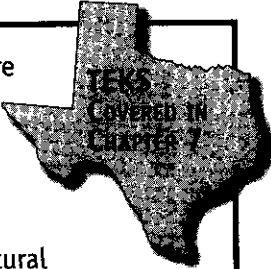


PEOPLE AND NATURE

■ **Geography 8** The student understands how people, places, and environments are connected and interdependent.

- **Geography 8(A)** Compare ways that humans depend on, adapt to, and modify the physical environment, including the influences of culture and technology.
- **Geography 8(B)** Describe the interaction between humans and the physical environment and analyze the consequences of extreme weather and other natural disasters such as El Niño, floods, tsunamis, and volcanoes.
- **Geography 8(C)** Evaluate the economic and political relationships between settlements and the environment, including sustainable development and renewable / non-renewable resources.

■ **Social Studies Skills 23(B)** Use case studies and GIS to identify contemporary challenges and to answer real-world questions.



From its origins, humankind has had to deal with the challenges posed by nature. From nature, humans have always obtained their food, shelter and clothing. When nature acts harshly, bringing storms, droughts, or fires, people have to respond.

In this chapter, you will learn how people are connected to their environment. You will study how humans interact with and modify their physical setting. You will also learn about the challenges that people sometimes face because of extreme weather, natural disasters, and limited natural resources.

AN ESSENTIAL QUESTION

● How do people adapt to or modify their physical environment?

- A. Humans depend on, **adapt** to, and **modify** their physical environment.
- B. Humans sometimes must respond to conditions of extreme weather or natural disasters, such as floods, tsunamis, and volcanoes. GIS can help people respond to such extremes of weather or natural disasters.
- C. People now seek to use **renewable resources**, to conserve non-renewable resources, and to pursue **sustainable development** to protect our environment.

GEOGRAPHIC TERMINOLOGY IN THIS CHAPTER

- | | | |
|---------------------|--------------------------|---------------------------|
| ■ Seismic Activity | ■ Climate Change | ■ Biodiversity |
| ■ Tsunami | ■ Renewable Resources | ■ GIS |
| ■ El Niño / La Niña | ■ Non-renewable Resource | ■ Sustainable Development |

Like all animals, people must adapt to the climate, landforms, vegetation, and natural resources they find in the place where they live. However, unlike most animals, humans also have the ability to **modify**, or change, their environment greatly.

HOW PEOPLE ARE AFFECTED BY THE ENVIRONMENT

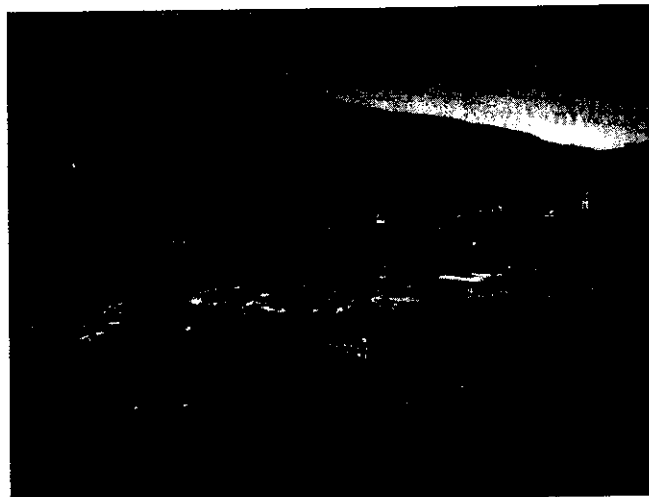
There are many ways in which people are affected by their physical environment. The environment affects their choice of foods, shelter, clothing, and general way of life. Certain aspects of the physical environment are especially important:

BODIES OF WATER

Fresh water is essential to human life. Indeed, the earliest civilizations arose in river valleys. Ancient Egyptians, for example, developed their civilization along the Nile River. Even today, most cities are located near a major body of water.

LANDFORMS

People are also affected by landforms. People generally settle in flat, fertile valleys and plains, where they can build homes and grow crops easily. Fewer people live in mountains, swamps or desert areas. However, even in these harsher environments, different groups often develop their own way of life. For example, the Berbers live in desert areas of North Africa, between the Sahara and the Mediterranean Sea. Their lifestyle is closely based on a close connection to their natural surroundings.



A Berber village in the desert.

★ What are some of the ways in which the physical environment affects people's lifestyles? _____

★ Give one example of how your activities are influenced by your environment.

