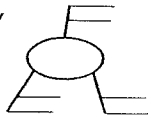


READING TOOLBOX

Spider Map

Create a spider map that summarizes the branches of Earth science. Use the green heads in this section as the legs of your spider map, and add one or two branches to each leg.



geology the scientific study of the origin, history, and structure of Earth and the processes that shape Earth

oceanography the scientific study of the ocean, including the properties and movements of ocean water, the characteristics of the ocean floor, and the organisms that live in the ocean

Academic Vocabulary

technology (tek NAHL uh jee) tools, including electronic devices

Branches of Earth Science

The ability to make observations improves when technology, such as new processes or equipment, is developed. Technology has allowed scientists to explore the ocean depths, Earth's unseen interior, and the vastness of space. Earth scientists have used technology and hard work to build an immense body of knowledge about Earth.

Most Earth scientists specialize in one of four major areas of study: the solid Earth, the oceans, the atmosphere, and the universe beyond Earth. Examples of Earth scientists working in these areas are shown in **Figure 2**.

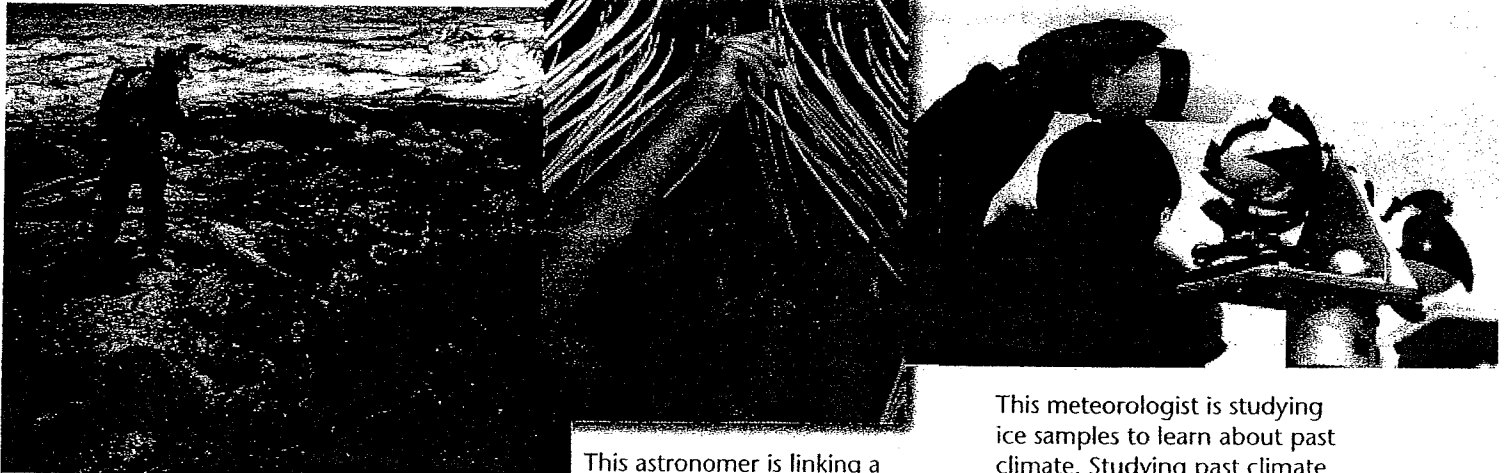
Geology

The study of the origin, history, processes, and structure of the solid Earth is called **geology**. Geology includes many specialized areas of study. Some geologists explore Earth's crust for deposits of coal, oil, gas, and other resources. Other geologists study the forces within Earth to predict earthquakes and volcanic eruptions. Some geologists study fossils to learn more about Earth's past. Often, new knowledge forms new areas of study.

Oceanography

Oceans cover nearly three-fourths of Earth's surface. The study of Earth's oceans is called **oceanography**. Some oceanographers work on research ships that are equipped with special instruments for studying the sea. Other oceanographers study waves, tides, and ocean currents. Some oceanographers explore the ocean floor to obtain clues to Earth's history or to locate mineral deposits.

