELOPMENT

Interpersonal skills: Teaching others.

Metacognitive skills: Self-monitoring, self-evaluating.

Critical thinking skills: Formulating questions.

EVALUATION OF CONTENT

Students should actively participate in the presentations.

SESSION INFORMATION

Week: 36

Session: 141

Expected learning outcome: Identify the main risks and vulnerability of the population around the world and in Mexico.

CONTENT DELIVERY

Start: Have students look at the synoptic table on top of page 132. Elicit information in the table.

Development: Each team should present the information on each kind of risk, using visuals that they were told to prepare two sessions ago.

Closing: Students should make comprehension-check questions and once they finish, they should self-evaluate their work.

Homework: Students need a device with Internet access.

Hydrometeorological risks: created by the combined action of atmospheric and hydrologic elements	Chemical risks: caused by uncontrolled exposure to chemical agents
<p>Cyclones: low pressure areas are created, evaporating great amounts of water from the oceans, which move towards the continents. They are created between 0° and 30° degrees North and South latitude in the Pacific and the Indian Oceans, in Asia and Australia, the Atlantic and the North Pacific Oceans in America.</p> <p>Snow and hail storms: a storm which produces great amounts of hail or snow, damaging the area where it falls.</p>	<p>Dangerous chemical substances spills: are generally caused by human neglect when these substances are not properly handled. Oil spills are included in this kind of risk.</p> <p>Explosions: the danger of explosion comes when flammable material is mixed with air, creating an explosive mix. This can occur when these flammable materials are stored, transported, in process or in production.</p> <p>Fires: fires are disasters than can cause grave harm to living beings, not only through burns, but smoke inhalation can also cause great damage. Forest fires can also spread in big areas.</p>
<p>Tornadoes: are violent air currents that cause great damage to the regions they go through.</p>	<div> </div> <div> <p>FIG. 5.9 Epicenter, on the coast of Honshu.</p> </div>
<p>Flooding: occurs because of an accumulation of rain or the overflowing of rivers that receive great amounts of water.</p>	
<p>Drought: a lasting phenomenon, caused by dry weather conditions and scarce or inexistent precipitation. It causes greater disasters in regions with dry and semi-dry weather.</p>	
<p>Tsunami: a giant wave of water, formed by seismic movement of the oceanic crust, it hits the coasts of a continent and can cause great damage (Fig. 5.8).</p>	

Apply your knowledge

Carefully examine the maps about risks around the world and in Mexico, as well as the seismological and the volcanic maps of the world. Answer the following questions:

1. What kind of plate limits do regions with a higher risk of earthquakes and volcanic eruptions in the world coincide? Explain why.
2. Mention regions with higher volcanic and seismic risk in the world and in Mexico.
3. Make a list of the countries with a higher risk of cyclones.
4. Mention regions in Mexico with a higher possibility of desertification.
5. Make a list of countries where there is a risk of tornadoes.

133

SKILLS DEVELOPMENT

Interpersonal skills: Teaching others.

Metacognitive skills: Self-monitoring, self-evaluating.

Critical thinking skills: Formulating questions.

EVALUATION OF CONTENT

Students should actively participate in the presentations.

SESSION INFORMATION

Week: 36

Session: 142

Expected learning outcome: Identify the main risks and vulnerability of the population around the world and in Mexico.

CONTENT DELIVERY

Start: Ask students if they remember the last disaster in Mexico. Was it an earthquake? A flood? Elicit in whole class.

Development: Students should read pages 134 and top of page 135. Ask them comprehension-check questions.

Closing: Students should prepare an earthquake emergency plan for school. They should define the way out, who they can call and where they should gather (safety area). Elicit answers. In case there is enough time, they might do the project described in the section *Apply your knowledge* on page 135.

Homework: Students will need a device with Internet access.



FIG. 5.10 The disaster from Japan's earthquake caused the destruction of houses and pollution.



FIG. 5.11 The new village of Juan de Grijalva in Chiapas was rebuilt without taking into account the way of life of its inhabitants.

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MAP 5.8 Risk areas in Mexico.
SOURCE: Atlas Universal y de México, Efringe, 2005.



Relationship between Environmental Biodegradation and Recent Disasters around the World and in Mexico

All natural disasters deteriorate man's environmental surroundings and the quality of renewable natural resources available.

After a natural disaster, earthquake, landslide, flooding, etc., there is environmental deterioration, because there is destruction of houses, appearance of insects, plagues, diseases and many collateral factors that affect their habitat.

When a city is the center of the disaster, its economic productivity declines and traffic and pollution problems increase.

In rural regions, some examples of environmental degradation are: the destruction and deterioration of houses and farmlands, the impact of geological processes in the shaping of an area where man settles.

As an example of these disasters is the earthquake and tsunami in Japan on March 11th, 2011. The seismic movement was 9.0 on the Richter scale (Fig. 5.10). The epicenter was registered in the sea near the Northern coast. The

earthquake was caused by the movement of the subduction zone between the Eurasian and the Pacific plates. After the earthquake a tsunami alert was issued for the Pacific coast of several countries. A five meter high wave was created which hit the Northern coast of Japan.

The effects: Japan confirmed the death of 9,523 people, a refinery was burned in Tokyo, 1,800 houses were destroyed, three nuclear centers were shut down, the transportation network suffered considerable damage, the tsunami flooded the Sandai airport and operations were suspended, over 1.5 million homes had no water supply. According to the International Monetary Fund (IMF), the damage caused by the catastrophe was between 3% and 5% of Japan's GDP. As mentioned, the degradation of urban environments is focused, basically, on the destruction of infrastructure that supports life in the cities.

Due to the heavy rains of November 15, 2007, there was a landslide that caused flooding in Chiapas and Tabasco. The landslide caused 300 casualties and the destruction of at least 100 houses in Juan de Grijalva, Chiapas. Authorities decided that the land couldn't be used for rebuilding as it was in a high risk zone, so Juan de Grijalva was rebuilt in the same municipal capital, Ostauacán, as a "rural city" (Fig. 5.11).

SKILLS DEVELOPMENT

Critical thinking skills: Problem solving.

EVALUATION OF CONTENT

Students should actively participate in the emergency plan elaboration.

The population faced degradation of their space, as well as the disappearance of their farmlands, livestock and place to live, and as a result, their way of life. They were offered houses with all the services a city has, under a sustainable city regime, but after several years, the population was dissatisfied that the houses in the residential unit did not correspond to their lifestyle and their

economic activities and they have not been able to recover.

The population growth, economic and social activities that settle us in a place, the lack of opportunities, among other factors, lead us to stay in places that can harm our economic activities, the environment, and, in general, our everyday activities (Fig. 5.12).

FIG. 5.12 The neighborhood San Juan Ixhuatepec is build on a hillside.



Apply your knowledge

Form teams of three or four and carry out the following research:

1. Research written documents or on the Internet, but also interview the adult population of your community or city, about what natural disasters have happened in the last 20 years.
2. Draw a chart where you write every phenomenon, the kind of risk they represent according to the classification we studied; when did they happen (at least the year).
3. Based on what you researched, in documented sources and field work, explain which was the environmental degradation that happened to the community where each of the natural disasters occurred.
4. How do we avoid them? How do we prevent them from happening again?

Vulnerability of the Population around the World and Mexico

Vulnerability refers to the fact that we are exposed to be hurt physically or morally, in this case, by a natural risk. The population's vulnerability is influenced by the following factors.

1. Where we live in regards to the ecosystems' natural dynamics, such as: flooding, earthquakes, volcanic activity, landslides, snowfalls, hurricanes, etc.
2. Precarious buildings without good ground or foundations, with unsuitable materials for the zone that do not have the proper resistance. Such was the case of Haiti, where a high percentage of the buildings fell in Port-au-Prince.