HOW PEOPLE MODIFY THEIR ENVIRONMENT

Just as people are affected by their environment, they also affect their environment. Culture and technology often influence how people modify nature. Here are some of the chief ways that humans have modified the environment:

AGRICULTURE

Agriculture (*farming*) is the growing of food. Ten thousand years ago, people in the Middle East found that if they planted seeds and watered plants, they could grow fruits, grains and vegetables. They selected certain seeds to replant in order to grow the most nourishing plants.

Crop cultivation brought about modification and manipulation of the environment to increase food production — it altered the landscape by clearing existing vegetation, and cutting the soil by tilling it. People also learned to irrigate their fields to increase their productivity. Since humans first learned to plant seeds, civilizations around the world have generally turned forests, grasslands, and marshes into productive farmland.



Ancient peoples learned to plant seeds to grow food.

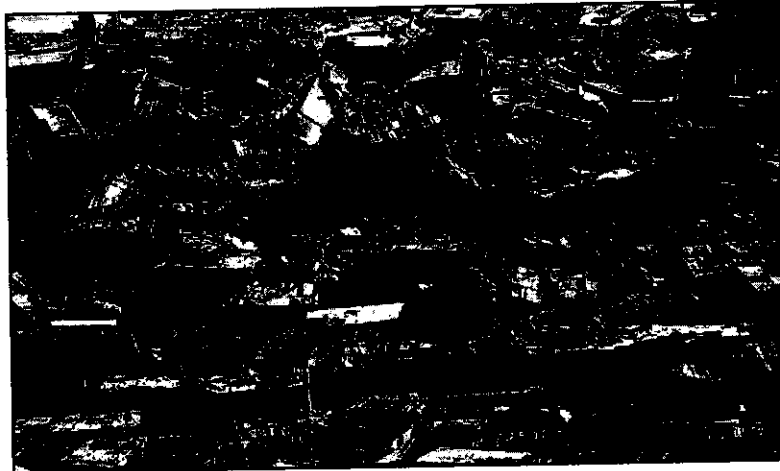
Complete the chart below. Indicate at least one of the positive and one of the negative effects of each of these human modifications to the environment:

Agriculture		
Urban Growth		
Building Dams		
Energy		

Extreme weather and other natural disasters pose special problems. These are not the typical conditions that people usually expect. Tornadoes, hurricanes, fires, earthquakes, tsunamis, and volcanoes, although infrequent, are events that can kill thousands of people and destroy buildings, bridges, and roads. Although unusual, people have always had to deal with extreme conditions and natural disasters, from ancient times to the present.

- ★ **Vesuvius Volcano.** In 79 A.D., the volcano at Mount Vesuvius erupted. Thousands of Romans were buried under volcanic ash in the city of Pompeii. The eruption also changed the course of the Sarno River and raised the sea.
- ★ **Krakatoa Volcano.** The island of Krakatoa was located in the Pacific Ocean. Its volcano exploded in 1873 with a force thousands of times more powerful than the atomic bombs used in World War II. It blew the island apart in one of the most violent eruptions in recorded history.
- ★ **San Francisco Earthquake.** In 1906, most of San Francisco was destroyed by a great earthquake, killing over 3,000 people. Scientists predict future earthquakes in this region.

The global community now cooperates when natural disasters strike. In 2004, many nations contributed to help those injured or displaced by the tsunami. In 2010, Haiti was hit by a devastating earthquake, killing 300,000 Haitians and leaving a million people homeless. People from nations around the world contributed food, medical supplies and help in the wake of this natural disaster.



