About the Consultant

Douglas Fisher, Ph.D., is a Professor in the Department of Teacher Education at San Diego State University. He is the recipient of an International Reading Association Celebrate Literacy Award as well as a Christa McAuliffe award for Excellence in Teacher Education. He has published numerous articles on reading and literacy, differentiated instruction, and curriculum design as well as books, such as *Improving Adolescent Literacy: Strategies at Work* and *Responsive Curriculum Design in Secondary Schools: Meeting the Diverse Needs of Students*. He has taught a variety of courses in SDSU’s teacher-credentialing program as well as graduate-level courses on English language development and literacy. He also has taught classes in English, writing, and literacy development to secondary school students.
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*The Changing Surface of Earth*
Note-Taking Tips

Your notes are a reminder of what you learned in class. Taking good notes can help you succeed in science. These tips will help you take better notes.

- Be an active listener. Listen for important concepts. Pay attention to words, examples, and/or diagrams your teacher emphasizes.
- Write your notes as clearly and concisely as possible. The following symbols and abbreviations may be helpful in your note-taking.

<table>
<thead>
<tr>
<th>Word or Phrase</th>
<th>Symbol or Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>for example</td>
<td>e.g.</td>
</tr>
<tr>
<td>such as</td>
<td>i.e.</td>
</tr>
<tr>
<td>with</td>
<td>w/</td>
</tr>
<tr>
<td>without</td>
<td>w/o</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Word or Phrase</th>
<th>Symbol or Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>and</td>
<td>+</td>
</tr>
<tr>
<td>approximately</td>
<td>≈</td>
</tr>
<tr>
<td>therefore</td>
<td>∴</td>
</tr>
<tr>
<td>versus</td>
<td>vs</td>
</tr>
</tbody>
</table>

- Use a symbol such as a star (★) or an asterisk (*) to emphasize important concepts. Place a question mark (?) next to anything that you do not understand.
- Ask questions and participate in class discussion.
- Draw and label pictures or diagrams to help clarify a concept.

Note-Taking Don’ts

- Don’t write every word. Concentrate on the main ideas and concepts.
- Don’t use someone else’s notes—they may not make sense.
- Don’t doodle. It distracts you from listening actively.
- Don’t lose focus or you will become lost in your note-taking.
Using Your Science Notebook

This note-taking guide is designed to help you succeed in learning science content. Each chapter includes:

Language-Based Activities
Activities cover the content in your science book including vocabulary, writing, note-taking, and problem solving.

Anticipation Guide/KWL Charts
Think about what you already know before beginning a lesson and identify what you would like to learn from reading.

Science Journal
Write about what you know.

Writing Activities
These activities help you think about what you’re learning and make connections to your life.

Vocabulary Development
Vocabulary words help you to better understand your science lessons. Learning the Academic Glossary can help you score higher on standardized tests.
Chapter Wrap-Up
This brings the information together for you. Revisiting what you thought at the beginning of the chapter provides another opportunity for you to discuss what you have learned.

Review Checklist
This list helps you assess what you have learned and prepare for your chapter tests.

Graphic Organizers
A variety of visual organizers help you to analyze and summarize information and remember content.

The Nature of Science Chapter Wrap-Up

Review
Use this checklist to help you study:

- Review the information you included in your Foldable.
- Review your Science Notebook on this chapter.
- Study the definitions of vocabulary words.
- Review daily homework assignments.
- Reread the chapter and review the charts, graphs, and illustrations.
- Review the Self Check at the end of each section.
- Look over the Chapter Review at the end of this chapter.

The Nature of Science After You Read

Summarize
This brings the information together for you. Revisiting what you thought at the beginning of the chapter provides another opportunity for you to discuss what you have learned.

Note-Taking Based on
the Cornell Two-Column Format
Practice effective note-taking through the use of graphic organizers, outlines, and written summaries.

The Nature of Science

Review Checklist
This list helps you assess what you have learned and prepare for your chapter tests.

Graphic Organizers
A variety of visual organizers help you to analyze and summarize information and remember content.

The Changing Surface of Earth
Views of Earth

Before You Read

Before you read the chapter, respond to these statements.

1. Write an A if you agree with the statement.
2. Write a D if you disagree with the statement.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Views of Earth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• All mountains form in the same way.</td>
</tr>
<tr>
<td></td>
<td>• Lines of longitude run parallel to the equator.</td>
</tr>
<tr>
<td></td>
<td>• All maps of Earth distort the shapes and sizes of landmasses.</td>
</tr>
</tbody>
</table>

FOLDABLES
Study Organizer

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Assume that you want to build a home and have a satellite photo to guide you. Describe where you would build your new home and why you would build at your chosen location.
Views of Earth
Section 1 Landforms

**Skim** the headings in Section 1. Write three questions that come to mind from reading these headings.

1. ____________________________
2. ____________________________
3. ____________________________

**Define** landform to show its scientific meaning.

**Review Vocabulary**

- landform

**New Vocabulary**

Write the vocabulary term that matches each definition.

- large, flat area, often found in the interior regions of continents
- flat, raised area of land made up of nearly horizontal rocks that have been uplifted by forces within Earth
- mountain in which rock layers are folded
- mountain formed when blocks of Earth’s crust are pushed up by forces inside Earth
- mountain made of huge, tilted blocks of rock separated from surrounding rock by faults
- mountain formed when molten material reaches the surface through a weak area of Earth’s crust

**Academic Vocabulary**

Use a dictionary to define expose.

