Where on Earth do humans live?

Module Overview

This module focuses on Earth as our home and investigates the physical and human landscapes in which we live. Students learn that the world's population is unevenly distributed, and they begin to understand the environmental factors that influence this distribution.

***Investigation 1:* What are physical and human-made features?**
During this investigation students identify physical and human-made features using images from space. They match images of physical features with definitions of those features and identify physical and human features in images of several U.S. cities.

***Investigation 2:* What is there to see from sea to shining sea?**
This investigation builds on the first investigation in this module. Students locate and identify more physical and human-made features in the United States using images from space and create their own U.S. maps that are illustrated with NASA images. The song "America the Beautiful" is used to help students recognize that our country has many different regions and that the landscape of our country is very diverse.

***Investigation 3:* How do images help us learn about our planet Earth?**
Students interpret a nighttime image of the world using the arrangement of lights to identify broad patterns of world population distribution. They use maps showing landforms and climate regions to help explain the patterns.

***Investigation 4:* Where are the cities?**
Students compare an image showing nighttime lights in the United States with atlas maps in order to identify major cities and relate population distribution patterns to the physical environment. By locating cities and physical features identified in the nighttime image on an outline map, students become more familiar with important locations in the United States. They also use atlas maps and geographic information to identify NASA images of areas around several major cities.

Geography Standards

The World in Spatial Terms
- **Standard 1:** How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective

Places and Regions
- **Standard 4:** The physical and human characteristics of places

Environment and Society
- **Standard 14:** How human actions modify the physical environment

The Uses of Geography
- **Standard 17:** How to apply geography to interpret the past

Science Standards

Unifying Concepts and Processes
- Systems, order, and organization

Science as Inquiry
- Abilities necessary to do scientific inquiry

Science and Technology
- Abilities to distinguish between natural objects and objects made by humans

Science in Personal and Social Perspectives
- Characteristics and changes in populations
- Changes in environments

Connections to the Curriculum

This module can be integrated into social studies classes when introducing map and globe skills, continents, landforms, physical systems, differences between regions and cities, or global settlement patterns. The investigations strengthen scientific inquiry skills such as observing, predicting, inferring, classifying, and noting patterns. The song "America the Beautiful" provides a Language Arts connection as students interpret the lyrics and master new vocabulary.

Time

Investigation 1: Two 45-minute sessions
Investigation 2: Two 45-minute sessions
Investigation 3: One 45-minute session
Investigation 4: Two 45-minute sessions

Mathematics Standards

Geometry

- Use visualization, spatial reasoning, and geometric modeling to solve problems

Measurement

- Understand measurable attributes of objects and the units, systems, and processes of measurement
- Apply appropriate techniques, tools, and formulas to determine measurements

Technological Literacy Standards

Nature of Technology

- **Standard 1:** The characteristics and scope of technology

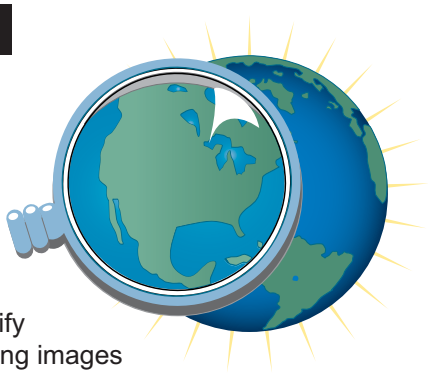
Technology and Society

- **Standard 4:** The cultural, social, economic, and political effects of technology

The Designed World

- **Standard 20:** Construction technologies

What are physical and human-made features?



Investigation Overview

During this investigation students identify physical and human-made features using images from space. They match images of physical features with definitions of those features and identify physical and human features in images of several U.S. cities.

Time required: Two 45-minute sessions

Materials/Resources

Figure 1: An astronaut photographs Earth (overhead transparency)
Globe
Crayons
Scissors
Map of the United States
Log 1: What are physical features? (one copy per group of four students)
Log 2: Satellite images of physical features (one overhead transparency and one per group of four students)
Log 3: New Orleans, Louisiana (one overhead transparency and one per group of four students)
Log 4: Corpus Christi, Texas (one overhead transparency and one per group of four students)
Log 5: Panama City, Florida (one overhead transparency and one per group of four students)
File folders (two per group of four students)
Old magazines

Content Preview

To survive, people depend on the physical environment. They adapt to it and modify it to suit their changing needs for things such as food, clothing, shelter, and energy. They build homes, roads, airports, canals, and dams and transform the environment. Human-made features and naturally occurring features such as rivers, lakes, and coastlines can be observed from space using satellites and Space Shuttle photography. Natural features generally have irregular boundaries while human-made features have more regular geometric shapes.

