Science A–Z
NONFICTION BOOK TEACHER'S GUIDE

CHANGING LANDFORMS

Earth's Changing Face

INTRODUCTION

This book is available at three reading levels, as indicated by the one, two, or three dots beside the Science A–Z logo on the front cover.

This guide offers general instructions that can be used with any or all of the multilevel books. When appropriate, tips are provided for modifying the instruction for a specific level. The dots in this guide indicate elements of the instruction that are only applicable to certain book levels.

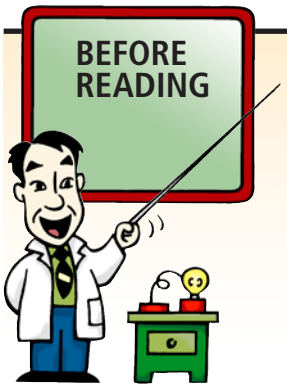
- • can only be used with low level
- ⁝ can only be used with middle level
- ⋮ can be used with high level
- •|⁝ can be used with low and middle levels
- ⁝|⋮ can be used with middle and high levels
- •|⁝|⋮ can be used with all three levels

Each book is available for printing or projecting and is also available as an eBook for students to access on Kids A–Z. The *Nonfiction Books* and their accompanying quizzes are available in both English and Spanish.

BOOK SUMMARY

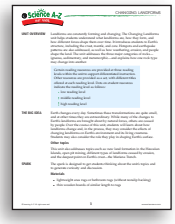
The book *Earth's Changing Face* explores some of the many ways our physical planet changes. It begins by describing Earth's layers—the crust, mantle, and core. Then the book addresses plate tectonics and how landforms on Earth's surface are formed. Next, the book details ways that landforms change—sometimes very gradually and sometimes quickly—such as by weathering, erosion, and human activity. Finally, the book explains how rocks can change from one type to another during the rock cycle.

Labeled photographs and diagrams support the text.



Preview the book title, cover, and table of contents with students. Ask them to predict what the book will be about. Invite students to preview the remainder of the book, looking at the images, captions, and special features as well as the section heads and the glossary. Encourage them to use this information to continually make and revise their predictions while reading.

Vocabulary



Instruction for the unit's vocabulary terms can be found in the *Unit Guide*. It defines core and other key science terms and suggests resources you can use to teach vocabulary before, during, or after the reading.

These terms are found in the glossary of all three book levels.

continents	**core**	**crust**
erosion	**igneous rock**	**landforms**
magma	**mantle**	**metamorphic rock**
plate tectonics	**plates**	**rock cycle**
sedimentary rock	**volcano**	**weathering**

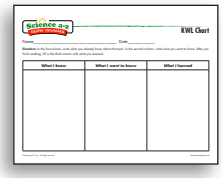
Reading Strategy

Connect to Prior Knowledge

The book *Earth's Changing Face* introduces content and vocabulary that may be new to students. Connecting the content to students' own experiences helps them personalize and remember new information. Invite students to briefly tell the class about landforms (such as mountains, canyons, valleys, sand dunes, and cliffs) they have seen in person, whether in their local area or on vacations. Have them explain what each landform looked like and describe any special features of the landform.

Explain to students that they will be reading about different kinds of landforms and learning how landforms form and change. Ask students what they know or think they know about each of the main topics in the book—Earth's layers, how landforms form, how landforms change, and the three main categories of rocks. Then explain why it can be helpful to connect to prior knowledge.

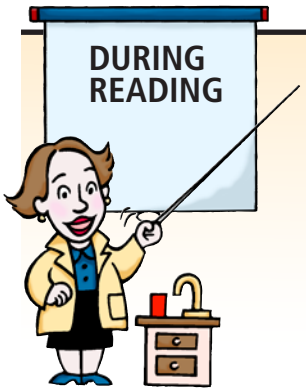
> **Think-aloud:** *Before I start to read, it helps me to consider what I already know about the topics in the book. I find I want to learn more about those topics. I get more excited to read the book, and I usually remember more of what I have read once I finish.*



Download and print the *KWL Graphic Organizer*. Introduce it and have students complete the first column with things they know about landforms. Then have them write questions in the second column about what they want to know about landforms. Prepare students to fill in the third column with things they have learned after they finish the book.