**Name ___________________________________________ Date ________________**

2 Views of Earth
Main Idea

Plains

I found this information on page ____________.

Details

Distinguish two reasons that plains are useful for agriculture.

1. _____________________________________________

2. _____________________________________________

Compare and contrast coastal plains and interior plains.

<table>
<thead>
<tr>
<th>Coastal Plains</th>
<th>Interior Plains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td></td>
</tr>
<tr>
<td>Characteristics</td>
<td></td>
</tr>
</tbody>
</table>

Summarize key characteristics of the Great Plains.

The Great Plains are an example of a(n) _________________.

They are located ________________________________ ________________. The area is ________________, and covered with ________________. The Great Plains are made of ________________________________.

Compare and contrast plains and plateaus. Complete the Venn diagram with at least three facts.

Plateaus  Both  Plains

I found this information on page ____________.
Main Idea

Mountains

I found this information on page _________.

Details

Model the four types of mountains. Draw a diagram of each type.

Folded Mountain

Upwarped Mountain

Fault-Block Mountain

Volcanic Mountain

Summarize how mountains form. Give an example of each.

Folded Mountain:

Upwarped Mountain:

Fault-Block Mountain:

Volcanic Mountain:

Connect It

Use a physical map to identify the landforms in your area.
**Views of Earth**

**Section 2 Viewpoints**

---

**Preview** the What You’ll Learn statements for Section 2. Predict three topics that will be discussed in this section.

1. ____________________________________
2. ____________________________________
3. ____________________________________

**Review Vocabulary**

Define pole as it is used when describing Earth.

pole

---

**New Vocabulary**

Define each vocabulary term.

equator

latitude

prime meridian

longitude

---

**Academic Vocabulary**

Use a dictionary to define parallel as an adjective. Then find a sentence in Section 2 that contains the term.

parallel

---
Model the system used to measure position on Earth.

• Draw a view of Earth.
• Label important features on the diagram with the following terms.

| equator | prime meridian | 90°S latitude |
| north pole | 0° latitude | 90°N latitude |
| south pole |

Summarize how latitude and longitude are measured.

Latitude is measured ________________________________
______________________________

Longitude is measured ________________________________

______________________________

Degrees of latitude and longitude are divided into ________________
and ________________.
Look at the map of time zones in your book. Infer why the International Date Line does not follow the 180° meridian exactly.

__________________________________________

__________________________________________

__________________________________________

__________________________________________
Scan the section headings, bold words, and illustrations. Write two facts that you discovered as you scanned the section.

1. ____________________________
2. ____________________________

Define globe to show its scientific meaning.

globe

Use your book to define each vocabulary term.

conic projection

topographic map

contour line

map scale

map legend

Use a dictionary to define physical. Use physical in a sentence to show its scientific meaning.

physical
Define map. Then complete the statements below about map projections.

A map is _________________________________.

A map projection is made when _________________________________.

All map projections ______________ the shapes and sizes of landmasses to some extent.

Compare and contrast Mercator, Robinson, and conic projections.

<table>
<thead>
<tr>
<th>Mercator</th>
<th>Robinson</th>
<th>Conic</th>
</tr>
</thead>
<tbody>
<tr>
<td>How is it made?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What does it show accurately?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How is it used?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize the purpose of a topographic map.

__________________________________________________________________________________________

__________________________________________________________________________________________

__________________________________________________________________________________________

__________________________________________________________________________________________
If you were going to map your classroom, which map scale would be better: 1 cm:1 m or 1 cm: 10 m? Explain your reasoning.

Accept all reasonable responses. I would use a scale of 1 cm:1 m. This way, I can show small features such as a desk or chair more clearly.

Organize information about contour lines in the concept web.

Summarize what a map scale and map legend show.

Map Elements

Contour Lines

Map Scale

Map Legend

Summarize what geologic maps are and how they are used.

Geologic Maps

I found this information on page _________.

I found this information on page _________.

I found this information on page _________.

 CONNECT IT

Views of Earth
Create a two-dimension physical map of your state in the space provided below. Include the major landforms found in your state. Use symbols to indicate these landforms on the map. Be sure to explain the symbols you use in a map legend. Your map should be proportional to the actual size of your state. Include a map scale to help others determine distances.
Views of Earth  Chapter Wrap-Up

Now that you have read the chapter, think about what you have learned and complete the table below. Compare your previous answers with these.

1. Write an A if you agree with the statement.
2. Write a D if you disagree with the statement.

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</tr>
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Review

Use this checklist to help you study.

☐ Review the information you included in your Foldable.
☐ Study your Science Notebook on this chapter.
☐ Study the definitions of vocabulary words.
☐ Review daily homework assignments.
☐ Re-read the chapter and review the charts, graphs, and illustrations.
☐ Review the Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

Identify three important ideas in this chapter.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Weathering and Soil

Before You Read

Before you read the chapter, respond to these statements.