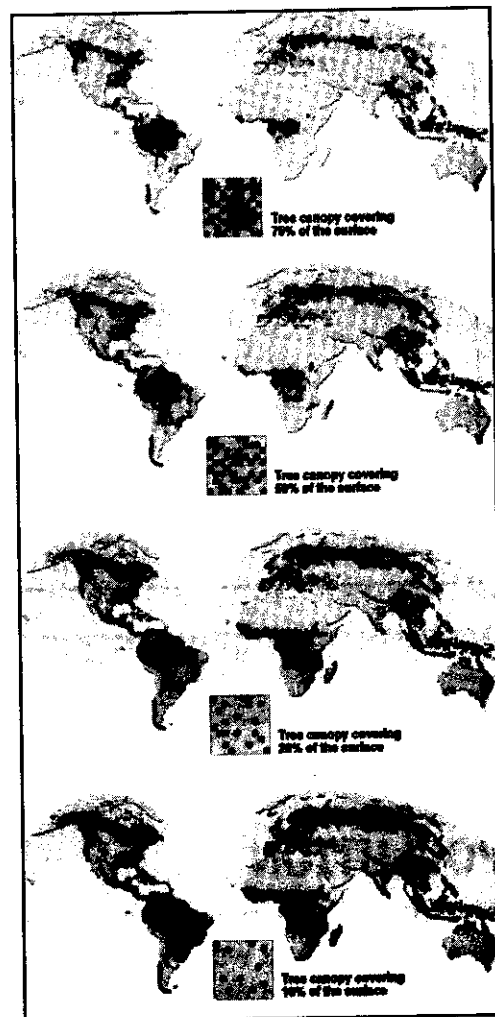
Part of the devastation caused by the earthquake in Port-au-Prince, Haiti.

GIS AND GLOBAL DISASTERS

Graphic Information Systems (*GIS*) are spatial information systems that merge information from satellites and land-based sources. These systems use global data from satellite photography, land-based maps, statistics, and other sources. Computers store this in digital form at each location on a map.

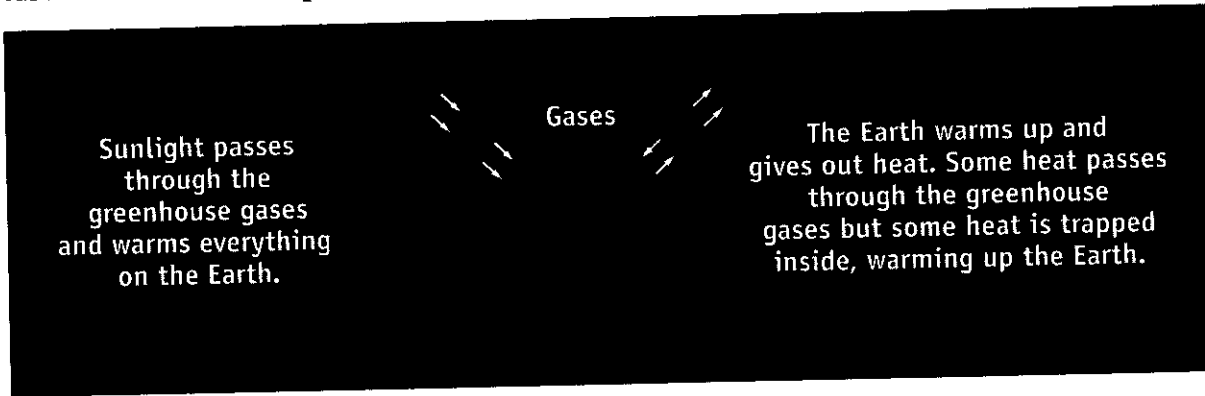
For example, a system was established in 1985 as an environmental database covering members of what is now the European Union. This system collected information on soil, landforms, climate, water resources, and pollution, as well as economic data. The United Nation's Environment GRID (*Global Resources Information Database*), based in Kenya, collects similar information for the entire world. Officials are able to use this data base to check information, to visualize issues, and to make accurate models and predictions. The environment GRID is now being used for a global deforestation project to study the decline of the world's forests.

GIS is especially useful for handling natural disasters. In the event of an earthquake, fire, or flood, officials can quickly obtain detailed information about landforms, water bodies, pipelines, power lines, sewer systems, buildings, roads, flood zones, and weather predictions for each location. Officials can quickly pinpoint potential hazards and can rapidly notify people and even evacuate areas.



Maps created by the U.N. Environment Grid.

- ★ **Climate Change.** The burning of fossil fuels like coal and oil (*gasoline*) has significantly increased amounts of carbon dioxide in the atmosphere. Carbon dioxide and water act together to wrap the planet in a blanket, holding in heat. With increased amounts of carbon dioxide, less heat is able to escape, leading to the “**greenhouse effect**.” If temperatures continue to rise, part of the polar ice caps could melt and sea levels would rise.



