Section 1

The Six Essential Elements of Geography

Main Ideas

1. Geographers study physical and human systems.
2. The six essential elements of geography are a way for geographers to organize their studies.

Why It Matters Today

People have lived in Texas and influenced its environment for thousands of years. Use current events sources to find information about how people affect the Texas landscape today.

Key Terms and People

- **geography**
- **environment**
- **culture**
- **geographic information systems**
- **ecosystem**
- **migration**
- **urbanization**
- **Roy Bedichek**

TEKS: 8A, 8B, 9B, 10A, 10B, 19D, 20A, 20D, 21A, 21B, 21C, 22A

*my*Notebook

Use the annotation tools in your eBook to take notes on the physical and human systems that geographers study.

The Geographer's World

Educator Roy Bedichek moved to a ranch near Austin in 1946. Writing to a friend, he described the natural beauty of the Hill Country. "A gentle rain started on the corrugated [grooved] iron roof a moment ago and I pulled the curtain of the southwest window to take a peep. . . . Suddenly as a flash on a motion-picture screen an *upright* rainbow in full and vivid colors appeared. . . . [I] stood there transfixed, a witness to a miracle."

The World in Spatial Terms

In order to understand the history of Texas, you must first learn about its geography. **Geography** is the study of the world, its people, and the interaction between them. Geographers study many aspects of the world, like how people adapt to their **environment**, or physical surroundings. They also study **culture**, or shared beliefs, traits, and values.

Texas is big—it covers about 267,000 square miles and has a population of more than 25 million. It is the second largest state in both size and population. Most Texans live in cities rather than in rural, or agricultural, areas. Yet Texas has close to 250,000 farms and some 130 million acres of farm and ranch land—more than any other state.

Geographers look at where things are on Earth's surface. For example, geographers studying Texas cities might find that they are typically located near sources of water, transportation centers, or other important cities. Changes in settlement patterns over time are also important.

Geographers use many tools in their studies, including maps, charts, and graphs. They also use field notes, interviews, photographs, reference books, and videos. High-tech tools such as satellites provide detailed images of Earth. Computer databases, like **geographic information systems** (GIS), store huge amounts of data, or information. Geography helps in planning for the future, including where new dams or roads should be built in Texas.

Reading Check **Finding the Main Idea** Explain the importance of geographic knowledge.

Places and Regions

People's culture and experiences affect their ideas of places and regions. A place has physical and human characteristics that make it special. Physical characteristics include animal and plant life, sources of water, climate and weather, landforms, and soils. Landforms are the natural shapes on Earth's surface, such as mountains, hills, and valleys. Human characteristics include ethnicity, language, political and economic systems, population distribution, religion, and standards of living.

A region is an area with common characteristics that make it different from surrounding areas. People define regions to organize the world. Regions can be as large as Texas, or as small as a neighborhood. A *formal* region has one or more shared characteristics. A formal region might be based on physical features such as the plant life that grows there. Formal regions could also be cultural, economic, or political. Countries, states, and cities are examples of formal political regions.

CONNECTING TO

SCIENCE AND TECHNOLOGY

GEOGRAPHIC TOOLS

Geographic information systems (GIS) are among the many tools used by geographers. Geographers also use technology such as computers, digital imagery, remote sensing, and satellites such as LANDSAT and GOES (Geostationary Operational Environment Satellite) to get satellite imagery of Earth. **How do you think these tools help students?**

Interpreting Visuals

Landscapes. *The Texas landscape is diverse with deserts, forests, plains, mountains, and swamps.* ***What does this image of Guadalupe Mountains National Park tell you about some of the landscape?***

Image Credit: (b) ©Yenwen Lu/E+/Getty Images

A *functional* region is made up of different places that function together as a unit. A newspaper's subscription area and a metropolitan area such as Dallas–Fort Worth are examples of functional regions. A *perceptual* region is defined by people's shared attitudes, culture, and feelings about an area. Perceptual regions, such as Central Texas or the Panhandle, often have vague borders. Geographers try to learn what defines a place or region and what makes it special.