1. Write an A if you agree with the statement.
2. Write a D if you disagree with the statement.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Weathering and Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants can break apart rock.</td>
<td></td>
</tr>
<tr>
<td>Climate affects the rate at which soil forms.</td>
<td></td>
</tr>
<tr>
<td>Soil on steep slopes tends to be thicker than soil at the bottom of a slope.</td>
<td></td>
</tr>
<tr>
<td>Humans sometimes cause erosion to occur faster than new soil can form.</td>
<td></td>
</tr>
</tbody>
</table>

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

A tor is a pile of boulders left on land after the surrounding, weakened rock is worn away. Write a poem about a tor. Use words in your poem that rhyme with the word tor.

---

Standing above the English moor;
Remnant of a landscape past.
The granite boulders of a tor;
Survivors of nature’s wrath.
Subject of myth and lore;
All that remains is weathered core.

Poems will vary.
Weathering and Soil
Section 1 Weathering

Scan the headings of Section 1 to determine two main types of weathering that will be discussed.

1. ________________________________
2. ________________________________

Define surface area, and use it in a scientific sentence.

_________________________________
_________________________________
_________________________________
_________________________________

Read the definitions below. Write the key term on the blank in the left column.

surface processes that break rock into smaller and smaller pieces
physical processes that break rock apart without changing its chemical makeup
mechanical weathering process that occurs when water freezes in the cracks in rock and expands
process in which chemical reactions dissolve the minerals in rock or change them into different minerals
chemical weathering process that occurs as minerals are exposed to air and water
the long-term pattern of weather that occurs in a particular area

Use a dictionary to define the term process as a noun.

_________________________________
_________________________________
Main Idea

Weathering and Its Effects
I found this information on page  

Mechanical Weathering
I found this information on page  

Details

Sequence the sediment grain types in order of size.

Coarsest  Finest

Organize information by completing the outline below as you read.

Mechanical Weathering

I. Plants and Animals
A.  
B.  

II. Ice Wedging
A.  
B.  
C.  

III. Surface Area
A.  
B.  
C.  

Main Idea

Chemical Weathering

I found this information on page _________.

Details

Sequence steps to explain how carbon dioxide causes chemical weathering.

<table>
<thead>
<tr>
<th>Chemical Weathering by Carbonic Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
</tbody>
</table>

Synthesize the effects of climate and rock type on the rate of weathering in the table below.

<table>
<thead>
<tr>
<th>Factors that Affect the Rate of Weathering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor</td>
</tr>
<tr>
<td>climate</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>rock type</td>
</tr>
</tbody>
</table>

Analyze how oxygen can cause chemical weathering. Discuss where you have seen oxidation around your home.

________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________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Weathering and Soil
Section 2 The Nature of Soil

Predict two things that might be discussed in this section on the basis of its title.
1. ______________________________________________________
2. ______________________________________________________

Define the term profile.

profile

New Vocabulary

Use your book or a dictionary to define the following terms.

soil

humus

horizon

soil profile

litter

leaching

Academic Vocabulary

Use a dictionary to define indicate.

indicate

Review Vocabulary

Name ___________________________ Date ________________

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Complete the graphic organizer to show the five factors that affect soil formation.

Factors Affecting Soil Formation

Identify the five components of soil, and create a symbol to represent each.

Compare and contrast dry soil and moist soil. Create sketches in the top row, and write descriptions in the bottom row.

<table>
<thead>
<tr>
<th>Component of Soil</th>
<th>My Soil Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dry Soil</th>
<th>Moist Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 2 The Nature of Soil (continued)

Main Idea

Soil Profile

Model a soil profile by drawing and labeling it below.

Organize information about soil structure in the concept map.

Summarize information about how soil varies in different regions.

Soil Types

Connect It

Weathering and Soil 19
Weathering and Soil
Section 3 Soil Erosion

Skim the headings and the boldfaced terms in Section 3. Identify three facts about soil erosion and ways to reduce its occurrence.

1. ________________________________
2. ________________________________
3. ________________________________

Review Vocabulary

Use erosion in a scientific sentence.

Use erosion in a scientific sentence.

Define the following terms. Then use each term in an original scientific sentence.

Define the following terms. Then use each term in an original scientific sentence.

no-till farming

define the term compensate as it refers to soil.
Evaluate why soil erosion is a serious problem for agriculture.

Organize information on the causes and effects of soil erosion by completing the diagram below.

Identify the causes and effects of excess sediment.
### Preventing Soil Erosion

**Main Idea**

I found this information on page _______.

**Details**

**Summarize** methods of preventing soil erosion.

<table>
<thead>
<tr>
<th>Preventing Soil Erosion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategy</strong></td>
</tr>
<tr>
<td>Manage crops</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Reduce erosion on slopes</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Reduce erosion on exposed soil</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**CONNECT IT**

Identify ways to prevent erosion that are probably used in your community and explain why they are used.

---

Weathering and Soil 22
Tie It Together

Model

*Recall evidence of erosion that you have seen in your community. Then create a model to demonstrate how the erosion probably occurred. You may make a working three-dimensional model that you can demonstrate for the class. You may represent your model with a labeled drawing. Describe how the model can be changed to prevent erosion.*
Weathering and Soil  Chapter Wrap-Up

Now that you have read the chapter, think about what you have learned and complete the table below. Compare your previous answers with these.