- ★ **The Ozone Layer.** Free oxygen combines with oxygen molecules to create ozone in the Earth’s upper atmosphere. This ozone absorbs much of the sun’s ultraviolet radiation. Without an ozone layer, ultraviolet radiation would cause mutations in most living cells. The use of chlorofluorocarbons as coolants in refrigerators and air conditioners threatens the ozone layer. Each CFC molecule can break down thousands of ozone molecules. As a result, an ozone “hole” has appeared in the Earth’s atmosphere, leading to increased incidents of skin cancer. Countries have agreed to ban CFCs, although some still use them.

- ★ **Pesticides.** Poisonous chemicals are used to control insects that threaten crops, but pesticides then become part of the water and soil, endangering other organisms, such as birds. Some pesticides may also be absorbed by the crops we grow for food. On the other hand, banning pesticides would make it difficult to grow enough food for everyone.

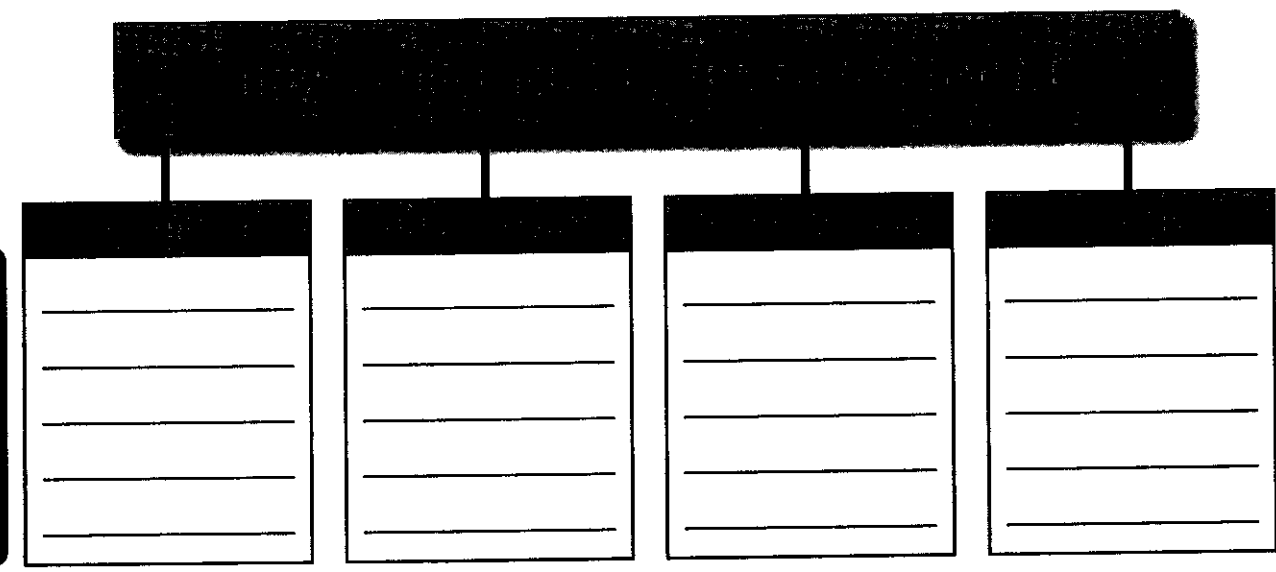
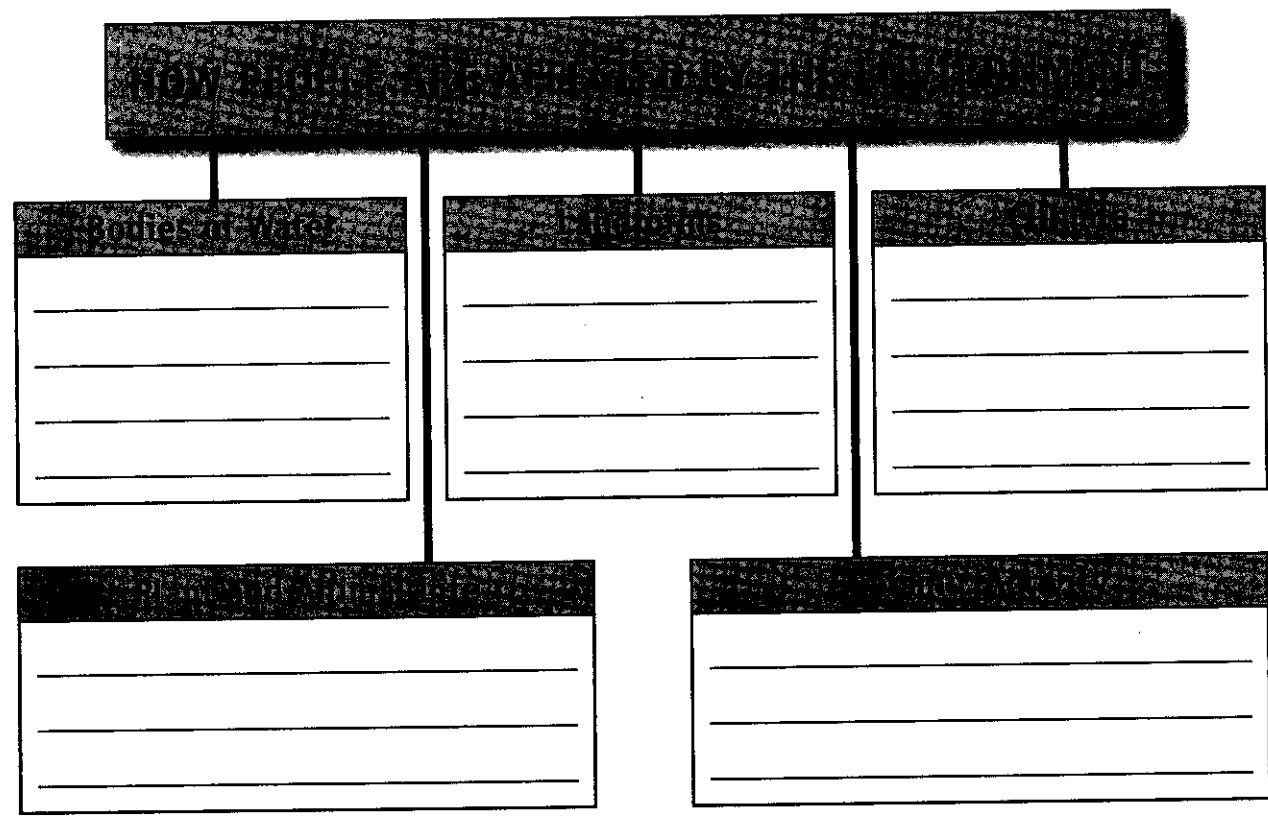
- ★ **Acid Rain.** When coal and oil are burned, they dump pollutants into the atmosphere. Many pollutants like sulfur dioxide turn into acids. These acids get washed out of the air when it rains. When these pollutants return, they are highly toxic, killing fish, destroying forests, eroding soil and further endangering the environment. The United States established the **Acid Rain Program** in 1990 to reduce pollutants causing acid rain. Acid rain is now two-thirds less than in 1976.