3. Economic conditions that do not fulfill human needs. Unemployment, underemployment, hence, the lack of income, shortage of goods, education, low natural resources, segregation, concentration of property, etc.

4. No civil protection programs that help us act before, during and after the natural phenomenon, from home, school as well as in governmental institutions.

The location of human activities has to do with people and their socio-economic, political and cultural organization, therefore, there are disasters that do not depend only on nature, but also on the decisions we make or we are forced to make in order to settle in a certain space. This depends on our economic, social, cultural and political position.

How much did I learn?

In the following activity you will relate the population's main risks and vulnerabilities.

In your notebook draw a chart where you establish the kind of risk, environmental degradation and vulnerability factors that influenced the 2011 earthquake and tsunami in Japan, the landslide in San Juan Grijalva and one of the disasters that happened in your community. Use the following chart:

Natural Disaster	Kind of risk	Environmental degradation	Vulnerability factors that influenced
Japan	Earthquake and Tsunami	Destruction of infrastructure	Geographical location
Juan de Grijalva	Landslide	Destruction of houses and land.	Geographical location
Your community	Students' own answers	Students' own answers	Students' own answers



FIG. 5.13 Cathedral of Port-au-Prince, Haiti, after the earthquake.

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SESSION INFORMATION

Week: 36

Session: 143

Expected learning outcome: Identify the main risks and vulnerability of the population around the world and in Mexico.

CONTENT DELIVERY

Start: Ask students for the meaning of vulnerability. Elicit answers.

Development: Students should read the section *Vulnerability of the Population around the World and Mexico*. Students should look up terms they do not understand.

Closing: Students will answer the activity in the section *How much did I learn?* Using the device with Internet access that they were asked to take to the session. Elicit answers.

SKILLS DEVELOPMENT

Critical thinking skills: Defining concepts, applying knowledge.

EVALUATION OF CONTENT

Check students' tables.

SESSION INFORMATION

Week: 36

Session: 144

Expected learning outcome: Recognize the importance of the participation of governments and society in the prevention of disasters around the world and in Mexico.

CONTENT DELIVERY

Start: Organize four groups. They should ask and answer the questions in the section *How much do you know?* Elicit answers.

Development: Each team should read a segment on page 136 or top of page 137. Once they finish, reorganize students so in each team there is one person from each segment explaining the segment to the rest of the team members.

Closing: Ask comprehension-check questions to students at random.

Project preparation: Each team will present a segment from the following section, explained on pages 137 and 138. Ask them to prepare visuals (Power Point presentation or poster) and comprehension-check questions.

→ Expected Learning

Recognize the importance of the participation of governments and society in the prevention of disasters around the world and in Mexico.

Participation of Governments and the International and National Institutions towards the Prevention of Disasters

How much do you know?

Talk with your classmates about the following questions.

1. Do you know about an international organization for the prevention of disasters?
2. Is it important for there to be international or governmental organizations for the prevention of disasters? Why?
3. Do you know about an organization in our country created to prevent disaster? Which one or ones?
4. Are there any plans in your school to face natural risks so they do not become disasters? Do you know how they work? Is it important that you know them? Why?

Since the integration of most nations to the world community, the formation of international, as well as local, organizations have surged. They manage the safety and wellbeing of the populations of the gathered countries and the preservation of international rights and peace within them. The most recognized one is the United Nations (UN).

The UN has the UNISDR, whose objectives are the promotion and follow up of the Hyogo Framework for Action (HFA) application. The HFA is a group of guidelines, accepted by 168 countries of the world, for the integration of the Disaster Risk Reduction (DRR) policies on the national and local development plans. The HFA lays out the following priorities:

Priority 1: to make sure the DRR constitutes a national and local priority, along with a solid foundation of institutions that arrange the application of its plans and programs.

Priority 2: to identify, evaluate and watch over disaster risks for the proper operation of early alerts.

Priority 3: to develop and use knowledge, innovations and education to create a culture of safety and resilience.

Priority 4: to reduce present and future risk factors.

Priority 5: to strengthen preparations for times of disaster, to secure

an efficient response to the emergency.

The UNISDR encourages and promotes the creation of alliances with governments and different humanitarian and development groups all over the world. Partner groups that contribute to achieve these objectives include other UN agencies, multilateral organizations, international organizations, regional actors, NGOs, the civil society and the private sector.

With the intention of channeling economic aid, for risk management strategies as well as recovery ones, the UNISDR is helped by the Global Facility for Disaster Reduction and Recovery (GDFRR) formed by 38 countries and 7 international organizations committed to helping developing countries reduce their vulnerability to natural risks and climate changes, always following the HFA's priorities.

In addition to governmental intervention, there is a large group of organizations from civil society that carry out activities at a local and international level to manage the DRR actions. The best examples are the International Red Cross and Red Crescent Society, whose mutual goal is to protect and help victims of armed conflicts, in addition to the important humanitarian work they carry out during and after disasters of different types.

In Mexico, after a natural or anthropic disaster, the Segob (Spanish acronym for Secretary of the Interior), through the National Disaster Prevention Center (known by its Spanish acronym Cenapred Fig. 5.14), is in charge of



FIG. 5.14 Logo of the National Disaster Prevention Center.

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SKILLS DEVELOPMENT

Interpersonal skills: Discussing, teaching others.

EVALUATION OF CONTENT

The comprehension-check questions are a great evaluation tool.

safeguarding the population, its goods and surroundings. The coordination carried out by the Cenapred is among the different government levels, the volunteering, social and private groups, in addition to civil society.

The National Council is the main collegiate entity in the political area for civil protection and determines the action and guidelines for negotiation,

nationally as well as internationally. In other words, among its main functions are the creation of regulations and surveillance of their proper use, to promote the study, research, training and application of technologies for the strengthening of the DRR, as well as determining the kind of cooperation with other countries.

Importance of Preventing Disasters and Facing Current Risks that Affect the Local Environment

The President of the Republic and the heads of the Secretaries, the state Governors, and Mexico City's Mayor, form the National Council, each guard their corresponding sectors and use resources from the Secretaries' programs to deal with vulnerabilities, aid and recovery in case of disaster.

The National Program for Civil Protection responds to the HFA's priorities and involves the government's institutions in the actions, during and after a disaster. Additionally it manages all the political, economic and social actions that go with the civil protection efforts (Chart 5.5).

All of the rules created for the legal coordination of these actions is called General Law of Civil Protection, a document in which the dispositions, measures and actions for the prevention, aid and recovery of the population in case of a disaster are published.

This law also adapts to the action and registration of volunteer groups: the institutions, organizations and associations that have the personnel, the knowledge, the experience and the teams necessary to provide civil protection in an altruistic and committed way.

The Natural Disaster Fund is a financial institution, within the National Civil Protection System, that was created to support the states of the Mexican Republic, as well as the dependences and Public Federal Administration entities, in the recovery from the effects caused by a natural phenomenon, whose magnitude exceeds the financial capacity for a response from the afore mentioned institutions.

In emergencies caused by natural phenomenon, the National Defense Secretary implements the DN-II-E plan (Fig. 5.15) that directs and channels, along with local authorities and civil society, humanitarian aid.



CHART 5.4 Policies for the prevention of disaster

HYOGO FRAMEWORK FOR ACTION	GENERAL LAW OF CIVIL PROTECTION
For the reduction of the risk of disaster to become a national and local priority fitted with a solid institutional foundation for its application.	Develops a regulated and institutional foundation for civil protection. Plans and organizes the intervention in case of disaster. Follows up, evaluates and controls the prevention processes as well as the recovery and restoration processes. Obtains economic support for research, prevention and for the Fund for Natural Disasters.
To identify, evaluate and watch over the risks of disaster and make early alerts more efficient.	Promotes research and generation of awareness about the risk of disaster in different areas. Applies and provides the infrastructure for monitoring risks. To achieve that, it gets help from the National Center for Disaster Prevention, from the National Autonomous University of Mexico.