Classroom Procedures

Beginning the Investigation

1. Show students a globe and guide students to identify its shape as a sphere. Ask if anyone can find the continent on which we live. Have a student locate North America on the globe and name it. Ask students to identify and name the six other continents and four oceans. Write the words *Physical Features* on the board. Tell them that physical

Geography Standards

Standard 1: The World in Spatial Terms

How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective

- Identify and describe the characteristics and purposes of geographic representations, tools, and technologies.

Standard 4: Places and Regions

The physical and human characteristics of places

- Use a variety of graphic materials and data sources to describe the physical and human characteristics of a region.

Geography Skills

Skill Set 2: Acquire Geographic Information

- Make and record observations about the physical and human characteristics of places.

Skill Set 4: Analyze Geographic Information

- Use texts, photographs, and documents to observe and interpret geographic trends and relationships.

Skill Set 5: Answer Geographic Questions

- Use methods of geographic inquiry to acquire geographic information, draw conclusions, and make generalizations.

features describe the features of the land such as landforms and water bodies. An example of a physical feature is an island. Ask students to identify other physical features that can be seen on the globe. (*Lake, mountain range, island, gulf, bay, peninsula, etc.*)

Developing the Investigation

2. Divide the students into groups of four and give each group a copy of **Log 1**. Instruct students to cut out the physical feature definition boxes. Give each student in each group two of these boxes and have them draw a picture of these physical features. Then ask each group to assemble its eight pictures and in a class discussion compare the various pictures of each feature.

   desert: a land area that receives very little precipitation and thus has sparse vegetation
   island: an area of land surrounded by water
   mountain: a natural elevation of Earth's surface; more rugged, steeper, and higher than a hill
   river: a large natural stream of water emptying into an ocean, lake, or larger body of water
   bay: any inlet of the ocean bordering on land and partly surrounded by land
   ocean: the mass of salt water that surrounds the continents
   lake: an inland body of water usually of considerable size
   peninsula: an area of land which projects out from a larger land mass and is almost surrounded by water

3. Tell the students that one of NASA's main goals is to learn about our Earth so that we will be able to understand and eventually predict both natural and human-induced global changes. Explain that people make changes to the environment to produce human-made features. Write *Human-Made Features* on the board and ask students to name some human-made features that are in their hometown, e.g., *buildings, bridges, airport, city, town, canal, etc*.

4. NASA uses satellites to produce images of Earth's physical and human features. Astronauts also take photographs of the physical features and human-made features on Earth. Ask students why it might be difficult for astronauts to locate the features they want to photograph. *(Looking down at Earth from space, there are no boundary lines to help identify the places at which one is looking: north and south are not "up" and "down"; clouds can keep one from seeing the ground, etc.)* Tell students that astronauts have been taking photographs of Earth since the 1960s, and that they receive special training in order to learn to recognize Earth's features. Show the overhead transparency of **Figure 1**, a photograph of John Glenn taking photographs from the Space Shuttle. Have a student point to his camera. Speculate with the class about the views from his window. Tell students that now they are going to use Space Shuttle photographs to identify physical features located on our planet.

5. Distribute a copy of **Log 2** to each group. Explain that these are satellite images. Instruct students to cut out the images. Now, tell them to examine the images and match them with the definitions in the boxes they cut out in **Log 1**. After students have completed this task, show the transparency of **Log 2** and ask students to identify each physical feature. Discuss how images from space look different than those taken from the ground. Show students the location of these places on a map of the United States. (See **Evaluation** below for place names).

6. Give each group a copy of **Logs 3**, **4**, and **5**. Explain that these are photographs taken by astronauts from the Space Shuttle. Help the students to explore how they are different from the satellite images. (*They were taken from a lower altitude, so you can see more details in a smaller area. They were taken at an angle, from a window, while the satellite images are produced from satellites that are directly overhead.*)

7. Have each student circle one physical feature with a sharp green crayon and one human-made feature with a sharp red crayon. Then have them take turns listing the kinds of physical and human-made features they see in each photograph on a separate sheet of paper.

8. Show overhead transparencies of **Logs 3**, **4**, and **5**, and have students compare their responses.

Concluding the Investigation

9. Give each group two file folders and old magazines, and tell them that they are going to make pop-up folders. Demonstrate to the students how to make a folder, and repeat the directions as they make their own folders. Each folder will have two sections cut from the folded side and pushed inward, so that when the cover is opened the two sections pop up.