Acid rain damages forests, especially those at higher elevations.



Complete the graphic organizers below. Describe how people are affected by the environment. Then describe how people modify their environment.



UNLAWFUL TO PHOTOCOPY



Effects of Environment on People

- ★ **Bodies of Water.** People tend to settle close to water.
- ★ **Landforms.** People settle in flat, fertile valleys where farming is easier.
- ★ **Climate.** Average temperatures and precipitation have large impact on shelter, agriculture, and clothing.
- ★ **Plant and Animal Life.** The crops and livestock in an area greatly affect people's foods, clothing and homes.
- ★ **Seismic Activity.** Earthquakes and volcanoes may influence how homes are built.

How People Modify Their Environment

Just as people are affected by their environment, people can modify their environment in a number of ways:

- ★ **Agriculture.** People cut down forests and plow grassy plains to create farms.
- ★ **Urban Growth.** People build towns and cities.
- ★ **Building of Dams.** People seek to prevent floods and store water for drinking and irrigation.
- ★ **Energy.** People cut down trees, mine for coal, and drill for oil to meet their energy needs.



Natural Disasters

- ★ Natural disasters pose special problems to people's lives and property.
- ★ Earthquakes, tsunamis, and volcanoes caused by tectonic plate movement.
 - **Earthquakes.** e.g. Haiti in 2010.
 - **Tsunamis.** Indian Ocean tsunami (2004).
 - **Volcanoes.** e.g. eruption at Krakatoa in 1873 and in Iceland in 2010.

Earth's Resources

- ★ **Renewable Resources** include animals and plants, which can replenish themselves.
- ★ **Non-renewable Resources** include resources like fossil fuels that do not replenish themselves: oil, coal, natural gas.