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SESSION INFORMATION

Week: 37

Session: 145

Expected learning outcome: Recognize the importance of the participation of governments and society in the prevention of disasters around the world and in Mexico.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

SESSION INFORMATION

Week: 37

Session: 146

Expected learning outcome: Recognize the importance of the participation of governments and society in the prevention of disasters around the world and in Mexico.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

HYOGO FRAMEWORK FOR ACTION	GENERAL LAW OF CIVIL PROTECTION
To use the knowledge, innovations and education in the creation of a culture of safety and resilience on all levels of society.	Informs and coordinates the education on all levels of institutional responsibility, including the encouragement of social participation in risk management.
To reduce present and future risk factors.	From the previous points, it strengthens the capacity for risk management to reduce the existing risk, prevents future risks and prepares an efficient response if necessary.
To strengthen the prevention of disasters and secure an efficient response on every level.	As a consequence of all the previous points, it makes a proper response easier when facing a catastrophe, quickly rehabilitates society's conditions of functionality and, in extreme cases, it contributes to the recovery and rebuilding of structural conditions for everyday operation.

Curious Fact

The Disaster Plan was created and applied as of 1966 as a consequence to the overflowing of the Panuco River. It dates back to the same year of its inclusion in National Defense Planning in the "E" annex.



FIG. 5.15 The implementation of the Disaster Plan happens when the magnitude of the phenomenon exceeds the local authority's ability to respond.

Even though geological phenomena are fairly constant, hydro-meteorological ones, those related to weather, have increased in magnitude and frequency all over the world, affecting local economies and everyday operation of society's components.

Mexico is no stranger to suffering the battering of hurricanes, storms, earthquakes, mudslides, volcanic eruptions, forest fires, and droughts, among others; it is also subject to socioeconomic dynamics that increase the exposure to risk.

The absence of territorial legislation, environmental management and regulating networks for the application of technologies constitutes the risk

triggers, at the same time that they worsen the effects of the disasters.

In a society, it is important to reach agreements that help face an eventuality in an orderly fashion, with the priority of saving lives and citizens' properties. That is why it is important to know the laws that regulate and guide the government's activities, the supporting institutions and civil society in case of risk and disaster. It is also important to know how to handle insecure conditions in order to avoid human casualties and material losses.

In an emergency situation, helping the population is the main function of civil protection and it is only achieved with a joint and ordered action (Fig. 5.15).

How much did I learn?

In the following activity you will recognize the importance of the participation of governments and society in the prevention of disasters.

1. Write the main threats to security that your community faces.
2. Along with your teacher and classmates, determine which organizations can help your community in case of a disaster.
3. Write the role that information plays to avoid panic and promote an ordered response from society when facing a disaster. If you know about a case of disaster, talk about it with your classmates.
4. Write about the importance of the DRR around the world and in the country.

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SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Basic Actions to Prevent Disasters According to the Kind of Risks that Affect a Local Environment

How much do you know?

With the rest of the class, remember and think about the subject of prevention of disasters, talk about the following questions.

1. How many and what natural risks have you faced in your life?
2. What are the natural risks that happen more often in the place where you live?
3. What are the actions that must be carried out for the prevention of disasters due to the natural risks they face? Mention them.
4. Do you have plans or disaster prevention projects in school and at home? Explain what they are.

Mexico has a great diversity of natural elements in its territory, which increases the changes of risks due to natural phenomenon. In general, disasters produce lasting effects and cause an unfortunate number casualties, both human and material. In addition to emotional and environmental deterioration, disasters could mean a set-back in achieving sustainable development. Prevention is fundamental to resisting disasters. In other words, the measures and actions prepared previously to reduce the effects on the population.

When there are prevention actions, a community's capacity to face risks and minimize the disaster's damage increases. The lower the capacity, the higher the vulnerability will be. Action planning requires considering the three moments of the event: before, during and after. In the chart 5.6 we mention the three moments in some disaster prevention actions for the most common kinds of risks in our country.

→ Expected Learning

Recognize the basic actions for preventing disasters in a local environment.

CHART 5.5 Preventive actions and different kinds of risks.

Kind of risk.	Preventive actions		
	Before	During an earthquake	After an earthquake
Earthquakes.	<p>Go to the closest Civil Protection center and get information about:</p> <ol style="list-style-type: none"> a) Whether the area is affected by strong earthquakes. b) The protection measures for home, the work place and school. c) How to collaborate with the rescue brigades. d) Have a battery-powered radio, flashlight and personal documents at hand. e) Establish a meeting point with your family; this point must be the same for all kinds of risks. 	<ol style="list-style-type: none"> a) Keep calm and go to the safety zones, stay where you are. b) Stand under a door frame or on a load bearing wall. c) Stay away from windows, mirrors and glass objects. d) Keep away from heavy furniture, stoves or any hot surface. <ul style="list-style-type: none"> Close the gas valves. e) If you are inside a building, stay where you are, do not use the stairs or the elevator. f) If you are inside a vehicle, drive calmly towards a place far from bridges and electric cables. g) If you are in a public place do not run, scream or push others, go out calmly or stay seated. 	<p>If you are trapped, keep calm and try to communicate with the exterior by hitting something.</p> <p>If you are at home or at work:</p> <ol style="list-style-type: none"> a) See if there are injured people and seek medical help. b) Check for damages. If there is a gas or water leak, report it immediately. c) Turn on the radio to keep yourself informed. d) Do not spread rumors or listen to them.

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SESSION INFORMATION

Week: 37

Session: 147

Expected learning outcome: Recognize the basic actions for preventing disasters in a local environment.

CONTENT DELIVERY

Start: Organize four teams. They should answer the questions in the section *How much do you know?* When they finish, elicit answers.

Development: Each team will present the following session one of the risks and preventive actions, described on pages 139 and 140. Therefore, segment the information so that every team reads and prepares just one segment.

Closing: Ask them to show their presentation draft.

SKILLS DEVELOPMENT

Critical thinking skills: Summarizing.

EVALUATION OF CONTENT

Check teams' drafts.

SESSION INFORMATION

Week: 37

Session: 148

Expected learning outcome: Recognize the basic actions for preventing disasters in a local environment.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

Homework: Organize three or four groups. Ask students to take cardboard, markers and visuals about preventive actions described on page 141.

