Chapter 1

The Physical Earth

1 GETTING STARTED (Student's Book pages 2–3)

READING AND THINKING ABOUT THE TOPIC

Answers to step 2 (Student's Book page 3)

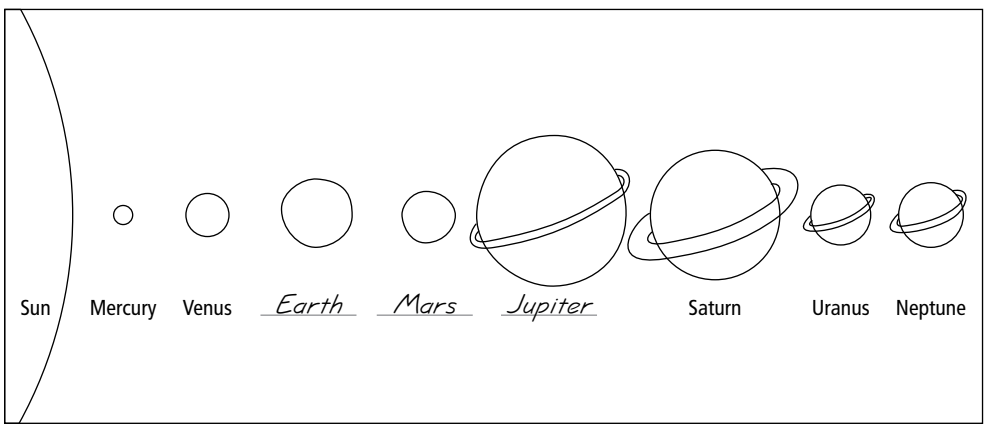
1 The four terrestrial planets are Mercury, Venus, Earth, and Mars. The four gas giants are Jupiter, Saturn, Uranus, and Neptune. The difference is that terrestrial planets are made mostly of rock. The gas giants are made mostly of gas.

2 Earth is the only planet in the solar system with liquid water on its surface.

LISTENING TO DIRECTIONS

Answer to step 2 (Student's Book page 3)

Students' drawings should look similar to this diagram:



2 AMERICAN VOICES: Brad, Gaby, and Jane (Student's Book pages 4–9)

BEFORE THE INTERVIEWS

BUILDING VOCABULARY: UNDERSTANDING WORD PARTS

Answers (Student's Book page 4)

1 geology = the study of the Earth

2 meteorology = the study of the atmosphere
biology = the study of life and living things
seismology = the study of earthquakes
volcanology = the study of volcanoes
hydrology = the study of water

3 geologist = A person who studies the Earth

4 meteorologist = A person who studies the Earth's atmosphere
volcanologist = A person who studies volcanoes
biologist = A person who studies life on Earth
hydrologist = A person who studies water
seismologist = A person who studies earthquakes

SHARING YOUR KNOWLEDGE

Answers to step 1 (Student's Book page 5)

1 seven, five
2 Asia, Australia
3 Mt. Everest
4 the Dead Sea
5 the Nile
6 the Sahara

Answers to step 3 will vary.

INTERVIEW WITH BRAD: Geology

LISTENING FOR MAIN IDEAS IN AN INTERVIEW

Answers to step 2 (Student's Book page 6)

- ☑ The meaning of *geology*
- ☑ The reason Brad decided to become a geologist
- ☐ The disadvantages of being a geologist
- ☑ The project Brad is working on now
- ☐ Brad's future goals
- ☑ Brad's feelings about geology

Answers to step 3 (Student's Book page 6)

Geologists study what the Earth is made of and how it moves.

From a young age, Brad asked many questions about the Earth: What causes mountains and earthquakes? How do beaches get their shape? and Why do beaches change with the seasons?

At his job right now, Brad is doing research about the shapes of beaches and how each beach changes from season to season and from year to year.

Brad thinks that geology is fun, important, and exciting.