Directions: Place the folder with the folded side toward you. Along the folded side, measure 5 centimeters from the left edge and cut a 7.5 centimeter slit into the folder. Then, measure 12.5 centimeters from the same edge, and make another 7.5 centimeter slit into the folder. Next, measure 5 centimeters from the right edge of the folder and make a 7.5 centimeter slit and measure 21.5 centimeters from the same edge, and make the last 7.5 centimeter slit. Now, open the folder and pull the portion between the two slits on the left and the two slits on the right in toward the center. Close the folder, and crease the pieces into the inside of the folder. Open the folder and these two sections will pop up. Label one folder *Physical Features* and the other *Human-Made Features*, and paste pictures to illustrate each topic on the pop-up sections of each folder.

Evaluation

Log 2: Satellite images of physical features

a. Desert (Sonoran Desert)
b. Mountain (Mount Rainier)
c. River (Colorado, San Juan, and Escalante Rivers)
d. Island (Lanai, Hawaii)
e. Bay (Chesapeake Bay)
f. Lake (Lake Tahoe)

Log 3: New Orleans, Louisiana

Physical features—bay, river, island, ocean, coastline, lake
Human-made features—city, buildings, highway, bridge, streets

Log 4: Corpus Christi, Texas

Physical features—lakes, river, sandbar or island, bay, coastline
Human-made features—city, buildings, highway, bridge, streets, cultivated fields

Log 5: Panama City, Florida

Physical features—peninsula, bay, coastline, channel, beaches, sandbar, river
Human-made features—city, buildings, highway, bridge, cultivated fields

Figure 1: An astronaut photographs Earth

Module 3, Investigation 1: Log 1

What are physical features?

During this investigation, you will work as a group to identify physical features of our Earth. Cut out the definition cards and use them to help you identify each of these places.

desert

a land area that receives very little rainfall

island

land area surrounded by water

mountain

a natural elevation of Earth's surface, more rugged, steeper, and higher than a hill

river

a large natural stream of water emptying into an ocean, lake or larger body of water

peninsula

an area of land which projects out from a larger land mass and is almost surrounded by water

bay

any inlet of the ocean bordering on land and partly surrounded by land

ocean

the mass of salt water that surrounds the continents

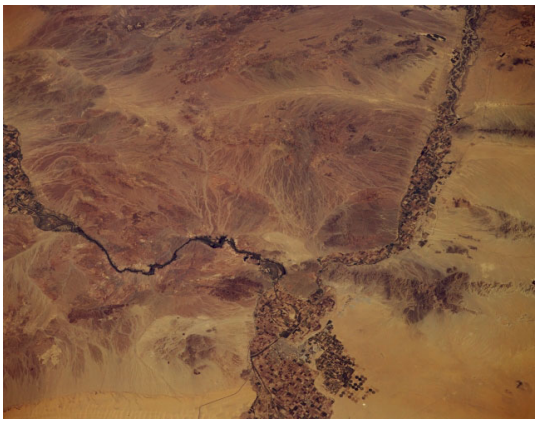
lake

an inland body of water usually of considerable size

Module 3, Investigation 1: Log 2

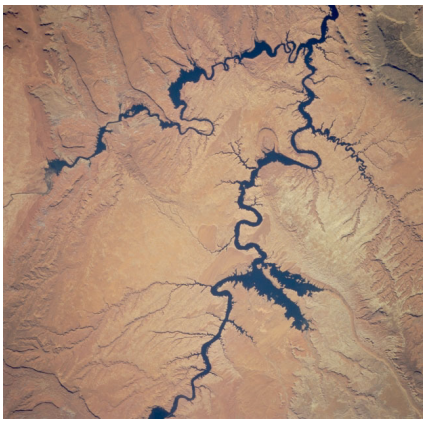
Satellite images of physical features

Directions: Cut out the boxes that contain satellite images of physical features.