Kind of risk.	Preventive actions		
	Before	During an earthquake	After an earthquake
Volcanic eruptions.	Get information about the following: a) If the area where you live can be affected by volcanic activity. b) The protection measures for home, the work place and school. c) How to collaborate with the rescue brigades. d) Have a battery-powered radio, flashlight and personal documents at hand.	Volcanic activity a) Evacuate your home when the authorities say so. b) Locate higher ground away from the volcano, in case there is the need to evacuate. Avoid lower ground. c) In case of falling ash, protect your eyes, nose and mouth. Close doors and windows and seal them with damp cloths. d) Keep away from the zone.	Volcanic activity a) Listen to the radio or television to get news about the emergency and possible instructions from the authority in charge. b) In case of a respiratory ailment, avoid contact with ash and stay indoors, until the authorities inform that there is no risk. c) Clean the ash from the roofs, since it is heavy and can make buildings collapse. d) Return home only with permission from the authorities.
Cyclones	Get information about the following: a) If the area where you live can be affected by cyclonic activity. b) Be on alert for the meteorological service and the National Defense. c) The danger lever of the area and the trajectory of the storm or cyclone when it has formed. d) Have a battery-powered radio, flashlight and personal documents at hand.	Hurricane a) Evacuate your home when the authorities say so. b) Stay in the smallest room in the house and that has the strongest walls. In case you are outdoors, seek shelter under a roof or in a place where you can be protected. c) Close the gas valve and disconnect the electricity. d) Do not go out under any circumstance in the eye of the storm. e) Keep the radio on at all times, so you can be informed about the trajectory of the hurricane and the vulnerable areas.	Hurricane a) Check the structure of the house and ask for the authority's help in case there is damage. b) Avoid contact with electrical cables and posts that have been knocked down by the winds. c) Do not eat food that has been in contact with water from rivers or tap water. d) Return home only with permission from the authorities.
Flooding	Get information about the following: a) If the area can be affected by floods. b) The protection measures for home, the work place and school. c) Install control valves to avoid water flow inside of the house, school or the work place. d) Have a battery-powered radio, flashlight and personal documents at hand. e) If time allows, move your valued possessions to a second story or a higher place.	Floods a) Listen to the radio or watch TV to be informed about the emergency. Cut off the power, the water and gas valves and evacuate your home if needed or the authorities say so. b) If you are outside go to higher ground and stay there. Avoid walking through moving water. If you are on the street, be careful while walking in the water, since manholes might be open due to the pressure and you can fall through the opening.	Floods a) Return home only when it is safe or when the authorities say so. b) Do not go inside buildings with water around them. c) When you go inside, use thick-soled shoes and a flashlight. d) Check walls, floors, doors and windows to make sure the building is not at risk of collapsing. e) Watch out for animals that could have been dragged in by the water. f) Take pictures of the damage, done to the house as well as the contents for insurance purposes.

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Kells

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Plans to Prevent Disasters at School, at Home and the Local Environment

At home or school, we must have a contingency plan for natural disasters (Fig. 5.15). Whatever the emergency, it is necessary to take into account the following points in order to decrease risk:

1. Be informed about the risks of disaster at school and at home.
2. Before building or buying a house, carry out a geological study to prevent sinking or landslides.

3. Locate the safest place to go to at home or at school.
4. Carry out permanent maintenance of roofs, water, electric installations, and drains.
5. Make a family, school and neighborhood safety plan:
 - a) Designate members of the family or school community.
 - b) Designate specific tasks for every member of the community.
 - c) Establish school brigades: prevention and fire fighting, first aid, evacuation, communication, safety and vigilance.
 - d) If possible, ask for help from Civil Protection of your state, municipality or sector.
 - e) Program the existing needs for the Prevention Plan.

Apply your knowledge

1. Get into teams of four and make a disaster prevention plan for your school and another one for home. Consider all the points on these pages to help you, especially the ones referring to the kind or kinds of risks in the places where you live or where your home is, since you will share the same or similar characteristics.
2. Ask your teacher for documents from Civil Protection, to know the activities of each brigade and some other particularities of the Prevention Plans in your state.
3. Present the plan to your classmates, talk about the similarities and differences and agree on one.

Importance in Communicating Actions Carried Out in the Local Environment to Prevent Disasters

None of the preventive actions, plans and projects for disasters have a reason to be if they are not passed on to all the population, and the whole community of a territory.

How much did I learn?

Work in teams of three and:

1. Design an informative brochure of the Disaster Prevention Plan that you made with the rest of the class. Draw, design and make it according to your creativity and interests.
2. Present your brochure to your classmates and choose one to reproduce for the whole school.
3. Talk about the following points:
 - a) Why is it important to make and spread the disaster prevention plans?
 - b) What did you learn in this subject?

They must all be informed to decrease the vulnerability of the population facing natural disasters.

The Segob and the National Association of Radio and Television signed an Action Agreement for the Social Diffusion of the Civil Protection Measures and Disaster Prevention. Its purpose is to spread campaigns to guide the population before, during and after an eventual emergency situation and contributes to the creation of a culture of Civil Protection.



FIG. 5.16 Earthquake drill.

SESSION INFORMATION

Week: 37

Session: 148

Expected learning outcome: Recognize the basic actions for preventing disasters in a local environment.

CONTENT DELIVERY

Start: Discuss which risk you consider feasible in your area.

Development: Students will make a preventive campaign to face such threat. They should make posters describing what to do.

Closing: Have students go to other classrooms and explain the school community what to do in case there is a natural disaster in your area.

141

SKILLS DEVELOPMENT

Interpersonal skills: Teaching others.

EVALUATION OF CONTENT

Students should actively participate in the preventive campaign.

SESSION INFORMATION

Week: 38

Sessions: 149 - 152

Expected learning outcome: Apply the content of the unit to do a project.

CONTENT DELIVERY

Start: Briefly explain what you will evaluate in their presentations: Relevant, clear information, visuals, comprehension-check questions, further information, collaborative work, and language use.

Development: Students should give their presentations. Assign time according to your class length. Help as necessary.

Closing: Students should ask comprehension-check questions to their partners. Then, ask them to self-evaluate their presentations using the same presentation parameters described in the rubrics.

Project

Natural Risks

This time your research will be about the natural risks present in your immediate area. We suggest you address it from the following aspects: kind of risk and its general characteristics, the environmental degradation it caused, prevention and actions planned to face another disaster of the same type and magnitude.

→ Reading

Work in teams of three and follow the steps you performed in the previous units. Answer the questions found at the end of the reading and choose a situation to work on. Share ideas, select sources of information, plan and do a model to backup your information and finally, present your project to your group including conclusions and points of view.

The Flood in Tabasco and Chiapas of 2007

It is considered the worst natural disaster faced in the state in 50 years caused by the flooding of the flatland of Tabasco by several rivers that cross it; the state of Tabasco is crossed by two of the greatest rivers in Mexico, the Usumacinta River and the Grijalva River. Along with other currents, they surpassed their historical limits due to heavy rain from the higher regions of Chiapas. The flood covered 80% of the state's territory.

The United Nations (UN) for the reduction of natural disasters says that the tragedy in Tabasco could have been avoided at a low cost; for example, through the establishment of early alert systems, the assessment of the risks, evacuation plans, education of the vulnerable population and planning the use of the land.

The ecosystems and the environment of the state were affected, more by pollutants that were diluted and transported by the water currents that went through rural and urban areas and settled on agricultural soils, wetlands, river basins and lagoons than by the flood. In many cases the pollutants even reached the ocean. Open air dumps and landfills also became sources of pollution with great impact since they were destroyed by the great amounts of solid and leachates from different locations and

ecosystems. In addition, the characteristics of the clay soil in a large part of the state and the superficial water tables that reinforce the pollutant's environmental effects must be considered.



Work in teams of three or four and answer the following questions:

1. Explain the kind of risk and the population's vulnerability in the disasters of the flood in the state of Tabasco.
2. What are the preventive measures the UN considers should have been taken?
3. Is the path to sustainable development obstructed by this kind of disasters? Explain how this happened in Tabasco because of the flood.
4. Which preventive measure would you suggest for a disaster such as the flood in Tabasco?

SKILLS DEVELOPMENT

Reading skills: Scanning.

Critical thinking skills: Formulating questions.

Listening skills: Understanding the message.

Metacognitive skills: Delivering content, self-monitoring, self-evaluating their presentation.

EVALUATION OF CONTENT

Follow the projects rubrics, Teacher's Guide page 163.

Evaluation

What I have learned

It is time to evaluate the knowledge acquired during this unit.
Read the following questions carefully and answer them.