1. Write an A if you agree with the statement.
2. Write a D if you disagree with the statement.

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<tr>
<td>Plants can break apart rock.</td>
<td></td>
</tr>
<tr>
<td>Climate affects the rate at which soil forms.</td>
<td></td>
</tr>
<tr>
<td>Soil on steep slopes usually is thicker than soil at the bottom of a slope.</td>
<td></td>
</tr>
<tr>
<td>Humans sometimes cause erosion to occur faster than new soil can form.</td>
<td></td>
</tr>
</tbody>
</table>

Review

Use this checklist to help you study.

☐ Review the information you included in your Foldable.
☐ Study your Science Notebook on this chapter.
☐ Study the definitions of vocabulary words.
☐ Review daily homework assignments.
☐ Re-read the chapter and review the charts, graphs, and illustrations.
☐ Review the Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three things that you have learned about weathering and soil.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Erosional Forces

Preview

*Before you read the chapter, respond to these statements.*

1. Write an **A** if you agree with the statement.
2. Write a **D** if you disagree with the statement.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Erosional Forces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Glaciers can erode rocks and soil.</td>
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</tr>
<tr>
<td></td>
<td>• Planting vegetation can increase erosion.</td>
</tr>
</tbody>
</table>

**Foldables**

Construct the Foldable as directed at the beginning of this chapter.

**Science Journal**

Name three major landforms around the world. Hypothesize what erosional forces helped shape them. Use sketches to help you think about the processes.
Erosional Forces
Section 1 Erosion by Gravity

Predict what you will learn about erosion after looking at each illustration in Section 1 of your book.

Review Vocabulary
Write a sentence using the word sediment to show its scientific meaning.

sediment

New Vocabulary
Define the following key terms by using your book or a dictionary.

erosion

deposition

mass movement

slump

creep

Academic Vocabulary
Use a dictionary to define the word structure.

structure
Identify four major agents of erosion.

1. Gravity
2. Water
3. Wind
4. Glaciers

Summarize how energy affects the ability of agents of erosion to carry and drop sediment. Then describe how this occurs with water.

Water:

Compare and contrast characteristics of mass movements by completing the following chart.

<table>
<thead>
<tr>
<th>Mass Movements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types</td>
</tr>
<tr>
<td>Slump</td>
</tr>
<tr>
<td>Rock slide</td>
</tr>
<tr>
<td>Creep</td>
</tr>
</tbody>
</table>
Main Idea

Model what a slope would look like before and after a mudflow.

Before

After

Details

Consequences of Erosion

I found this information on page ___________.

Analyze ways to reduce erosion on steep slopes. Complete the graphic organizer below.

Ways to reduce erosion on steep slopes

COMPARE IT

Model a way to build a house on a hillside. Draw the house and show methods to protect the house from erosion caused by gravity.
Scan the illustration headings in Section 2. Write three true statements about glaciers on the lines below.

- Glacier is a large mass of ice and snow moving on land under its own weight.
- Eskers are glacial deposits formed by meltwater.
- Glacial erosion and deposition created many landforms on Earth.

Define plasticlike using your book.

plasticlike

Write a scientific sentence for each vocabulary word.

- Glacier formed as snow and ice accumulated over many hundreds of years.
- Plucking caused rocks to accumulate in the ice at the bottom of the glacier.
- Some farmland in the Midwest is made up of till that was left behind when glaciers retreated.
- Material piled up at the end of the glacier, forming a moraine.
- The meltwater from the glacier deposited a fan-shaped outwash deposit.

Define accumulate by using a dictionary.

accumulate
### Main Idea

**How Glaciers Form and Move**

I found this information on page __________.

### Details

**Sequence** the steps of glacier formation and movement. The first step has been completed for you.

1. When snow doesn't melt, it piles up.
2. ____________________________
3. ____________________________
4. ____________________________

**Contrast** two ways that glaciers erode rock.

### Ice Eroding Rock

I found this information on page __________.

### Ice Depositing Sediment

I found this information on page __________.

### Summary

**Summarize** the types of glacier deposits in the chart below.

<table>
<thead>
<tr>
<th>Mass Movements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Till</td>
</tr>
<tr>
<td>Outwash</td>
</tr>
</tbody>
</table>
Main Idea

Continental Glaciers

I found this information on page ____________.

Valley Glaciers

I found this information on page ____________.

Details

Identify key facts about continental glaciers. Complete the concept map below.

<table>
<thead>
<tr>
<th>Description</th>
<th>Location Today</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Create a labeled diagram of a mountain that has been eroded by valley glaciers.

SYNTHESIZE IT

Outside of a town in the Midwest is a long, winding ridge made of sand and gravel. Hypothesize how this landform may have formed.

Accept all reasonable responses. This may be an esker created by a melting glacier.

A river may have formed in the melting ice, depositing sand and gravel in its channel.

When the glacier melted, a ridge of these deposits remained.
Erosional Forces
Section 3 Wind

**Skim** the headings in Section 3. Write three questions that occur to you.

1. ____________________________
2. ____________________________
3. ____________________________

**Define** friction using your book or a dictionary.

friction

when windblown sediment strikes rock, the surface of the rock gets scraped and worn away

wind-blown deposits of fine-grained sediments are called ____________________________

a mound of sand drifted by the wind.

wind removes small particles such as silt and sand and leaves behind heavier, coarser material.