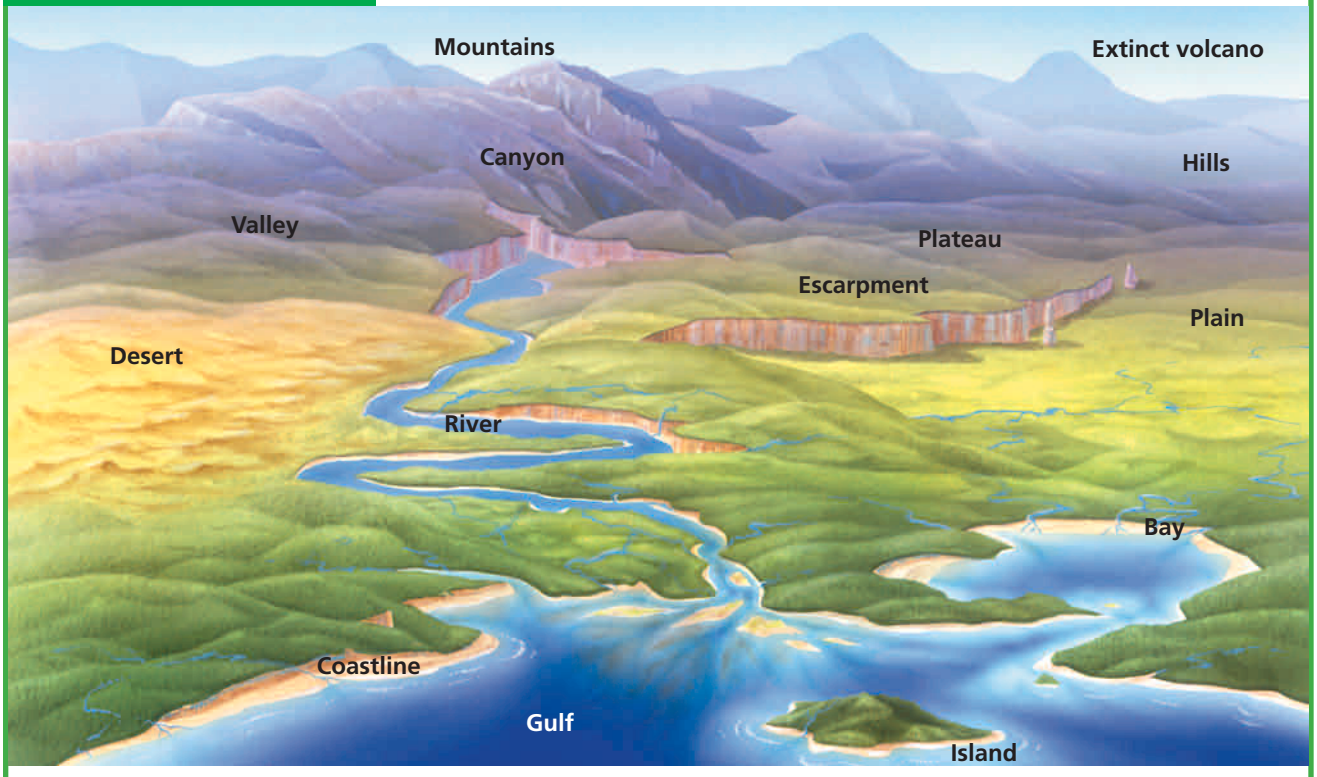
Reading Check **Categorizing** Choose a place or region and list three of its physical features and three of its human features.

Physical Systems and Human Systems

Geographers study the physical processes and interactions among four physical systems—Earth's atmosphere, land, water, and life. Physical processes shape and change Earth's physical features and environments. For example, Padre Island's coastline changes as tides from the Gulf of Mexico move beach sand. Climate and weather affect humans. For example, people might choose to live in an area that has a mild climate.

Texas Landforms

The Texas landscape is diverse. Traveling across the state, you could find plains, rivers, hills, deserts, and even mountains. Each of the landforms and waterways in this diagram can be found in Texas.



Visualizing History

1. **Geography** What can be learned about Texas geography from this diagram?
2. **Connecting to Today** What geographic features can you find near your school?

In some Central and North Texas areas the clay soil shrinks or swells depending on the weather. This affects how people build houses.

An **ecosystem** is all of an area's plants and animals together with the nonliving parts of their environment. A beach, an island, and a pond are ecosystems. Earth is the largest ecosystem. Natural events and human activity can change ecosystems. For example, in the 1930s drought and overgrazing led to the loss of topsoil and plant life in parts of North and West Texas. This hurt farming and ranching in the area. Studying physical processes and ecosystems is important because the environment is the setting for all life on Earth.