- What is the relationship between quality of life and environmental sustainability?
The environment contributes to our quality of life as a source of natural resources, as a physical and biological well-being provider and as a psychological and recreational generator. The idea is to preserve the legacy for future generations.
- Do you remember an international agreement for the care of the environment? Mention one.
The Kyoto Protocol, The Rio Summit, On human development, Nairobi Declaration, Earth Summit in Johannesburg, Bali Summit, Cancún and Copenhagen climate change conferences.
- What are Protected Natural Areas? Explain.
They are areas protected to preserve their ecosystems, which have had no important alterations of their elements by people.
- In the world, the population is vulnerable to different events. Mention some of the geological, hydro- meteorological and sanitary risks.
Geological: earthquakes, volcanic eruptions. Hydro-meteorological: droughts, cyclones and flooding, tornadoes, etc. Sanitary: leaks of dangerous chemical or nuclear substances, plagues, intoxications, pollution.
- What is the importance of disaster prevention facing the different risks the populations are exposed to?
To protect the population at a national or an international level.
- Mention some prevention actions for a disaster.
Students' own answers.

Kells

Self-Evaluation

Read every aspect to evaluate and mark with a (✓) the level you reached.

Aspect to evaluate	I do it very well	I do it with difficulty	I need help doing it.
I explain the relationship between the quality of life and environmental sustainability.			
I recognize the participation of Mexico and representative countries in the care of the environment and sustainable development.			
I appreciate the importance of Protected Natural Areas, environmental services and clean technologies around the world and in Mexico.			
I identify the main risks and vulnerability of the population around the world and in Mexico.			

Co-Evaluation

Get together with a classmate and evaluate what you have learned about the following aspects. Discuss the importance of the prevention of disasters

Aspect to evaluate	I do it very well	I do it with difficulty	I need help doing it.
I recognize the importance of the participation of governments and society in the prevention of disasters.			
I recognize basic actions for preventing disasters in the local environment.			

143

SESSION INFORMATION

Week: 39

Sessions: 153 - 156

EVALUATION AND SELF EVALUATION

CONTENT DELIVERY

Start: Students should answer page 143 (Evaluation) prior to taking the unit assessment. Go through the answers; help them with techniques to study content they do not clearly remember.

Development: Students are to take the unit assessment. You can find it in the Teacher's Guide pages 159 to 161 along with the answer key on page 162.

Closing: Check their assessments, record the score and provide with feedback. You might want to use the Attendance and Evaluation formats that you can find the Teacher's Guide pages 166 and 167.

SKILLS DEVELOPMENT

Metacognitive skills: Self-monitoring, self-evaluating learning outcome.

EVALUATION OF CONTENT

Check students answers. For the unit assessment, check the answer key, page 162.

Teaching Strategies

The development of geographic skills

The study of Geography should be oriented to encourage students to develop skills that enable them to organize, guide and enrich the acquisition of knowledge, becoming active participants in their learning process. The geographic skills involve the management of concepts, as well as abilities and attitudes for students to act based on their experiences in a consciously, reasoned, independent and creative way; both inside and outside the school. To help students in this task, geography introduces the following competencies to be developed throughout this course:

1. Managing geographical information
 - Analyze, represent and interpret data in maps and charts.
 - Find and locate sights of interest.
 - Represent and interpret information from tables, graphs, charts and maps.
 - Manage different information on the local, state, national, continental and global scales.
2. Value the natural diversity
 - Analyze the relationship between the spatial components and natural processes of the Earth.
 - Value the distribution and importance of the Earth's components in the living conditions on the earth's surface.
 - Recognize the natural conditions of the geographic space on local, state, national, continental and global scales.
 - Participate in caring and conserving of the place where they live.
 - Promote a respectful, harmonious and sustainable relationship between human beings and nature.
3. Value the social and cultural diversity
 - Analyze the growth, distribution and mobility of the population and their diversity.
 - Recognize the characteristics and social problems of different territories and cultures to strengthen the construction of their own identity and value cultural diversity.
4. Reflect on socioeconomic differences
 - Find the relationship between the different components of the geographic space.
 - Recognize the socioeconomic inequality in modern societies.
 - Analyze the socioeconomic conditions in the local context.
 - Reflect on a smart and responsible consumption.
5. Active participation in the place where they live
 - Identify the components of the geographic space that affect the quality of life, the environment and disaster prevention.
 - Identify solutions to local problems.
 - Participate in an informed way in the care and conservation of the environment.

Developing projects in geography

Projects

The projects are a set of systematic activities that help to analyze a problem and suggest solutions. They provide an opportunity for students to do research on the world, analyze problems and suggest alternatives to solve them. They are not only research proposals, but they are opportunities to act in an informed way. Projects also involve the designing of a product that conveys the results of the researched

subject, allowing students to compare their reality with the topics they are studying, and to develop geographical skills, such as managing information.

The methodology of the project, involves a series of stages for its implementation: planning, development, communication and evaluation that follow the next steps in each stage.

Planning

- Define the situation or problem and integrate it to the knowledge acquired.
- Analyze the problem through questions that relate to knowledge.
- Define the purpose of the project, information sources, activities, products and a calendar or timetable for the activities.

Development

- Search for information in various sources, maps, the Internet, books, magazines and newspapers.
- Analyze the information.
- Develop products that present results of the research.

Communication

- Present the results of the research and project to communicate the ideas and discoveries.

Evaluation

- Evaluate the planning and consider doing modifications and adjustments.
- Assess the progress and development of the project, taking into account how students integrate their knowledge as a whole.
- Evaluate whether students are able to communicate and use their new knowledge.

General Teaching Guidelines

Structure of the Student's book

As we have mentioned before, the *Geography* textbook is divided into five units, where you will find the skills and learning outcomes clearly stated at the beginning for the students to be aware of what they will be learning throughout the unit.

The lessons inside the units include three main sections: *How much do you know? Apply your knowledge and How much did I learn?*

In the *How much do you know* section, students will be able to reflect on their background knowledge and will prepare them for the lesson, since they work as opening activities.

The section *Apply your knowledge* includes activities aimed at practicing and applying the knowledge students are acquiring with the lesson into their reality.

In the section *How much did I learn?* students will work on activities that will allow them to integrate their knowledge and abilities of the geographic space that they have already studied and practiced throughout the lessons.

Throughout the text you will find *Glossary* boxes, which include important words needed to understand the context and the lesson. Other important useful and interesting boxes are: *Curious Facts and To Learn More*, which provide students with additional cultural information about the topic.

In this Teacher's Guide you will find the Answer key to every activity included in the Student's book whose answers do not depend on students' own views. You will also find that every unit offers three types of evaluation: a Self-evaluation, a Peer-evaluation and a Formal evaluation as well as a Unit Assessment instrument. The answer key to each of the former type has been included as well.

Based on experience and as an extra way of having students develop critical thinking and language skills, have them write a report at the end of each topic or unit, in which they include the most important facts in the lesson they are studying. This activity will help students relate their knowledge with their reality and engage them to share a personal point of view of their place in the world.

We are sure that with your experience, enthusiasm and guidance, your students will succeed at accomplishing every set activity.

The author

Geography

Unit 1 Assessment

Date: _____

Name: _____

ANSWER THE FOLLOWING QUESTIONS.