**Write a sentence that shows the meaning of the word eventual.**

__________________________________________

__________________________________________
Contrast two ways wind differs from other agents of erosion.

1. Wind can pick up light, loose material. It usually cannot pick up heavy sediment.

2. Wind can deposit sediment over a larger area and thousands of kilometers away from the source.

Sequence deflation and abrasion in the flowchart. Make a sketch for the process that occurs in each box.

Contrast sandstorms and dust storms in the chart.

<table>
<thead>
<tr>
<th></th>
<th>Sandstorms</th>
<th>Dust Storms</th>
</tr>
</thead>
<tbody>
<tr>
<td>What particles are carried by the storm?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What happens?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summarize how plants help conserve soil. Make a sketch to show each effect in the boxes at right.

1. **Windbreaks:**
   - Prevent soil erosion. Trees reduce the energy of the wind. They also trap snow, which increases the level of moisture in the soil.

2. **Roots:**
   - Are shallow and slender and have many fibers. They twist and turn between soil particles and hold soil in place.

Complete the statements about loess and sand dunes.

Loess forms when wind blows across ____________. When the sediment is dropped, it forms _________________ deposits. Loess deposits often become _________ soils. Sand dunes often form in __________. After the dunes form, they move in the direction that the ________ blows. Sand blows up the _______ side of the dune. It then falls down the _______ side of the dune. This process causes the ________ to move slowly across the desert.

**SYNTHESIZE IT**

During the 1930s, wind eroded soil from much of the south-central United States (the Dust Bowl). Infer what farming practices might have contributed to the Dust Bowl. Summarize how farmers could have protected their farms.

<table>
<thead>
<tr>
<th>Infer farming practices that contributed to the Dust Bowl. Summarize how farmers could have protected their farms.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overgrazing and excess tilling contributed to the creation of the Dust Bowl. Farmers could have maintained ground cover to hold the soil in place and planted trees for windbreaks.</td>
</tr>
</tbody>
</table>
Imagine that you are a reporter for a newspaper. The town where you live is located near a moraine and along the shore of a large lake. Plan a series of two articles that will explain

i. how erosion and deposition shaped the town’s land

ii. what dangers the town may face from erosion in the future.

Article 1

Topic: Erosion and deposition and the town’s history

Headline: ____________________________

Key Points for Article:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Article 2

Topic: Mass wasting

Headline: ____________________________

Key Points for Article:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Now that you have read the chapter, think about what you have learned and complete the table below. Compare your previous answers with these.

1. Write an A if you agree with the statement.
2. Write a D if you disagree with the statement.

<table>
<thead>
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<th>Erosional Forces</th>
<th>After You Read</th>
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<td></td>
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☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three things that you have learned about erosional forces.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Erosional Forces  Chapter Wrap-Up
Before You Read

Before you read the chapter, respond to these statements.

1. Write an A if you agree with the statement.
2. Write a D if you disagree with the statement.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Water Erosion and Deposition</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td></td>
<td>Beaches are always made of pieces of rock.</td>
</tr>
</tbody>
</table>

Construct the Foldable as directed at the beginning of this chapter.

Hoodoos are narrow towers of rock. What processes might have formed hoodoos? What will happen if this process continues?
Skim Section 1 of your book and read the headings. Write three questions that come to mind. Try to answer your questions as you read.

1. ________________________________

2. ________________________________

3. ________________________________

Define erosion.

erosion

Write a paragraph that uses each vocabulary term in a way that shows its scientific meaning.

runoff

drainage basin

meander

Use your book or a dictionary to define likewise.

likewise
Main Idea

Runoff

Distinguish four factors that determine how much runoff occurs after rain falls.

Factors Affecting Runoff

<table>
<thead>
<tr>
<th>Type</th>
<th>Causes</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gully</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stream</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Water Erosion

Summarize the causes and effects of four types of surface water erosion in the chart below.

River System Development

Scan the map of drainage basins in the United States in your text. Identify three major drainage basins.

1. 
2. 
3. 
**Main Idea**

**Stages of Stream Development**

*I found this information on page ________.*

Sequence the stages of stream development. Complete the flow chart to identify the key features of each stage.

- **Young Streams**
- **Mature Streams**
- **Old Streams**

**Details**

**Contrast** the roles and locations of dams and levees.

Contrast the roles and locations of dams and levees.

- __________
- __________
- __________

**Summarize** how rivers deposit sediments. Describe how deltas and alluvial fans form.

Summarize how rivers deposit sediments. Describe how deltas and alluvial fans form.

As water slows, it __________. These deposits form a delta when __________. They form an alluvial fan when __________.

**Too Much Water**

*I found this information on page ________.*

**Deposition by Surface Water**

*I found this information on page ________.*

Synthesize It

A broad, flat river flows slowly along its bed while a young, swift stream rushes past. Explain which one would probably deposit more sediment.

**SYNTHESIZE IT**

A broad, flat river flows slowly along its bed while a young, swift stream rushes past. Explain which one would probably deposit more sediment.

**Name ____________________ Date __________**

**Section 1 Surface Water (continued)**

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40 Water Erosion and Deposition
Scan the headings in Section 2. Then predict three topics that will be covered in this section.