TIP The *Graphic Organizer* can also be used with each of the *Quick Reads* or other unit resources.

As students read, they should use other reading strategies in addition to connecting to prior knowledge.



The book begins with a short story about someone who was affected by a volcanic eruption. After students read this section, you may want to check for understanding by having them explain how the person knew a volcano had erupted. Then ask students to share what they know about volcanoes to further connect to their prior knowledge about landforms.

Review the key science terms in each section before students read. Encourage students to read one section at a time and then discuss in pairs, in groups, or as a class what they read. (See *Discussion Questions*.)

Students can read the special features of the book to build on the concepts within each section. Some vocabulary terms can be reinforced in these features.

Comprehension Skill Focus

Main Idea and Details

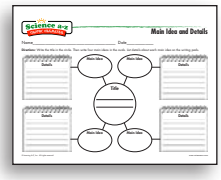
Explain to students that most books they read have one overall main idea, which is the most important thing they should understand about the book as a whole. Many books also have sections that explain more about the book's main idea. This is true for the book *Earth's Changing Face.* Each section of this book also has a main idea.

Guide students through the book to locate these four sections: Earth's Structure, Forces That Create Landforms, Forces That Shape Landforms, and The Rock Cycle. Encourage students to predict the main idea of each section by using picture clues and by scanning the text. Explain that each section of a book often contains a topic sentence that introduces the main idea. Then the rest of the section provides details, or important facts about the main idea. Note that the first sentence does not always identify the main idea. They need to read the section to identify the main idea.

Read the section titled Earth's Structure with students. Then ask students to identify details from the text and review how these are related to the main idea. Encourage students to use the subheadings to organize the information into three categories: the crust, the mantle, and the core.

> **Think-aloud:** *This section began with a topic sentence:*
>
> To understand Earth's surface, you have to look deep inside it.
>
> *This sentence told us the main idea of the section. By reading the section head and the topic sentence, we knew we would be reading more about the structure of Earth and how it affects the surface. To learn more about this main idea, we read on and found details that told us about the main idea.*

Encourage students to continue identifying main ideas and details as they read the remaining sections of the book. After completing the book, ask students to review the main idea of the entire book.



Download and print the *Main Idea and Details Graphic Organizer.* Have students write Earth's Changing Face in the central circle as the title of the book. In the ovals, have them fill in the main idea from each of the four main sections of the book. On the writing pads, have them list details from each section.

TIP The *Graphic Organizer* can also be used with each of the *Quick Reads* or other unit resources.

As students read, they should use other comprehension skills in addition to main idea and details.

Discussion Questions

Use the *Discussion Cards* during or after reading. The cards are structured so they can be used for whole-group discussion or assigned to individuals, pairs, or groups. Choose the activity that best serves your purposes. It may be helpful to allow students to use their book and completed *Graphic Organizer(s)* as they try to answer the questions. Here are some suggested activities:

- Divide the class into groups and have each group discuss the questions from a section of the book. Then have groups report their responses to the class.
- Have all groups discuss all the questions and then discuss the similarities and differences among the groups' answers.
- Place discussion cards at centers and have groups talk about or write their responses as they rotate through them.
- Have each student choose a card and write an answer on the back. Collect the cards and review them with the whole class.
- Assign certain questions to groups or individuals for homework.

Each question can be answered with certain book levels, as noted with dots in the upper left corner. You may want all students to think about all the questions, even if their book level is not noted on certain cards. The book section or topic most closely related to the question appears on each card. Question types are noted in parentheses.

All questions can be answered with all three book levels except where noted.