1. Where did Charles Darwin explore for five years?

2. What components is geographical space made of?

3. What are the two types of natural components and what does each of them include?

4. What are the categories of Spatial Analysis?

5. Exemplify each of the spatial analysis categories:

6. Mention the three scales that a cartographic representation refers to:

7. What is a scale in a map?

8. Which are the two types of scales used in maps?

9. What are scales used for?

10. What are the names of the vertical and horizontal imaginary traced lines on Earth?

11. Explain which are the three coordinates that are considered essential to accurately locate a point on Earth's surface:

12. What is the difference between altitude and height?

13. What are Time Zones?

14. What is a projection?

15. Which are the main projections that are used in map building?

16. Describe the main characteristics of Mercator, Peters and Robinson projections:

17. Describe the applications of Satellite Images, the Global Positioning System and the Geographic Information Systems.

18. What is geographical space?

Geography

Unit 1 Assessment Answer Key

Students are expected to give in their own words the following information:

1. It is traceable because coordinates are given to identify it; it is differentiated because no exact duplicate exists; and it is changeable because the human race transforms it.
2. The components of geographical space are: natural, social, cultural, economic and politic ones.
3. Biological components include living creatures, like plants and animals; physical components include unanimated elements such as rivers, mountains, and weather.
4. Place, landscape, region and territory.
5. Place: plaza, Geographic space: rural, Landscape: desert, Region: Sahara Desert, Territory: Egypt.
6. Local, National, Global, Regional.
7. It is the relation between the real dimensions of the surface that is being represented and its proportion on the map.
8. Numerical and Geographical.
9. They are used to calculate other scales or distances within a map.
10. Imaginary lines; the main ones are meridians and parallels.
11. Latitude is the distance that exists between any point on Earth's surface and the equator (0°). Longitude is the distance that exists between any point on the surface of the Earth and the Greenwich Meridian. Altitude is the distance between a point on the Earth's surface, and sea level.
12. Height is calculated according to the geographical element up to its summit; altitude is measured according to sea level.
13. Time Zones are a universal and standardized system for time use.
14. A Map Projection is the process that the cartographer follows to trace a map according to specific needs.
15. Cylindrical, Conic and Azimuthal projections.
16. Mercator brought to the world a projection of a unique map where every projected straight line is loxodromic, which makes the direction accurate and real. In Peters' projection, meridians appear as parallel, vertical lines and the distance between parallels shortens as it approaches to the poles, thus allowing following exact paths on a projection with the help of a compass. Robinson developed a pseudo-cylindrical projection, where the central parallel, usually the Equator and a Central Meridian, cross in a right angle in the center of the map. At this intersection, the projection doesn't have any distortion. However, the distortion increases as we approach the edge of the map.
17. Aerial photography is an essential tool in cartography. These photographs allow the development of reliable and precise maps of vegetation coverage, urban growth, the evaluation of natural disasters, as well as to trace roadways.
18. Geographical space can be differentiated based on its specific coordinates.

Geography

Unit 2 Assessment

Date: _____

Name: _____

ANSWER THE FOLLOWING QUESTIONS.

1. What are tectonic plates?

2. What is an earthquake?

3. What volcanoes are there in Mexican territory?

4. Which are the four kinds of continental topography?

5. Mention one characteristic per topography.

6. Mention and locate the main mountain ranges in Mexico.

7. Mention five rivers in the world and indicate their location.

8. What is a watershed and why is it important?

9. Mention three watersheds in Mexico.

10. What is the difference between climate and weather?

11. Which are the elements of climate?

12. Which are the factors of climate?

Geography

Unit 2 Assessment Answer Key

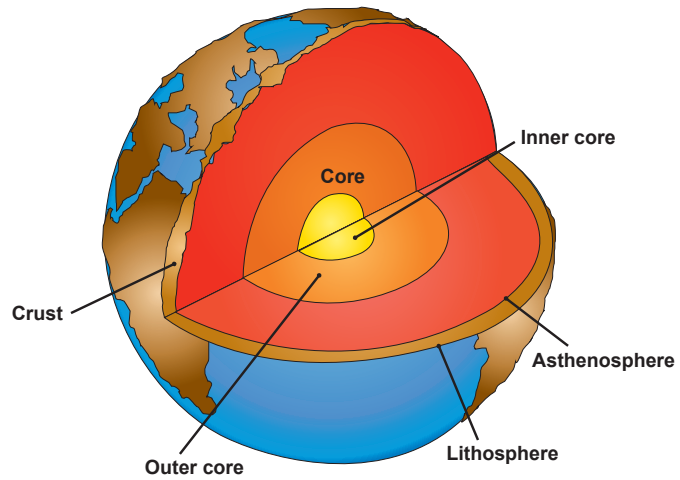
Students are expected to give in their own words the following information:

1. They are fragments of lithosphere that move like solid rocks without an internal deformation on the asthenosphere (external mantle or outside mantle of Earth).
2. It is a vibrational movement of Earth's crust.
3. The largest volcanic presence in national territory is found along the transversal volcanic system, where Pico de Orizaba, Popocatepetl, Iztaccíhuatl, Nevado de Toluca, Pico de Tancitaro, Paricutín, Ceboruco, Jorullo and Volcán Fuego de Colima are found among others.
4. Mountains, plains, plateaus and depressions.
5. In America, mountain ranges have been formed such as the Rocky Mountains. In Europe, there are a great number of mountain ranges like the ones that are found in the edge of the Mediterranean Sea. In Asia, the tectonic plates movement created the Himalayas. Plains and plateaus of various altitudes form Africa and the main mountain ranges are The Atlas Mountain and the Ahaggar Mounts. Oceania is full of islands, some of them volcanic whereas others are coralline.
6. Sierra Madre Oriental, Sierra Madre Occidental, Transvolcanic Belt, The Sierra Madre of the South, The Sierra of Chiapas, The Sierra of Baja California, Central Mexican Plateau.
7. Some examples may be: Papaluapan River, Mexico; Thames, England; Danube, Central Europe, Nile, Egypt, Rhine, Germany, Yellow River, China.
8. It is the zone that gathers all the water that comes from rain or springs into one river. They are important because they store water and therefore we can make use of it even during droughts. Besides, they keep the ecosystem where they are balanced.
9. The Usumacinta, The Grijalva, The Papaloapan watersheds.
10. The weather is the combination of atmosphere conditions at a certain moment in such a way that it can change in hours or days. The climate is the group of meteorological conditions that average along the year, taking as an average a minimum period of 10 years.
11. Temperature and precipitation.
12. The modifiers of elements: Latitude and longitude.
13. Tropical, dry, temperate, continental, cold or boreal, polar and perpetual ice climates.
14. Rainforest: high temperatures, abundant rainfall, woods high altitude, ferns; fauna consists of jaguar, spider monkey, great variety of insects among others.
Savanna: Meadows in warm, humid climate, livestock. Fauna consists mainly of lions, zebras, and gazelles among others.
Coniferous forest: Temperate climate and rains throughout summer. Fauna consists of deer, coyote, badger among others.
Deciduous forest: Temperate climate, wood products. Flora consists of: red oak, walnut tree, willow, and eucalyptus. Fauna consists of wild cats, bears.
Steppe: transition between the savannah and the desert. Livestock development. Fauna consists of hare, rabbit, and snakes. Flora consists of herbaceous and small sized grass, nopal, mezquites, and cacti.
Tundra: Very low temperatures all year. Flora consists of moss, lichens, and shrubbery.
Deserts: irregular rainfalls, extreme temperatures. Fauna: reptiles, roaders. Flora: Cacti.

15. It refers to the great plant and animal variety that inhabits our planet; that is, its natural riches.

16. The continental platform, continental drop, abyssal plain, ocean ridges, oceanic ditches, and coastal topography constitute it.

17.



18. It implies that we should preserve all the bio diverse populated areas because there are species that are not found anywhere else in the world and if we let them be destroyed, we lose a lot.

Geography

Unit 3 Assessment

Date: _____

Name: _____

ANSWER THE FOLLOWING QUESTIONS.

