Answer Key
Chapter 1 Introduction to Earth Science

SECTION 1 WHAT IS EARTH SCIENCE?

Review
1. First row, from left to right: Geology; study fossils to learn about Earth's history second row, from left to right: Oceanography; oceans; explore the ocean floor third row, from left to right: Earth's atmosphere; study climate fourth row, from left to right: Astronomy; the universe beyond Earth

2. Possible answer: Ancient Greeks studied rocks and minerals. Like Earth scientists today, the ancient Greeks recorded what they discovered so that this knowledge could be shared.

3. Environmental science uses information from a variety of different fields to study how humans interact with the environment. Earth science is one field that contributes knowledge to environmental science.

4. Astronomers use technology such as telescopes and spacesuits in order to observe objects in space that people are not able to study with just their senses.

SECTION 2 SCIENCE AS A PROCESS

Review
1. In an investigation, a scientist changes one factor to see how the change affects another factor. The factor that the scientist changes is the independent variable. The dependent variable is the factor that is affected by the independent variable.

2. making observations, asking questions, creating a hypothesis, testing the hypothesis, drawing conclusions, communicating results

3. Accuracy describes how close measurements are to the correct value. Precision describes how exact the measured values are.

4. Peer review is important because it helps makes sure that only well-supported research is published.

5. Possible answer: Cars are helpful because they allow people to get where they need to go. However, cars can be dangerous machines that cause injury and death. They also burn gasoline, which leads to air pollution

Chapter 2 Earth as a System

SECTION 1 EARTH: A UNIQUE PLANET

Review
1. first column: structural second column, from top to bottom: asthenosphere; mesosphere; outer core; inner core third column, from top to bottom: crust; mantle fourth column: compositional

2. Earth is a giant magnet. The compass needle is attracted to Earth's magnetic poles.

3. On a mountain peak, you would be farther from Earth's center than you would be at sea level. The weight of an object depends in part on its distance from Earth's center. Earth's pull on you would be smaller when you are on a mountain peak, so your weight would be smaller.

SECTION 2 ENERGY IN THE EARTH SYSTEM

Review
1. Possible answer: I breathe air, which makes up the atmosphere, and I drink water, which makes up the hydrosphere. I play soccer on a grassy field. The grass on the field is part of the biosphere, and the soil is part of the geosphere.

2. The human body is an open system. Both matter and energy can enter and leave the body. A human body can absorb and give off heat energy. Food is an example of matter that enters the body; air is an example of matter that leaves the body.

3. Sunlight heats air and water. The heat produces wind and currents, which move air and water. Gravity from the sun and moon also causes water to move.

4. Bacteria in soil and roots convert nitrogen gas into ammonia. Lightning converts nitrogen gas into nitrates.

5. The atmosphere is a reservoir in the carbon, nitrogen, and water cycles. It is not a reservoir in the phosphorus cycle.