Figure 2 Fields of Study in Earth Science



Geologists who study volcanoes are called volcanologists. This volcanologist is measuring the properties of moving lava.

This astronomer is linking a telescope with a specialized instrument called a spectrograph. Information gathered will help her catalog the composition of more than 100 galaxies.

This meteorologist is studying ice samples to learn about past climate. Studying past climate patterns gives scientists information about possible future changes in climate.

Paragraph 1

Paragraph 2

Paragraph 3

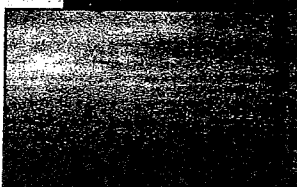
Paragraph 4

Why It Matters

More than a Pretty Picture

Scientists use a variety of instruments and methods to study Earth. For example, common methods for studying climate change include analyzing ice cores and tree rings. Now, one innovative scientist has turned instead to art. Scientists know that volcanic ash in the atmosphere blocks sunlight, which causes temperatures to drop. Could painting shed light on past temperatures?

J.M.W. Turner made the top painting three years before a volcanic eruption in the Philippines in 1831. He made the bottom painting in 1833. The redder sunset in the bottom painting was caused by volcanic ash.



EYE ON THE ENVIRONMENT

OUR TURN

CRITICAL THINKING

How could studying paintings by different artists affect scientists' conclusions?

Meteorology

The study of Earth's atmosphere is called **meteorology**. Using satellites, radar, and other technologies, meteorologists study the atmospheric conditions that produce weather. Many meteorologists work as weather observers and measure factors such as wind speed, temperature, and rainfall. This weather information is then used to prepare detailed weather maps. Other meteorologists use weather maps, satellite images, and computer models to make weather forecasts. Some meteorologists study *climate*, the patterns of weather that occur over long periods of time.

Astronomy

The study of the universe beyond Earth is called **astronomy**. Astronomy is one of the oldest branches of Earth science. In fact, the ancient Babylonians charted the positions of planets and stars nearly 4,000 years ago. Modern astronomers use Earth-based and space-based telescopes as well as other instruments to study the sun, the moon, the planets, and the universe. Technologies such as rovers and space probes have also provided astronomers with new information about the universe.

meteorology the scientific study of Earth's atmosphere, especially in relation to weather and climate

astronomy the scientific study of the universe

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Science
Code: HQX0191

Reading Check What information is used for weather maps?

(See Appendix G for answers to Reading Checks.)

The Branches of Earth Science

Name: _____

1. The Earth scientist most likely to study storms is a(n)
 - A. geologist
 - B. meteorologist
 - C. oceanographer
 - D. astronomer

2. What can you imply the word "origin" means in the passage?
 - A. where something came from
 - B. how unique something is
 - C. where something will eventually go
 - D. the color or appearance of something

3. The study of the origin of the solar system and universe in general is:
 - A. geology
 - B. ecology
 - C. meteorology
 - D. astronomy

4. How long ago were the first observations about Earth made?
 - A. a few years ago
 - B. a few decades ago
 - C. hundreds of years ago
 - D. thousands of years ago

5. The earth scientist most likely to study volcanoes is a(n)
 - A. geologist
 - B. meteorologist
 - C. oceanographer
 - D. astronomer

Match the following vocabulary to the definition:

- | | |
|-----------------|---|
| 6. Meteorology | The scientific study of the origin, history, and structure of Earth |
| 7. Astronomy | The study of Earth's oceans |
| 8. Geology | The scientific study of Earth's atmosphere, especially in relation to weather and climate |
| 9. Oceanography | The scientific study of the universe |

Match the topic of research to the career:

- | | |
|-------------------|-----------|
| 10. Meteorologist | Waves |
| 11. Astronomer | Volcanoes |
| 12. Geologist | Universe |
| 13. Oceanographer | Weather |