1. ________________________________

2. ________________________________

3. ________________________________

**Definition**

**pore**
- small, or minute, opening in rock or soil

**Define**

**permeable**
- describes soil and rock with connecting pores through which water can flow

**aquifer**
- layer of permeable rock that allows water to flow through

**water table**
- upper surface of the zone of saturation

**geyser**
- hot spring that erupts periodically and shoots water and steam into the air

**Define**

**underlie**
- to lie beneath

**Use your book or a dictionary to define underlie.**
Section 2 Groundwater (continued)

**Main Idea**

**Groundwater Systems**

I found this information on page ________.

---

**Details**

**Summarize** how groundwater collects. Complete the graphic organizer.

Soil is made of fragments of rocks and minerals with spaces between them.

**Create** a drawing that shows how groundwater flows. Label the impermeable layer, permeable layer, water table, and zone of saturation. Use arrows to show how the groundwater flows.

**Organize** information about wells and springs. Complete the chart.

<table>
<thead>
<tr>
<th>Water Source</th>
<th>Important Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular well</td>
<td></td>
</tr>
<tr>
<td>Artesian well</td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td></td>
</tr>
</tbody>
</table>
Sequence the events that cause a geyser to erupt. Complete the flow chart.

1. 
2. 
3. 
4. 

Complete the concept map to identify ways that groundwater shapes land.

Caves  Stalactites

Groundwater shapes land.

Stalagmites  Sinkholes

CONNECT IT

Aquifers are important natural resources. Due to human activity, the levels of some aquifers have dropped over time. What problems can this cause for humans?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
Scan Section 3 of your text using the checklist below.

☐ Read all section titles.
☐ Read all bold words.
☐ Look at all pictures and labels.
☐ Think about what you already know about waves and shorelines.

Write three facts you discovered about ocean shorelines as you scanned the section.

1. ____________________________________________
2. ____________________________________________
3. ____________________________________________

Define spring tide.

spring tide

Use your book to define the following terms.

longshore current

Use your book or a dictionary to find the meaning of transport as a verb. Then write a sentence using the term.

transport
Complete the graphic organizer below to identify how shoreline erosion occurs.

**Causes of Shoreline Erosion**

- Waves
- Longshore Currents
- Tides

**Sequence** three steps in the erosion process of a rocky shoreline. Create a sketch to help you remember each step.

1. 
2. 
3.
**Main Idea**

**Sandy Beaches**
I found this information on page ________.

**Sand Erosion and Deposition**
I found this information on page ________.

**Details**

**Summarize** how beach sand forms.

Analyze ways that beaches can change.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Analyze** how barrier islands *form and change*. Complete the outline.

I. How barrier islands form
   A. ____________________________________________
   B. ____________________________________________

II. How barrier islands change
   A. ____________________________________________
   B. ____________________________________________

**SYNTHESIZE IT**

Which shoreline feature would you expect to last longest: a rocky shoreline, a sandy beach, or a barrier island? Which would you expect to last the shortest time? Explain your response.

Which shoreline feature would you expect to last longest: a rocky shoreline, a sandy beach, or a barrier island? Which would you expect to last the shortest time? Explain your response.

A. ____________________________________________
   B. ____________________________________________

Which shoreline feature would you expect to last longest: a rocky shoreline, a sandy beach, or a barrier island? Which would you expect to last the shortest time? Explain your response.

A. ____________________________________________
   B. ____________________________________________

Which shoreline feature would you expect to last longest: a rocky shoreline, a sandy beach, or a barrier island? Which would you expect to last the shortest time? Explain your response.

A. ____________________________________________
   B. ____________________________________________

Which shoreline feature would you expect to last longest: a rocky shoreline, a sandy beach, or a barrier island? Which would you expect to last the shortest time? Explain your response.

A. ____________________________________________
   B. ____________________________________________

Which shoreline feature would you expect to last longest: a rocky shoreline, a sandy beach, or a barrier island? Which would you expect to last the shortest time? Explain your response.

A. ____________________________________________
   B. ____________________________________________

Which shoreline feature would you expect to last longest: a rocky shoreline, a sandy beach, or a barrier island? Which would you expect to last the shortest time? Explain your response.

A. ____________________________________________
   B. ____________________________________________

Which shoreline feature would you expect to last longest: a rocky shoreline, a sandy beach, or a barrier island? Which would you expect to last the shortest time? Explain your response.
Tie It Together

Test Soil Permeability

*In a small group, collect several different types of soil or rock, such as gravel, sand, and clay. Test the permeability of each sample by following the process below.*

1. Cut the top from a plastic 2-liter bottle. Be sure to follow safety procedures when cutting.
2. Place about 10 cm of the material to be tested in the bottom part of the bottle.
3. Pour 100 ml of water into the bottle. Use a stopwatch to determine how long it takes the water to soak into the material. Observe the substance carefully until there is no water collected on the surface of the soil or gravel.
4. Record your results in the table below.
5. Remove the material from the bottle, and rinse and dry the bottle thoroughly. Then repeat steps 1–4 with the other materials you chose.

<table>
<thead>
<tr>
<th>Material</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Given your results, which material would you use in the yard of a house built on a low area? Explain your response.*

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Water Erosion and Deposition
Chapter Wrap-Up

Now that you have read the chapter, think about what you have learned and complete the table below. Compare your previous answers with these.