1. Why is there population growth?

2. What is mortality rate?

3. What does a population pyramid represent?

4. What is birth rate and how is it gotten?

5. What is population distribution and which factors cause it?

6. What is absolute population?

7. What is population density?

8. What does population concentration refer to?

9. What is population dispersion?

10. List some rural characteristics.

11. List some urban characteristics.

12. Explain three social problems of the world's population.

13. Explain causes and consequences of migration.

14. In migration, which are the expulsion countries and the attraction ones?

15. What is multiculturalism?

16. Explain the difference among traditional, contemporary and emergent cultures.

17. Why is intercultural coexistence important right now?

18. What is cultural homogenization?

19. What is the role of publicity and media in cultural homogenization?

20. Mention some examples of the world's cultural manifestations changes.

Geography

Unit 3 Assessment Answer Key

Students are expected to give in their own words the following information:

1. To birthrates higher than mortality rates as well as people with higher income in a country according to the number of people who leave that country.
2. It is the number of deaths that occur in a period of time. It is gotten dividing the number of deaths in a country per year by the previous total population divided by one thousand.
3. In a population pyramid, the information regarding the number of men and women who live in a country by age segment is represented which will help analyze a country's population life conditions.
4. It is the number or births that occur at a given period of time. It is gotten dividing the number of births per year in a country by the total previous population divided by one thousand.
5. It is the way in which inhabitants occupy their country's surface and it depends on natural factors (physical and geographical features), social factors (development opportunities) and economical factors (favorable conditions to do productive activities).
6. The total inhabitants of a country.
7. It is the number of inhabitants that exist per square kilometer.
8. To the proximity of different human settlements within a region.
9. Spacing in towns or cities in a specific area.
10. Rural life means life in the country. Therefore, main activities include agriculture, cattle industry, not industrialized manufacturing. There is great cultural wealth and people preserve traditions. People are usually participative and change-reluctant.
11. City life means life in the city. Therefore, main activities include industry and services. People accept changes and new customs. Their culture has multiple influences.
12. Marginalization, malnourishing, discrimination.
13. Migration occurs because of demographic, economical, political, religious, personal or social reasons. Some consequences may be population growth or reduction, birth rate reduction, mortality growth and scarce labor, among others.
14. Expulsion countries are the ones from which people migrate seeking for better life conditions. Attraction countries are the ones to which people go to settle.
15. It is respectful, peaceful, harmonic coexistence of diverse cultures that live in the same country or region.
16. Traditional cultures are the ones from ethnic groups. Contemporary cultures constitute the majority of current cultures and they derive from traditional ones; they have adopted technological elements that imply social and economical changes. Emergent cultures are groups with high income that have access to the latest technological and scientific innovations.
17. Different cultures interaction makes it possible to mutually benefit and coexist in a respectful way under the principle of equality. Coexistence results essential to avoid risks derived from incomprehension, discrimination and racism.
18. Culture homogenization is the unification of different cultural practices that do not necessarily identify individual cultures. The dominant culture nowadays is the American one, whose manifestations have spread throughout the world.
19. Products and services diffusion all over the world such as TV shows, music, movies, clothes, food, drink and electronics, among others.
20. Introduction of new celebrations, changes in the way of dress and talk, consumption of other kinds of food, transmission of sports events, massive shows.

Geography

Unit 4 Assessment

Date: _____

Name: _____

ANSWER THE FOLLOWING QUESTIONS.

1. Which activities is economy based on?

2. What is agriculture?

3. What is livestock?

4. What is forestry?

5. What is fishing?

6. What is mining industry?

7. Which are the three types of industry?

8. What is transformation industry?

9. What is manufacturing?

10. What is commerce?

11. Explain the three types of transportation.

12. How is communication made?

13. What is tourism and what kinds of tourism are there?

14. What are financial institutions? Mention some organizations in charge of offering financial services in the world.

15. What is globalization?

16. What are transnational companies?

17. What are commercial blocks? Mention two examples.

18. What is HDI and what aspects does it have?

19. What is the classification of countries according to their development level?

20. What is the GDP and which activities integrate it?

Geography

Unit 4 Assessment Answer Key

Students are expected to give in their own words the following information:

1. Agriculture, livestock, forestry, fishing and mining.
2. It is the soil use to grow food locally and commercially.
3. To raise animals for commodities production. It can be extensive (it uses space freely and feeds from what it can find or intensive (it has limited space and controlled diet).
4. It is forests exploiting, materials extraction that can be timber or non-timber products.
5. It refers to fish and other species capture that feed human beings. It is mainly done in the sea.
6. It is mineral extraction that is on Earth's crust. They can be metals (gold, silver, copper, aluminum, lead or iron), non-metals or energetic (petroleum, gas, coal).
7. Basic, heavy and transformation industries.
8. The one that produces goods for consumers' direct consumption.
9. Assembling pieces to form a final product.
10. Product exchange, either feedstock or elaborated products. It is present in a country or among countries, creating imports and exports.
11. Terrestrial transport: The most widely used in the world. It refers to the passenger or merchandise transport by highways or train. Sea transportation: It is made among countries in the sea. It can be for passengers or merchandise. Aerial transport: It is made with airplanes and it is mainly for passengers even though it is also used for mailing.
12. It is fast and efficient thanks to devices such as traditional and cellular telephones, Internet and television.
13. It is an activity that consists of visiting places with the objective of resting, knowing and enjoy free time. There can be different kinds of tourism according to the activities that are done in the visited place: free time, sports, business, culture, health and ecotourism.
14. They are organizations that get and administer monetary resources. Some examples are: Banco de México, World Bank, International Monetary Fund, and Inter American Development Bank.
15. It is the economical, technological, social and cultural process that consists of markets, societies and world cultures unification.
16. They are companies that by their size and importance operate in different parts of the world, stimulating the economy of the country where they are located.
17. They are blocks formed by different countries to get economical advantages. Two examples of commercial regions are the European Union and NAFTA.
18. It is the Human Development Index, a reference program created by United Nations to study socioeconomic inequalities. The HDI includes aspects such as life expectancy, education and life level.
19. Central countries (industrialized), peripheral (developing) and semi-peripheral (intermediate).
20. It is Gross Domestic Product and it is the production of final goods and services of a country during a certain period of time.

Geography

Unit 5 Assessment

Date: _____

Name: _____

CHOOSE THE CORRECT ANSWER.

1. What is desertification?
 - a) A process created by human activities. It consists of deterioration of soil, which prevents it from productive capacity.
 - b) That all trees are cut.
 - c) That the dessert grows.
 - d) That human beings destroy rivers.
2. What is closely related to people's quality of life?
 - a) The TV they can buy.
 - b) Education.
 - c) Processed food.
 - d) Electronic devices.
3. What is sustainable development?
 - a) It is a policy of planned exploitation of human force.
 - b) It is a policy of planned exploitation of social resources.
 - c) It is a policy of planned exploitation of recyclable materials.
 - d) It is a policy of planned exploitation of natural resources.
4. The environment contributes to three main aspects of quality of life, which are:
 - a) Source of natural resources, physical fit and psychological and recreational generator.
 - b) Source of natural resources, physical, well-being provider and psychological and recreational generator.
 - c) Source of unnatural resources, physical fit and psychological and recreational generator.
 - d) Source of natural resources, and psychological and recreational generator.
5. Which are some sustainable measures that are already being carried out?
 - a) Ecotourism, overexploitation of forests, alternative energies.
 - b) Ecotourism, recycling, use of alternative sources of energy.
 - c) Ecotourism, recycling and reuse gasoline.
 - d) Ecotourism, recycling and reuse of alternative sources of energy.
6. Why was the Club of Rome created?
 - a) To exchange opinions about how to win a war.
 - b) To exchange opinions about how to achieve economic growth no matter the cost.
 - c) To exchange opinions about how to achieve economic growth for human beings.
 - d) To exchange opinions about how to achieve economic growth for pets salvation.

