



### Estimated Time

To give students practice under more realistic testing conditions, allow them 30 minutes to answer all of the questions in this practice test.



**Question 3** Answer C is correct. Scientists use seismic waves to determine the composition and size of Earth's interior. Answers A and D are incorrect because scientists can drill only a few kilometers into Earth's crust, not enough to reach the interior layers nor to directly observe them. Answer B is incorrect because rock samples at the surface tell us little about the interior of Earth.

**Question 4** Answer G is correct. Convection causes materials of different temperatures and densities to rise and fall in the mantle. This movement drives volcanic activity at the surface. Answer F is incorrect because radioactive decay provides only a very small amount of Earth's internal energy. Answers H and I are similar forms of energy transfer that provide little energy transfer to the surface.

### Understanding Concepts

*Directions (1–5):* For each question, write on a separate sheet of paper the letter of the correct answer.

- 1 The crust and the rigid upper part of the mantle is found in what part of the Earth?
  - A. the asthenosphere
  - B. the lithosphere
  - C. the mesosphere
  - D. the stratosphere
- 2 Because phosphorus rarely occurs as a gas, the phosphorus cycle mainly occurs between the
  - F. biosphere, geosphere, and hydrosphere
  - G. biosphere, geosphere, and atmosphere
  - H. geosphere, hydrosphere, and atmosphere
  - I. biosphere, hydrosphere, and atmosphere
- 3 How are scientists able to study the composition and size of the interior layers of Earth?
  - A. by direct observation
  - B. by analyzing surface rock samples
  - C. by using seismic waves
  - D. by deep-drilling into the interior layers
- 4 Which of the following methods of internal energy transfer drives volcanic activity on Earth's surface?
  - F. radioactive decay
  - G. convection
  - H. kinetic transfer
  - I. conduction
- 5 Earth's primary external energy source is
  - A. cosmic radiation
  - B. the moon
  - C. distant stars
  - D. the sun

*Directions (6–7):* For each question, write a short response.

- 6 What do decomposers break down to obtain energy?
- 7 What scientific principle states that energy can be transferred but that it cannot be created or destroyed?

### Reading Skills

*Directions (8–9):* Read the passage below. Then, answer the questions.

#### Acid Rain

Acid rain is rain, snow, fog, dew, or sleet that has a pH that is lower than the pH of normal precipitation. Acid rain occurs primarily as a result of the combustion of fossil fuels—a process that produces, as byproducts, oxides of nitrogen and sulfur dioxide. When combined with water in the atmosphere, these compounds form nitric acid and sulfuric acid. When it falls to Earth, acid rain has profound effects. It harms forests by damaging tree leaves and bark, which leaves them vulnerable to weather, disease, and parasites. Similarly, it damages crops. And it damages aquatic ecosystems by causing the death of all but the hardiest species. Because of the extensive damage that acid rain causes, the U.S. Environmental Protection Agency limits the amount of sulfur dioxide and nitrogen oxides that can be emitted by factories, power plants, and motor vehicles.

- 8 According to the passage, which of the following contributes to the problem of acid rain?
  - A. the use of fossil fuels in power plants and motor vehicles
  - B. parasites and diseases that harm tree leaves and bark
  - C. the release of nitrogen into the atmosphere by aquatic ecosystems
  - D. damaged crops that release too many gases into the atmosphere
- 9 Which of the following statements can be inferred from the information in the passage?
  - F. Acid rain is a natural problem that will correct itself if given enough time.
  - G. Ecosystems damaged by acid rain adapt so that they will not be damaged in the future.
  - H. Human activities are largely to blame for the problem of acid rain.
  - I. Acid rain is a local phenomenon and only damages plants and animals near power plants or roadways.

### Answers

#### Understanding Concepts

1. B
2. F
3. C
4. G
5. D
6. dead organisms
7. First Law of Thermodynamics

#### Reading Skills

8. A
9. H

#### Interpreting Graphics

10. F
11. B
12. Answers may vary. See Test Doctor for a detailed scoring rubric.