1. Write an A if you agree with the statement.
2. Write a D if you disagree with the statement.

<table>
<thead>
<tr>
<th>Water Erosion and Deposition</th>
<th>After You Read</th>
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<tr>
<td>• The presence of plants can affect how much water runs off the land.</td>
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<td>• Beaches are always made of pieces of rock.</td>
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Review
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☐ Review the information you included in your Foldable.
☐ Study your Science Notebook on this chapter.
☐ Study the definitions of vocabulary words.
☐ Review daily homework assignments.
☐ Re-read the chapter and review the charts, graphs, and illustrations.
☐ Review the Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

Summarize It
After reading this chapter, identify three things that you have learned about erosion and deposition by water.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Clues to Earth’s Past

Before You Read

Before you read the chapter, respond to these statements.

1. Write an A if you agree with the statement.
2. Write a D if you disagree with the statement.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Clues to Earth’s Past</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The footprint of a dinosaur is considered a fossil.</td>
<td></td>
</tr>
<tr>
<td>• Scientists use fossils to learn what an environment was like long ago.</td>
<td></td>
</tr>
<tr>
<td>• The oldest rock layer is always the one found on top.</td>
<td></td>
</tr>
<tr>
<td>• Scientists can determine the age of some rocks.</td>
<td></td>
</tr>
</tbody>
</table>

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

List three fossils that you would expect to find a million years from now in the place you live today.

__________________________
__________________________
__________________________
__________________________
__________________________
__________________________
Clues to Earth’s Past
Section 1 Fossils

**Skim** Section 1 of your book. Read the headings and examine the illustrations. Write three questions that come to mind.

1. ______________________________
2. ______________________________
3. ______________________________

**Review Vocabulary**

**Define** paleontologist to show its scientific meaning.

- paleontologist

**New Vocabulary**

**Define** the following terms to show their scientific meaning.

- permineralized
- remains
- carbon film
- cast
- index fossils

**Academic Vocabulary**

**Define** emerge to show its scientific meaning.

- emerge
Complete the table to describe the two conditions that improve the chances of fossil formation. Give an example of each.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Create a concept web to summarize the types of preservation.

Sequence the steps involved in the making of the cast of a shell.

1. Sediment buries shell.
2. Mold results.
3. Cast results.
Section 1 Fossils (continued)

Main Idea

Index Fossils
I found this information on page _________.

Fossils and Ancient Environments
I found this information on page _________.

Details

Summarize the three characteristics of index fossils.

1. ______________________
2. ______________________
3. ______________________

Analyze why index fossils are more useful to paleontologists than many other fossils.

Organize the kinds of information about ancient environments that scientists can learn from fossils. Complete the graphic organizer.

Information about environment revealed by fossils

CONNECT IT

You find a fossil shell in a layer of rock. It appears to be a clam. What type of rock must the rock layer be? What type of environment would the animal have lived in?

Name ___________________________________________ Date ________________

Clues to Earth’s Past
Scanned the list below to preview Section 2 of your book.
- Read all section headings.
- Read all bold words.
- Look at all of the pictures.
- Think about what you already know about rock.

Write three facts you discovered about the relative ages of rocks as you scanned the section.

1. __________________________________________________________________________
2. __________________________________________________________________________
3. __________________________________________________________________________

Define sedimentary rock to show its scientific meaning.

______

Read each definition below. Write the correct vocabulary term in the blank to the left.

states that in undisturbed rock layers, the oldest rocks are on the bottom and the rocks are progressively younger toward the top

age of something compared with the ages of other things

gap in a sequence of rock layers that is due to erosion or periods without any deposition

Define sequence to show its scientific meaning.

______
Main Idea

Superposition

I found this information on page _________.

Details

Model the principle of superposition by sketching a cross-section of layers of undisturbed sedimentary rock. Number the layers, starting with 1 for the oldest layer.

Describe how the relative age of a rock layer is different from the actual age of the rock layer.

Model how a folded rock formation containing limestone, coal, and sandstone would form. Draw and label the layers as they would form originally. Then draw what they would look like after being folded.
As you pass through a highway cut, you notice distinct layers of rock. Can you be sure that the top layer is the youngest one? Explain.

Accept all reasonable responses. No, the principle of superposition does not necessarily apply because the layers may have been folded.

**Unconformities**

I found this information on page _________.

**Compare and contrast** angular unconformity, disconformity, and nonconformity in rocks by sequencing the steps in their formation.

<table>
<thead>
<tr>
<th>Unconformities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Angular unconformity</td>
</tr>
<tr>
<td>Disconformity</td>
</tr>
<tr>
<td>Nonconformity</td>
</tr>
</tbody>
</table>

**Matching Up Rock Layers**

I found this information on page ____________.

**Identify** the two ways to match up, or correlate, exposed rock layers from two different places. Complete the graphic organizer.

**SYNTHEZESIZE IT**

As you pass through a highway cut, you notice distinct layers of rock. Can you be sure that the top layer is the youngest one? Explain.
Predict three things that might be discussed in Section 3 as you read the headings.

1. 

2. 

3. 

Define isotopes to show its scientific meaning.

isotopes

Define these key terms to show their scientific meaning.

radioactive decay

radiometric dating

uniformitarianism

Define ratio to show its scientific meaning.

ratio
Organize information about radioactive decay as a tool to find a rock’s absolute age. Complete the Venn diagram below with at least six points of information.