INTERVIEW WITH GABY AND JANE: Earth's natural beauty

LISTENING FOR DETAILS

Answers to step 2 (Student's Book page 8)

Main ideas	Details	
	Grand Canyon	**Uluru (Ayers Rock)**
What it looks like	big – seems to go on forever cliffs go down into earth	*large red rock, middle of plain far away looks smooth* *up close rough + has holes*
Its colors	*red, blue, purple, orange, yellow, brown*	reddish-brown can change depending on time to pink, purple, or gray
The speakers' thoughts and feelings	one of the most beautiful things ever seen lucky to experience it humans cannot create this	*thinks it's beautiful*
How it was formed	*water flowing over rock*	layers of rock lifted up from Earth softer rocks eroded – Uluru is what's left

Answers to step 3 will vary.

AFTER THE INTERVIEWS

CONSIDERING RELATED INFORMATION (Student's Book page 9)

Students' answers will vary.

3 IN YOUR OWN VOICE (Student's Book page 10)

CONDUCTING RESEARCH

A sample student presentation

I'd like to tell you about the Grand Canyon, a famous natural landmark in the United States. The Grand Canyon is very big. It is almost 450 kilometers long, 24 kilometers wide, and more than 1.6 kilometers deep at its deepest point. It was formed more than 6 million years ago by the Colorado River. The river cut through the land to form the canyon. A lot of rain and ice also wore away the earth and made the canyon bigger. This process is called *erosion* and took millions of years.

The Grand Canyon is famous for many reasons. First, it is famous for its great size. Second, it is famous for its beautiful scenery. Finally, it is famous because geologists can study the layers of the Earth in the walls of the Grand Canyon. For all of these reasons, millions of people visit the Grand Canyon every year.

4 ACADEMIC LISTENING AND NOTE TAKING: The Internal Structure of Earth (Student's Book pages 11–17)

BEFORE THE LECTURE

LISTENING FOR MAIN IDEAS IN A LECTURE

Answers to step 1 (Student's Book page 11)
2, 1, 4, T, 3

NOTE TAKING: ORGANIZING YOUR NOTES IN AN OUTLINE

Answers to step 1 (Student's Book page 12)

The Internal Structure of Earth (lecture topic)

I. Background information (main idea)
II. Crust = Earth's surface layer (main idea)
  A. oceanic (subtopic)
  B. continental (subtopic)
III. Mantle = next layer down from crust (main idea)
IV. Core = center of Earth (main idea)
  A. outer core (subtopic)
  B. inner core (subtopic)

Answers to step 2 (Student's Book page 12)
There are four main ideas in the lecture. Two main ideas have subtopics.

LECTURE, PART ONE: Background Information About Our Planet

GUESSING VOCABULARY FROM CONTEXT

Answers to step 2 (Student's Book page 13)
1 b, **2** f, **3** h, **4** c, **5** a, **6** e, **7** g, **8** d

NOTE TAKING: LISTENING FOR SUPPORTING DETAILS

Answers to step 3 (Student's Book page 14)

The Internal Structure of Earth

I. Background information
  4.6 billion years old
  3rd planet from sun
  5th largest planet in solar system
  only planet with liquid water – 71% of surface is covered
  distance from north pole to south pole = about 13,000 kilometers
  densest planet
  Earth's 3 main layers: crust, mantle, core
  seismic waves (vibrations) give information about Earth's layers

LECTURE, PART TWO: Earth's Internal Structure

GUESSING VOCABULARY FROM CONTEXT

Answers to step 2 (Student's Book page 15)
1 f, **2** e, **3** d, **4** c, **5** a, **6** b

NOTE TAKING: LISTENING FOR SUPPORTING DETAILS

Sample answers to step 2 (Student's Book page 16)

II. Crust = Earth's surface layer
  A. oceanic
    under water
    6–11 kilometers thick
  B. continental
    land areas
    thicker than oceanic crust (30–40 kilometers)
    movement causes earthquakes, mountains, valleys