Introduction

- What is a *volcano?* (remembering)
- What is the purpose of the Mount Redoubt story in the introduction? (understanding)
- Where is the nearest volcano to where you live? (applying)

Earth's Structure

- What are the three main layers of Earth? (remembering)
- How do scientists think Earth formed, and how long ago do they believe this took place? (remembering)
- On which layer of Earth do you live? (applying)
- Which layer makes up most of our planet? (remembering)
- Which layer of Earth is the hottest, and why is it the hottest? (understanding)
- How is Earth similar to and different from a hard-boiled egg? (analyzing)
- What kind of fruit would you compare to Earth? Why? (creating)
- If you could safely travel deep inside Earth, where would you go? Why? (evaluating)

Forces That Create Landforms

- How long can it take for landforms to form? (understanding)
- Which kind of landform shown in the book is your favorite? Why? (evaluating)
- Which kind of Earth's plates is heavier and which is lighter? (remembering)
- If continental plates were like boats, which layer of Earth would be like the water? (creating)
- What does temperature have to do with how landforms form? (understanding)
- How would you explain the difference between the ways that mountains and ocean trenches form? (analyzing)
- How would Earth be different if its plates did not move? (creating)
- Why might people consider small earthquakes to be good things? (understanding)
- How do you think the landforms near where you live formed? (applying)

Forces That Shape Landforms

- How long can it take for landforms to change? (understanding)
- How can large rocks turn into tiny grains of sand? (understanding)
- Which kind of weather do you think would cause landforms to weather the fastest? Why? (analyzing)
- What forces helped form the Grand Canyon? (remembering)

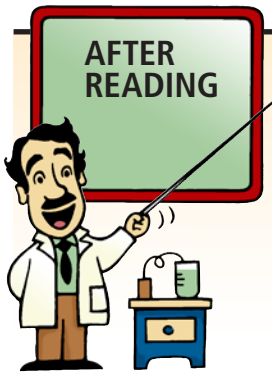
- What impact do glaciers have on Earth's surface? (understanding)
- Should people do anything differently to reduce erosion and other changes to landforms? (evaluating)
- Why do many hiking trails have signs asking people to stay on the trail? (applying)
- How do you think the landforms near where you live have changed over time? (applying)

The Rock Cycle

- What are the three main types of rocks? (remembering)
- Which rock type forms when small particles are deposited by water or wind? (remembering)
- Which rock type changes from one type to another due to pressure? (remembering)
- Which rock type forms when hot, liquid rocks cool off at or near Earth's surface? (remembering)
- Why might some rocks be easier to break apart than others? (analyzing)
- Why are some igneous rocks smooth and others are lumpy? (understanding)
- How can fossils be used to learn about Earth's history? (understanding)
- Are the bottom or top layers of a sedimentary landform more likely to be oldest (deposited first)? (analyzing)
- Is a landform made of igneous, sedimentary, or metamorphic rock likely to be affected most by weathering? Why? (analyzing)

Conclusion

- What are some changes to Earth that you can see because they happen quickly? (applying)
- What are some changes to Earth that you cannot see because they happen very slowly? (applying)
- Do you think other planets are changing as much, or more than, Earth? How could we find out? (creating)



Encourage students to reread the book.

Reflect on the Reading Strategy: *Connect to Prior Knowledge*

Review the strategy of connecting to prior knowledge. Invite students to share how this strategy helped them understand what they read.

Enduring Understanding

In this book, students have read about Earth's structure, how landforms form and change, and three categories of rocks. Discuss the following with students:

- *How might Earth's landforms change during your lifetime, and how might they change long into the future?*

Home Project

Have students and their families build an outdoor model of a particular type of landform (such as a mountain, canyon, mesa, sand dune, or cliff). Then encourage them to subject their model to various forces that are known to shape landforms (for example, water, wind, plants, and human activity) and observe the consequences over several days. Invite students to take pictures of their model before, during, and after the changes. Finally, ask students to share their project with the class in the form of a poster, digital slideshow, and/or oral presentation.

Assess

Download and print the appropriate reading level and language of the *Book Quiz* or have the student take the eQuiz on **Kids A-Z**.

Use the *Nonfiction Retelling Rubric* to assess understanding.

Quick Check: For individual or group assessment, have students respond orally or in writing to the following question:

- *What is one way landforms can form and one way landforms can change?*