Extremes in Weather

- ★ Changes in weather patterns can bring devastating conditions to some areas.
 - **Hurricanes**
 - **El Niño**
 - **Tornadoes**
 - **La Niña**

Sustainable Development

- ★ Reducing pollution and using Earth's resources at a slower rate so that they can be replenished.
- ★ Using resources to satisfy future as well as present needs.



Directions: Put a circle around the letter that best answers the question.

- 1 The current destruction of rainforests around the world is primarily due to the —
- A diseases carried by insects
 - B wildfires occurring during dry seasons
 - C devastation caused by high winds from tropical storms
 - D human demand for timber and farmland

DEPLETION OF NATURAL RESOURCES

Some resources, like trees, can renew themselves after a period of time. These are **renewable resources**. Other resources, like oil and coal, are **non-renewable**, and can only be used once. Many human activities, like the burning of fossil fuels, are using up Earth's non-renewable resources, while other activities are using renewable resources, like trees, at a faster rate than they can renew themselves.

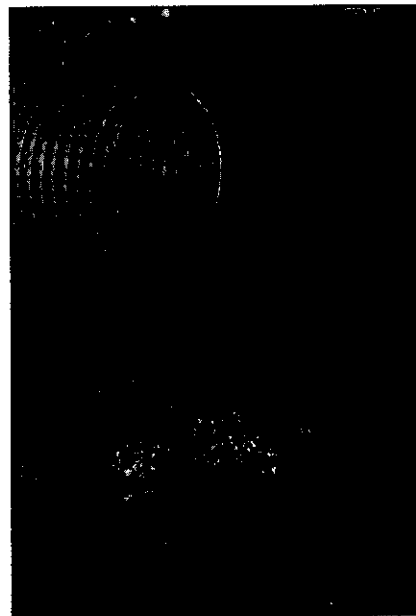
DESTRUCTION OF NATURAL HABITATS

One of the greatest threats to the environment is the destruction of many natural habitats. As the human population expands, more and more forests, wetlands, and grasslands are destroyed to build farms, factories, and cities. The destruction of tropical rainforests is one of the most dramatic examples of the loss of natural habitats. Tropical rainforests have the greatest **biodiversity** (*diversity of species*) and the greatest concentration of plant life on Earth.

The destruction of areas like the Amazon Rainforest reduces the amount of oxygen in the atmosphere and leads to the extinction of many species. More plant and animal species now become extinct each year than at any other time since the extinction of dinosaurs. This is especially important, since genetic material in some of the species facing extinction may contain cures to many diseases.

In order to solve these problems and challenges, many countries now seek **sustainable development**. This means using resources in a way that can meet future as well as present human needs. If we continue to rely on non-renewable resources and to pollute the Earth's atmosphere, land, and water at current rates, there will not be sufficient resources available for use by future generations. To achieve sustainable development means using renewable resources at a slower rate, so that nature is able to replenish itself.

This requires that both industrialized and developing nations must find ways to achieve economic growth without the reckless, wasteful and harmful use of natural resources. Ultimately, sustainable development is the realization that, since humans depend on their physical environment, they must also act to protect that physical environment.



Polluting Earth's resources threatens future generations.

Select a recent natural disaster. Prepare a three-minute oral presentation about that disaster. Describe what happened during the disaster and what efforts people made to cope with the disaster. Include a map and a photograph as part of your presentation. Use the space below to outline your presentation.

Today, human activities threaten many of Earth's natural processes.

POLLUTION

The rise of industry and the growth of world population in the past 200 years have led to a decline in air and water quality. Exhaust from cars and factories, together with liquid and solid wastes from manufacturing and urban centers, cloud the air and clog water supplies. Oil spills cover spots of the ocean and shoreline. Since almost all living organisms depend upon clean air and water, pollution poses a severe threat to the survival of life on Earth.

110 MASTERING THE TEKS IN WORLD GEOGRAPHY

★ **Indonesian Tsunami.** In 2004, an undersea earthquake in the Indian Ocean led to a giant tidal wave or **tsunami**. More than two hundred thousand people were killed in Indonesia and Thailand. Waves raced across the Pacific Ocean at hundreds of miles per hour, and waves as high as 100 feet struck coastal communities.