III. Mantle = next layer down from crust
  much thicker than crust (2,900 kilometers deep)
  much denser than crust
  most of Earth's mass
  upper – cool, solid rock
  lower – hot and soft

IV. Core = center of Earth
  thicker than the mantle
  A. outer core
    extremely hot – rocks and minerals melt
  B. inner core
    ball of high-pressure material
    solid iron and nickel
    temperatures up to 4,000˚C

NOTE TAKING: CLARIFYING YOUR NOTES WITH A PARTNER

(Student's Book page 16)

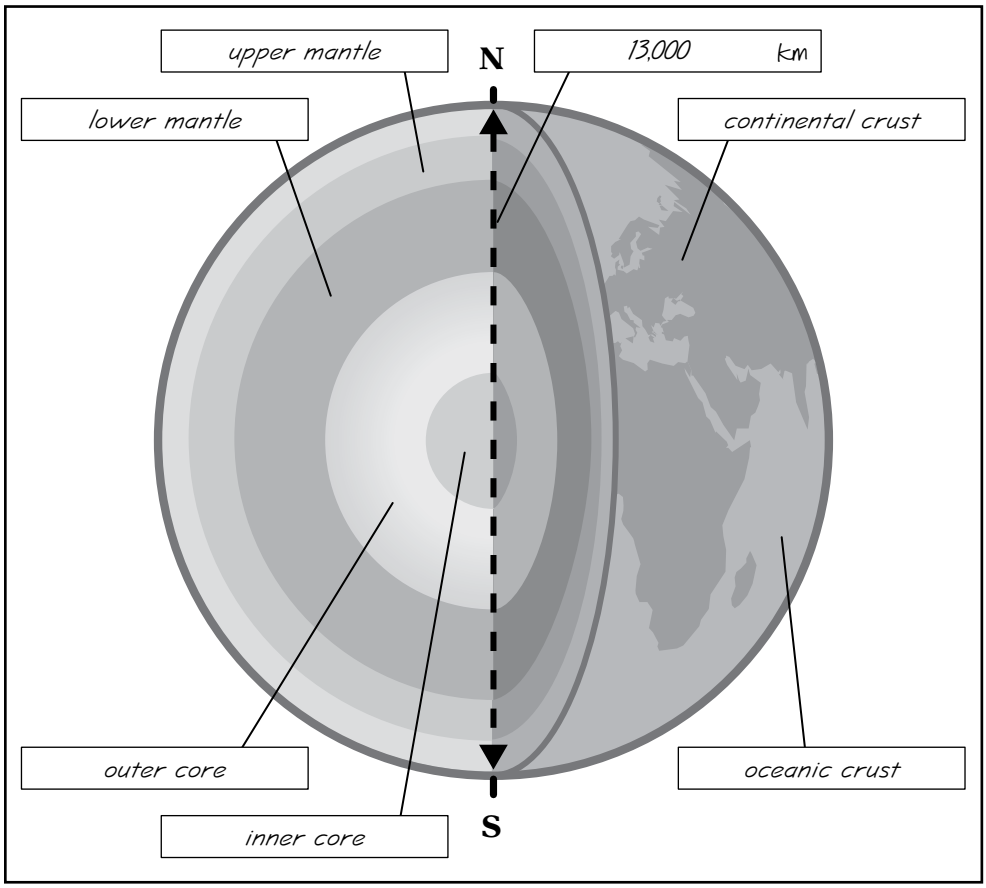
Students' answers will vary.

AFTER THE LECTURE

USING YOUR NOTES TO LABEL AN ILLUSTRATION

Answers to step 1 (Student's Book page 17)

Students should label the illustration as follows:



Chapter 1 Lecture Quiz

See the Lecture Quiz section at the back of this Teacher's Manual for a photocopiable quiz on the lecture for Chapter 1. Quiz answers can be found on page 113.