Studying human systems such as population distribution, growth, and movement helps in understanding human events and geography. Population growth is affected by a population's age, birthrate, death rate, and life expectancy. Changes in human activity such as advances in medical care and food production have led to population growth. Geographers also look at where people live and how crowded a region or place is when they study population density. They also study **migration**, or the movement of people. One specific type of migration is known as **urbanization**, which is an increase in people living or working in cities. Texas, like many places, is part of this trend.

Many geographers study the features of cultural groups. People often create groups that separate, organize, or unify areas. Geographers also consider human systems of communication, trade, and transportation in the global economy. Such human activities help explain how humans interact with one another and with the environment.

Reading Check **Identifying Cause and Effect** How did the weather change in the 1930s? How did this change affect the Texas economy?

BIOGRAPHY

Roy Bedichek (1878–1959) Roy Bedichek was an educator, folklorist, and journalist who moved to Texas from Illinois when he was about six years old. He attended the University of Texas, earning a bachelor of science and a master of arts. After college, he taught high school. Bedichek was a strong promoter of higher education. For many years he served as director of the University Interscholastic League (UIL). Bedichek was a gifted storyteller and wrote several books, including *Adventures with a Texas Naturalist*, *Karánkaway Country*, and a history of the UIL. **In what ways was Bedichek a leader in natural sciences and education?**

Environment and Society

One of the most important topics in geography is how people interact with the environment. Human activities can have positive effects on the environment. For example, people help restore the environment by planting trees in areas that have been deforested. However, human activities can also affect the environment negatively. As Houston's industry and population have grown, air pollution there has greatly increased. Some Texans have tried to limit the harm humans do to the environment. More than 60 years ago, Texas naturalist **Roy Bedichek** warned of the dangers of changing the environment.

TEXAS VOICES

"The gentle gardener poisons his soil to kill pillbugs and in so doing annihilates [wipes out] great numbers of beneficial creatures, including the lowly and lovely earthworm."

—Roy Bedichek, quoted in *Three Men in Texas*, by Ronnie Dugger.

Analyzing Primary Sources
Identifying Cause and Effect According to Bedichek, why do some gardeners change the environment? to what effect?

That's Interesting!

Miles and Miles of Texas

Getting around Texas can take a while. Distances within the state are huge. Texas spans more than 800 miles from its northwest corner to its southern tip. El Paso, in far West Texas, is closer to Los Angeles, California, than to Orange in East Texas.

The environment affects humans as well. Physical features such as landforms and rivers can influence where people live, and people depend on the environment for survival. Human life requires three basic resources—air, water, and land. Other natural materials, such as wood and coal, are also important resources. As the world population grows, demands on resources increase. Geographers study the location, quality, and quantity of Earth's resources and the effect of human activity on these resources. Historians use geography to understand history. They look not only at when things happened but also at where and why they happened. For example, suppose you need to know when, where, and why the first settlement in San Antonio was built. You would need to know that water sources such as the San Antonio River influenced the settlement's location.

Geography helps people understand the present as well as the past. For example, the growing population of Texas has placed greater demands on the environment. In response, many communities in Texas have created water-conservation programs to help preserve this important natural resource. These programs are one way that Texans are using their knowledge of geography to plan for the future. Many geographers use the six essential elements to organize their studies and to help them understand the geography of Texas.

1. The World in Spatial Terms
2. Places and Regions
3. Physical Systems
4. Human Systems
5. Environment and Society
6. The Uses of Geography

Reading Check **Analyzing Information** Explain how human actions could cause water pollution. What are the possible results for the natural resources of Texas?

Section 1 Review

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1. Define and explain:

- geography
- environment
- culture
- geographic information systems
- ecosystem
- migration
- urbanization

2. Identify and explain the significance of:

- Roy Bedichek

3. Categorizing

Copy the table below. List the six essential elements of geography. Then describe each element.

Essential Element	Purpose

4. Finding the Main Idea

a. Describe the types of information geographers study.

b. How do humans adapt to and modify the physical environment?

5. Writing and Critical Thinking myWriteSmart

Analyzing Information Imagine that you are a geographer scheduled to speak to a classroom. Write a speech describing geography and what you do. Consider the following:

- the definition of geography
- the importance of geography