a

b



c

d

e

f

Module 3, Investigation 1: Log 3
New Orleans, Louisiana

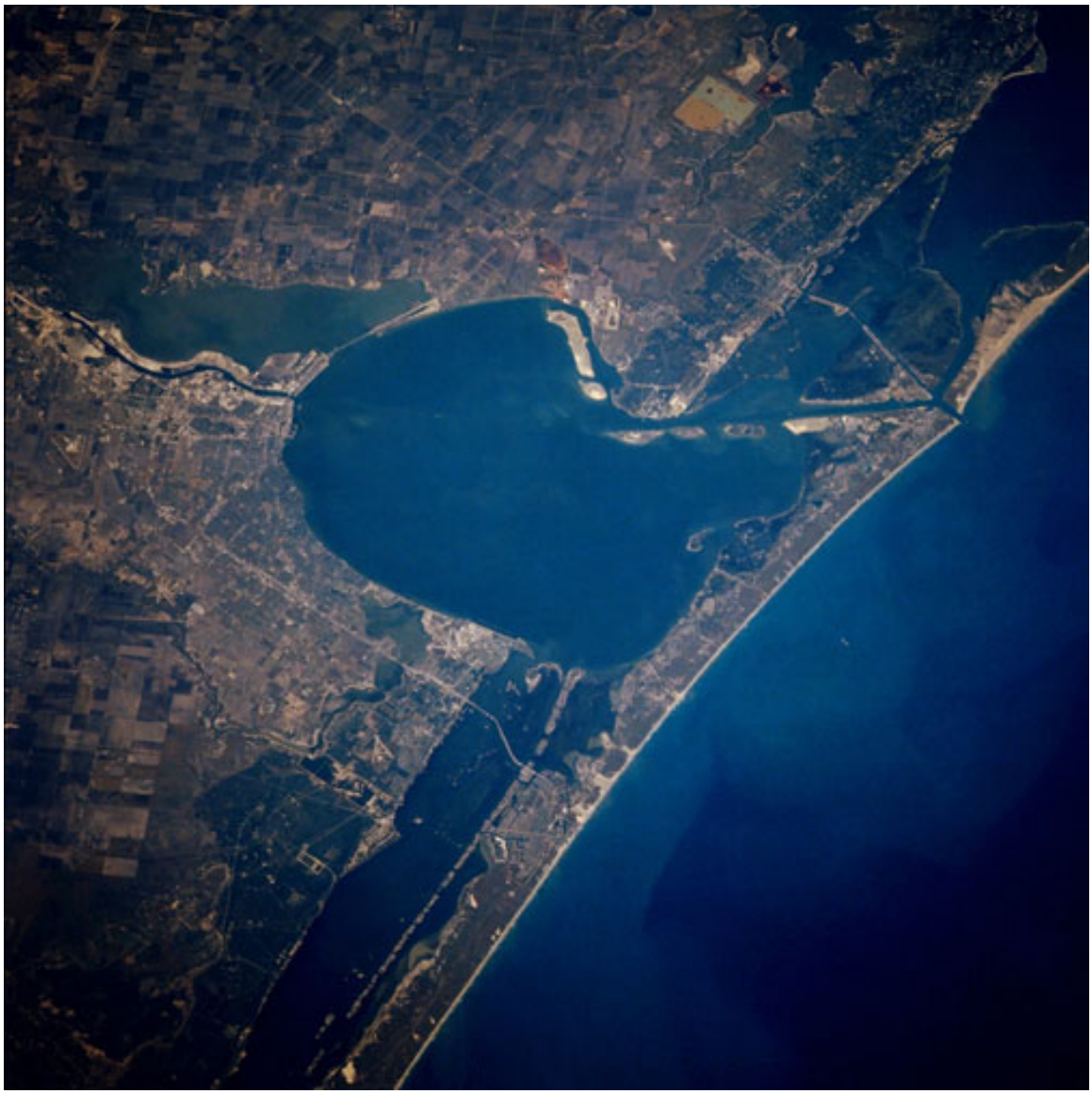
Name _____ Date _____

1. This photograph was taken by an astronaut from the Space Shuttle. Have each person in your group circle one physical feature with a green crayon and one human-made feature with a red crayon.

2. Take turns listing each kind of physical feature you can see in the image on the left side of a sheet of paper and all the human-made features on the right side. Put the headings *Physical Features* and *Human-Made Features* at the tops of your lists.

Module 3, Investigation 1: Log 4
Corpus Christi, Texas

Name _____ Date _____



1. This photograph was taken by an astronaut from the Space Shuttle. Have each person in your group circle one physical feature with a green crayon and one human-made feature with a red crayon.

2. Take turns listing each kind of physical feature you can see in the image on the left side of a sheet of paper and all the human-made features on the right side. Put the headings *Physical Features* and *Human-Made Features* at the tops of your lists.

Module 3, Investigation 1: Log 5
Panama City, Florida

Name _____ Date _____

1. This photograph was taken by an astronaut from the Space Shuttle. Have each person in your group circle one physical feature with a green crayon and one human-made feature with a red crayon.

2. Take turns listing each kind of physical feature you can see in the image on the left side of a sheet of paper and all the human-made features on the right side. Put the headings *Physical Features* and *Human-Made Features* at the tops of your lists.