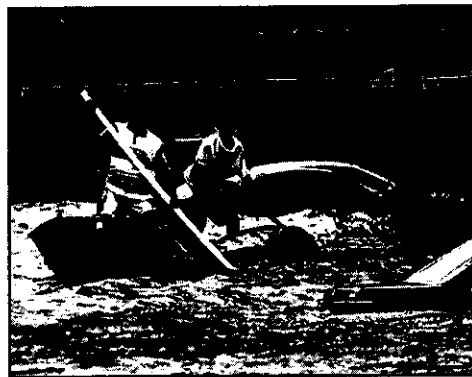
★ **Icelandic Volcano.** In 2010, a volcanic eruption in Iceland halted air travel throughout Europe for several days.

Volcanoes, earthquakes and tsunamis are often caused by tectonic plate movement. The location of many of these disasters, such as the “Pacific Rim of Fire,” can often be foreseen. Because these events are infrequent, people continue to return and rebuild in these otherwise inviting areas.



EXTREME WEATHER

Weather also sometimes brings dangerous conditions — including **hurricanes, tornadoes, floods, droughts, and extreme heat or cold**. For example, some scientists believe that rising temperatures from global climate change may be responsible for the increasing number of droughts. Lack of rainfall has brought **desertification** (*changing into a desert*) to areas like Africa’s Sahel region, south of the Sahara Desert. Rising global temperatures may also be responsible for the greater severity of tropical hurricanes. In 2005, **Hurricane Katrina** devastated the Gulf Coast and became one of the costliest natural disasters in United States history.



Hurricane Katrina flooded 80% of New Orleans, with some areas under 15 feet of water.

El Niño and La Niña. Rising global temperatures may also be contributing to the periodic warming of the surface of the Pacific Ocean, leading to **El Niño** (*the little boy*). This creates increased rain in the eastern Pacific Ocean and along the westcoasts of the United States and South America. At other times, known as **La Niña**, the surface of the Pacific is cooler, with opposite effects. La Niña brings heavier than usual rains to Southeast Asia.

HUMAN RESPONSES

There is no way to prevent extreme weather or periodic natural disasters. The challenge for humans is to predict them, prepare for them, and to reduce their devastating effects. For example in 1989, an earthquake in San Francisco led to far fewer deaths and less property damage than less severe recent earthquakes in India, Iran, China, or Haiti. Fewer deaths and less devastation occurred in San Francisco because buildings were specially designed to move with earthquakes rather than collapse.

URBAN GROWTH

People also modify nature by building towns and cities. The first cities arose in the Middle East. By 7,000 B.C., the city of Jericho had 3,000 residents. Sumer, the world's earliest known civilization, began on the plains of Mesopotamia in 3500 B.C. Later, ancient cities like Rome had as many as a million inhabitants.



The remains of ancient Sumerian streets and markets.

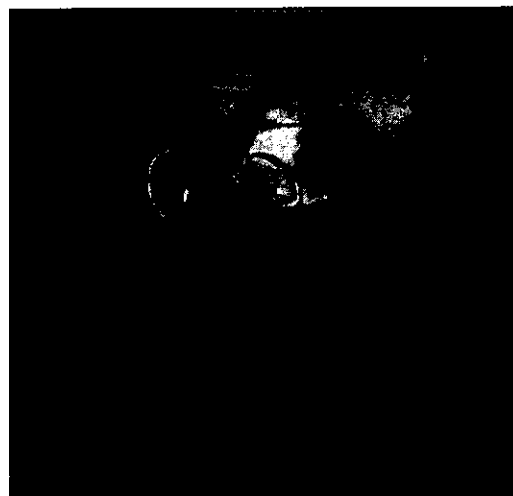
In the Middle Ages, urban centers were generally smaller. Agricultural improvements in the 1700s, increased overseas trade, and the rise of manufacturing during the Industrial Revolution led to the rapid growth of cities. Today, most people in industrialized countries live in cities. Urbanization changes the environment by concentrating thousands, even millions, of people in small, treeless areas. Cities replace open fields and forests with paved, concrete roads and tall buildings of steel, concrete, and glass. Public parks preserve some open areas.

THE BUILDING OF DAMS

Another way that people modify nature is by constructing dams to drain swamps, prevent floods, and to store water for drinking and irrigation. Dams also serve to generate electric power.

ENERGY

Humans further modify the environment to provide energy for their needs. Thousands of years ago, humans discovered the power of fire to warm themselves, to cook food and to heat water. This allowed humans to spread to new places where the climate was colder. Later, humans discovered they could also burn coal, whale oil, and forms of petroleum for light, heat, and power. Modern society continues to depend on burning fossil fuels like coal and oil. We dig mines in the ground for coal and drill holes for oil. However, the demand for oil can have destructive effects on the environment, such as the massive leak of crude oil when an oil rig exploded in the Gulf of Mexico in 2010. Its use also causes air pollution.



