**SUMMARY** This nonfiction reader describes some of the different devices used to measure various land forms. For example, the book explains how satellites are used to measure the heights of mountains and how sonar is used to measure the depths of the oceans.

**LESSON VOCABULARY**
- average
- depth
- deserts
- erupted
- outrun
- peak
- tides
- waterfalls

**INTRODUCE THE BOOK**

**INTRODUCE THE TITLE AND AUTHOR** Discuss with students the title and the author of *Measuring the Earth*. Based on the picture on the cover, have students suggest what types of land they think the book will be about. Then invite students to make educated guesses about what the title means.

**BUILD BACKGROUND** Have students brainstorm answers to the following questions:
- How do you think people measure the height of mountains? How do you think people measure the depth of the ocean? *(Responses will vary.)* Explain that *Measuring the Earth* is a book about how people measure land forms. Have students suggest other questions they have about measuring features of Earth’s surface.

**PREVIEW/USE TEXT FEATURES** Tell students to look through the book, paying special attention to the section headings. Ask: What types of land forms and measurements does this book talk about? *(heights of mountains, depths of oceans, directions, earthquakes, minerals)*

**READ THE BOOK**

**SET PURPOSE** Remind students that usually the main purpose of a nonfiction text is to inform the reader about a topic. Have students think about the headings in the book and set a purpose for reading by completing the following statement: *I would like to read this book to learn more about __________.*

**STRATEGY SUPPORT: IMPORTANT IDEAS** Tell students that when they read, it helps to locate the important ideas in a story. Remind students that an author can organize text in a story so that the important ideas are easier to find through text structures or signal words and phrases. Ask students to look at how the text is organized as they read. *(by description and text structure)*

**COMPREHENSION QUESTIONS**

**PAGE 5** Is the height of Mount Everest a fact or an opinion? How do you know? *(fact; it can be proved true or false)*

**PAGE 7** What question could you ask that is answered on this page? *(Possible response: How do scientists measure the depth of the ocean?)*

**PAGE 11** How do scientists find the exact location of an earthquake? *(measure the earthquake’s distance from three cities that use seismographs)*

**PAGES 12-13** Use the Mohs scale to compare and contrast quartz and topaz. How are these minerals alike? How are they different? *(Possible responses: They are alike because they are both harder than feldspar; they are different because quartz is softer than topaz.)*
**REVISIT THE BOOK**

**READER RESPONSE**

1. Possible response: It shows how hard minerals are in relation to other minerals.
2. Possible response: I learned how to measure the depth of the ocean. This can help with underwater explorations.
3. page 8: outrun; page 9: waterfalls
4. Responses will vary but might include the Internet, an encyclopedia, or nonfiction reference book.

**EXTEND UNDERSTANDING** Remind students that when they compare two or more things, they are describing how those things are alike. When they contrast those things, they are talking only about how they are different. Have students choose two measuring devices from the book to compare and contrast. Then have students think about how these devices are alike and different.

**ELL** Help students complete a Venn diagram to compare two of the measuring devices in the book.

**RESPONSE OPTIONS**

**WRITING** Invite students to think of another measuring device that people use, such as a thermometer, scale, ruler, or measuring cup. Have students write a paragraph in which they compare and contrast their measuring device with one of the devices in the selection. Remind students to think of all the features that the two devices have in common and the features that are different.

**SCIENCE CONNECTION**

Provide groups of students with topographical maps of places around the world. Have each group think of five questions to ask other groups about their maps. Then have students exchange maps and try to answer another group’s questions. Remind each group that it needs to provide answers to its questions.

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**Skill Work**

**TEACH/REVISE VOCABULARY**

Read through the Glossary with students. Pair students for a game called “10 Tries.” Have one student draw on a piece of paper the number of blanks that correspond to letters in one of the vocabulary words and write the definition beneath the blanks. The partner tries to guess the word by guessing letters. The goal is to guess the word before 10 tries are exhausted. Partners should take turns choosing a word and guessing.

**TARGET SKILL AND STRATEGY**

- **GRAPHIC SOURCES** Point out that authors often use graphic sources, like charts, graphs, and maps, to help the reader understand information in the text. Review with students the graphic sources on pages 10, 11, and 12. Discuss with students how these graphics helped them understand how seismographs and the Mohs Scale work.

- **IMPORTANT IDEAS** Remind students that authors have many important ideas in a story. Explain that understanding which ideas are important will help the students better understand the story and the authors purpose for writing.

**ADDITIONAL SKILL INSTRUCTION**

**FACT AND OPINION** Review with students that facts are statements that can be proved true or false, while opinions are statements that tell someone’s feelings or ideas about something. Discuss with students ways that facts may be proved true or false (checking in books, observing, asking experts). Point out some clue words that often indicate opinions, such as best, worst, most, always, should. Invite students to look for examples of one fact and one opinion as they read.
Graphic Sources

- **Graphic sources** are tools that present information visually.
- Charts, graphs, diagrams, maps, and pictures with captions are examples of **graphics sources**.

**Directions** Look back at the graphic sources in *Measuring Planet Earth* and answer the questions below.

1. Look at the illustration on page 10. Where do many earthquakes occur?

2. What does the chart on pages 12–13 tell you about the mineral gypsum?

3. Using the chart on pages 12–13, name two minerals that are harder than topaz.

4. **Directions** Create a bar graph that shows the heights of the following mountains:
   - Mount St. Helens 8,365 feet
   - Pike’s Peak 14,115 feet
   - Mount Everest 29,035 feet

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<th>Feet</th>
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<tr>
<td>Pike’s Peak</td>
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<tr>
<td>Mount St. Helens</td>
<td>20,000</td>
</tr>
<tr>
<td>Mt. Everest</td>
<td>25,000</td>
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feet
Vocabulary

Directions Write the word from the word box that best matches each clue.

Check the Words You Know

| ___average | ___depth | ___deserts | ___erupted |
| ___outrun | ___peak | ___tides | ___waterfalls |

1. streams of water that fall from high places
2. places where many trees do not grow
3. the highest place on a mountain
4. the moon and the sun cause these
5. to move faster than something else
6. burst out violently

Directions Write the word or words from the box above that best fit each category.

7. Plural nouns

8. Verbs

9. Words about water

10. Words about measuring

11. Things that move