7. What does the Kyoto Protocol treaty state?
- It's a treaty to set targets to reduce greenhouse gas emissions.
 - It's a treaty to set targets to reduce economic crisis.
 - It's a treaty to set targets to reduce consumption all around the world.
 - It's a treaty to set targets to reduce garbage production.
8. Which is the article in the Mexican Constitution that establishes Natural Resources care and use?
- Article 1.
 - Article 2.
 - Article 3.
 - Article 27.
9. Which is the article in the Mexican Constitution that establishes that all natural resources in Mexican territory belong to the Nation?
- Article 1.
 - Article 2.
 - Article 3.
 - Article 27.
10. What's the name of the Mexican Law regarding the Ecological and Environmental Protection?
- NAFTA.
 - DEEPNA.
 - NDEEPA.
 - LGEEPA.
11. What are PNAs?
- Protected Natural Areas.
 - Protein Naturally Augmented.
 - Protected Natural Animals.
 - Protected Natural Alligator.
12. Which are PNAs classifications?
- Alligator, crocodile, reptile.
 - Turtles, trees, tortoises.
 - Biosphere, national parks, sanctuaries, fauna and natural resources.
 - Biosphere, national parks, sanctuaries, flora and fauna protection, natural resources protected.
13. What is biomass?
- Organic matter created during a natural disaster, it can be used as an energy source.
 - Organic matter created during a spontaneous biological process, it can be used as an energy source.
 - Organic matter created during prehistoric times, it can be used as an energy source.
 - Organic matter created during a spontaneous biological process. It cannot be used as an energy source.
14. What are hydrological services?
- Capture of animals thanks to the rain or infiltration.
 - Capture of hydrogen thanks to the rain or infiltration.
 - Capture of water thanks to the rain or infiltration.
 - Capture of water and hydrogen thanks to the rain or infiltration.
15. What kinds of risks are caused by human beings?
- Epidemics, earthquakes, landslides, flooding.
 - Epidemics, explosives, fires, landslides.
 - Epidemics, explosives, fires, plagues.
 - Epidemics, explosives, fires, droughts.

16. What happens after a natural disaster in high-risk areas?

- a) There is environmental deterioration.
- b) There is a lot of media cover.
- c) There is environmental change for the best.
- d) There is environmental challenge.

17. What does vulnerability mean?

- a) To be exposed to be vulnerable.
- b) To be exposed to be poor.
- c) To be exposed to be killed.
- d) To be exposed to be hurt physically or morally.

18. Which are factors that influence vulnerability?

- a) Natural dynamic, precarious buildings, economic conditions, no civil protection programs.
- b) Natural disasters, precarious economic conditions, civil protection programs.
- c) Natural dynamic, precarious economic conditions, no civil protection programs.
- d) Natural disasters, precarious buildings, economic conditions, no civil protection programs.

19. Which is the national institution in charge of preventing national disasters?

- a) CENAPRED.
- b) CONADE.
- c) SEDENA.
- d) SACMEX.

20. What's the name of the plan that the Secretary of National Defense activates when there is a natural phenomenon in Mexico?

- a) DN-III-E.
- b) DN-II-E.
- c) DN-III-A.
- d) DN-II-A.

Geography

Unit 5 Assessment Answer Key

- | | |
|-------|-------|
| 1. A | 11. A |
| 2. B | 12. D |
| 3. D | 13. B |
| 4. B | 14. C |
| 5. B | 15. C |
| 6. C | 16. A |
| 7. A | 17. D |
| 8. C | 18. A |
| 9. D | 19. A |
| 10. D | 20. B |

Projects Rubrics

Aspect	Beginner	In process	Expert
Theoretical framework	The introduction is weak or there are major inaccurate aspects.	The introduction does not fit with the rest of the project or there are minor inaccurate aspects.	The introduction provides with accurate and relevant information.
Project evidence	The project has inaccurate data. It is irrelevant or repetitive and it contains questionable evidence.	The project has minor errors or it is not very elaborated.	The project is clearly explained.
Project design and performance	The variables are not controlled. The study object is not focused. There's a lack of data.	Some variables are controlled. The study object is focused. The data has mistakes.	The variables are under control. The study object is clearly focused. There are few data mistakes.
Conclusion	There is not a conclusion or it is not sustained.	There is a conclusion, but it is weakly sustained.	The conclusion is well sustained.
References	The reference list contains one or two sources but the references are incomplete.	The reference list contains three sources with complete references.	The reference list contains four or more sources with complete references.
Language use	The project is not very clear. It lacks organization, coherency or appropriate grammar use.	The project is clear, with a few flaws on organization, coherency or appropriate grammar use.	The project is coherently described and clearly stated with few grammar and spelling mistakes.
Collaborative work	Not all the members of the team presented or participated.	Some of the members of the team presented or participated.	All the members of the team presented or participated.

Resources list

Only extra materials have been included. In the content delivery notes you will find instructions describing when students should do research to deliver content.

Student book page:	Resources
Unit 1	
19	A map of Mexico, a map of America and a world map and a ruler the following class.
21	A map that has longitude and latitude divisions.
25	A world map.
26	A world map without political division or names, a world map with time zones, ruler, and pencil.
28	A device with Internet access.
32	In teams: A photo of a topographic map or chart from INEGI from any area in Mexico, vellum paper or any other paper that is semitransparent, a device with Internet access.
Unit 2	
39	A world map and an atlas.
40	A world map.
41	A piece of cardboard, markers, ruler.
45	A bar of plasticine or modeling clay, a piece of wood.
47	A map of Mexico, modeling clay (or plasticine) and a piece of wood.
51	A map of Mexico with hydrography.
52	A world map and a map of Mexico with names.
54	A sky lantern.
55	A piece of cardboard, markers.

56	Four pictures of different places showing different topography.
58	Each student will get a world map, and in teams of three or four students, a piece of cardboard, markers and pictures about a country they like from the following: Mexico, Brazil, Colombia, Ecuador, The U.S.A., Peru, Venezuela, China, Philippines, Indonesia, India, Malaysia, Madagascar, Congo, South Africa, Australia, Papua New Guinea.
Unit 3	
64	In trios, a piece of cardboard and markers.
65	Post-it notes.
66	A world map and vellum paper.
67	A world map and color pencils.
79	A device with Internet access.
80	In teams, pictures showing cultural diversity in Mexico, piece of cardboard, glue, scissors and markers.
84	A device with Internet access.
85	A device with Internet access.
Unit 4	
93	In teams, a piece of cardboard, markers, pictures of soil, marine flora and fauna, forests as well as stick glue, and scissors.
106	Half piece of cardboard, markers.
108	A world map and a map of Mexico with names.
Unit 5	
123	A device with Internet access.
132	Pictures of risks explained on pages 132 and 133.
134	A device with Internet access.
135	A device with Internet access.
141	Cardboard, markers, visuals about preventive actions explained on page 141.

Geography offers you an enjoyable, dynamic and creative way to learn about the elements that conform the space where we live and its surroundings. In this book, you will find interesting facts about the weather, topography, natural regions, the economic production and political organization of different regions, our country and other countries in the world. *Geography* will also provide you with opportunities to develop comprehension skills which will lead you to understand the natural, cultural and socioeconomic diversity in the world and how to take care of it.

Geography Teacher's Guide will help teachers facilitate learning through brief notes to deliver content, identify critical thinking skills, language skills or multiple intelligences skills used, and evaluate learning outcome page by page. This guide also includes answer key to exercises, suggestions for homeworks, games, activities, unit assessments with answer key, projects rubrics and attendance and evaluation list specially designed for the content of this book.