Early humans discovered the power of fire to protect and warm.

Few crops are able to be grown in frigid, barren areas above 10,000 feet. However, the ancient Incas flourished high in the Andes Mountains where they were able to develop root crops, such as the potato.

CLIMATE

Climate has a profound effect on how people live. For example, the Vikings of Norway wore heavy clothing made of wool, animal hides, and fur to protect them from the cold. In contrast, people who live in warm areas, like Egypt, wear light clothes to keep cool. Climate also affects what can grow in a region, and what livestock can live there. In the moist, warm areas of Southeast and East Asia, people developed the culture of growing rice as their main food. Growing

rice in flooded fields generally requires cooperation, strengthening social bonds among people. They make use of water brought by monsoon rains.



Rice farmers at work in a rice paddy.

PLANT AND ANIMAL LIFE

The types of vegetation and animals in an area also greatly affect human lifestyles. People often make use of local plants and animals as sources of food, clothing, and building materials. For example, the steppes of Central Asia are made up of dry, grassy hills and plains. These steppes receive enough rainfall to support the grasses and other plant life on which grazing animals feed, but not enough rain for farming crops. As a result, on these lands animal domestication and herding became the dominant way of life. For this reason, the peoples of Central Asia have generally been herders who were skilled at horsemanship. On the grasslands of North America, Native American Indians were hunters who lived on the meat and hides of the large numbers of wild buffalo. Peoples on the steppes of Asia and the Great Plains of North America both lived in tents made of animal skins, which they could move easily to follow animal herds.

SEISMIC ACTIVITY

Seismic activity refers to earthquakes and volcanoes. Because of seismic activity in the Pacific region, people in Japan have usually built their homes out of lightweight materials. These materials are less harmful if a building collapses during an earthquake. Often wood houses do not use nails. Instead, wood beams are grooved to fit together, so that the house will shift with an earthquake rather than crumble.

6 Which of the following is caused by the very rapid evaporation of warm ocean water in late summer months?

- F the erosion of a sandy beach
- G a tropical hurricane
- H a catastrophic forest fire
- J a tornado



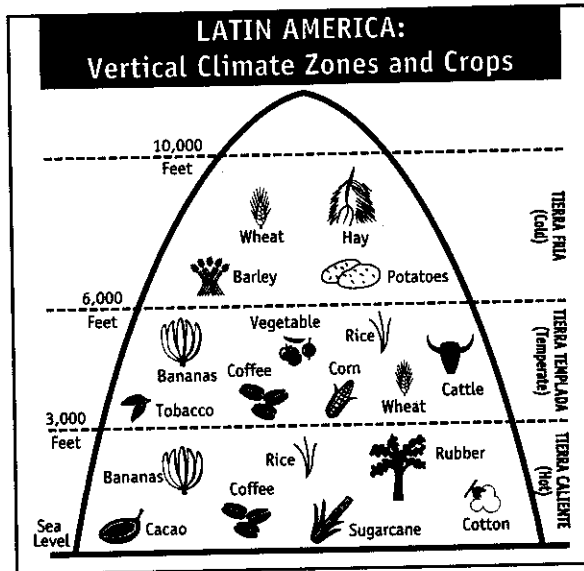
7 The most frequent cause of major earthquakes is the —

- A pressure from tectonic plate movement
- B occurrence of landslides
- C gravitational pull of the moon as it orbits Earth
- D change in underwater currents



8 Which of the following generalizations can be made from this diagram?

- F Vertical climates have no effect where people live.
- G Altitude has little effect on the growing season of crops.
- H Most crops cannot be grown above sea level.
- J Altitude has an important impact on the kind of crops grown.



Use the information in the boxes and your knowledge of social studies to answer the following question.

Tropical rainforests are found near the equator where ample rain falls.

Tall grasses dominate in areas that tend to be drier.

Plants that store water exist in areas with temperature extremes and little rainfall.

9 Which conclusion can best be drawn from these three examples?

- A Tall grasses grow well in the Great Plains.
- B Climate greatly influences the types of biomes found in different regions.
- C Cacti are usually found in desert areas where it tends to be dry.
- D Rainfall is one cause for the rapid growth of tropical rainforests.