Radioactive Decay

- Alpha decay
- Beta decay
- Both

Create a bar chart to show four half-lives. Then draw a curve connecting the tops of the bars. Label each axis.
Analyze carbon-14 dating by completing the statements.

The half-life of carbon-14 is ___________.
When carbon-14 decays, it becomes ___________.
Carbon-14 radiometric dating is used for ___________, ___________, and ___________ samples up to ___________ old. Scientists compare amounts of carbon-14 in the ___________ to the amount in a fossil of an organism that lived long ago. While the organism was alive, it took in and processed carbon-14 and ___________.
The ___________ of carbon-14 to carbon-12 tells the approximate ___________ of the fossil.

Summarize Hutton’s view of uniformitarianism and the modern view of changes that affect Earth.

Hutton’s view: ___________

Modern view: ___________

Synthesize It

Explain why the principle of uniformitarianism is critical to what you have learned about determining the absolute age of rocks.
A paleontologist found the following composition of rock layers at a site. The paleontologist concludes that no folding or other disruption has happened to the layers. What can you conclude about the area’s history? Write a summary of your conclusions.

**Top layer:** coal layer made up of altered plant material

**Middle layer:** mix of sandstone and shale, with some tracks made by dinosaurs

**Bottom layer:** limestone with fossils of clams, snails, and sea lilies

Accept all reasonable responses. At the earliest time shown by the rocks (represented by the limestone layer), the area was under water. Organisms such as clams, snails, and sea lilies lived in the water. Later, when the middle layer formed, the area was above sea level. A river might have deposited the sand from which the sandstone formed. Dinosaurs lived in the area. Later still, the area was a swamp with many lush plants, which later formed coal.
Identify three facts about fossils and rock layers that you found interesting.

1. Fossils can form in many ways, including casts, molds, and carbon films.
2. Fossils can be used to date rock layers.
3. Radioactive elements let scientists find the absolute age of rock layers.
Geologic Time

Before You Read

Preview the chapter title, section titles, and section headings. Complete the first two columns of the table by listing at least two ideas for each section in each column.

<table>
<thead>
<tr>
<th>K</th>
<th>What I know</th>
<th></th>
<th>W</th>
<th>What I want to find out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Describe how an animal or a plant might change if Earth becomes hotter in the next million years.

---

Describe how an animal or a plant might change if Earth becomes hotter in the next million years.

---
Geologic Time
Section 1  Life and Geologic Time

**Skim** the headings in Section 1. Predict two topics that will be covered in this section.
1. ____________________________
2. ____________________________

**Define** **fossils** to show its scientific meaning.

**New Vocabulary**
representation of Earth's history that shows the time units used to divide it
longest subdivision of geologic time
second-longest subdivision of geologic time
subdivision of an era
subdivision of a period
change of species through time
group of organisms that normally reproduce only with other members of their group
process by which organisms that have characteristics that are better suited to an environment have a better chance of surviving and reproducing than those that do not
organism with a three-lobed exoskeleton that was abundant in Paleozoic oceans
large ancient landmass composed of all the continents joined together

**Academic Vocabulary**
Use a dictionary to define **survive**.

__
Distinguish the units of geologic time. Give examples of each.

Largest subdivision: 
Examples: 

Second-largest subdivision: 
Examples: 

Third-largest subdivision: 
Examples: 

Fourth-largest subdivision: 
Examples: 

Complete the table to identify when each of the following key developments in the history of Earth occurred.

<table>
<thead>
<tr>
<th>Event</th>
<th>Eon (if identified)</th>
<th>Era (if identified)</th>
<th>Period (if identified)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First life</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First trilobites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First flowering plants</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sequence the steps of natural selection as described by Darwin.

1. 
   
   
   
2. 
   
   
   
3. 

Organic Evolution

I found this information on page __________.

Main Idea

Geologic Time

I found this information on page __________.
Identify two factors that are necessary for natural selection to occur within a species.

1. 
2. 

Organize information about how trilobites evolved over time.

Complete the flow charts.

Contrast two theories explaining the extinction of trilobites at the end of the Paleozoic era. Fill in the missing words.

Some scientists believe that the formation of __________ caused _________________.

Trilobites could not _________________.

Other scientists suggest that ________________ caused the extinction.

Compare and contrast natural selection and artificial selection.
Geologic Time
Section 2  Early Earth History

Skim Section 2. Write three questions that come to mind from looking at the headings and illustrations.
1. __________________________________________
2. __________________________________________
3. __________________________________________

Define life to show its scientific meaning.
life

Use your book to define each vocabulary term.
Precambrian time

cyanobacteria

Paleozoic Era

Use a dictionary to define hypothesis. Use hypothesis in a sentence to show its scientific meaning.
hypothesis
Precambrian Time

I found this information on page ________.

Summarize two reasons why little is known about the organisms that lived during Precambrian time.

1. ____________________________________________________________________________

2. ____________________________________________________________________________

Sequence important events in the evolution of life during Precambrian time. Complete the flowchart.

The first ________________ appeared on Earth. They used ________________ and produced ________________.

The Paleozoic Era

I found this information on page ________.

Organize information about life during the Paleozoic Era. Complete the concept web with examples of life that appeared during the Paleozoic Era.
Analyze how the characteristics of amphibians and reptiles allowed them to live on land.

**Amphibians**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lungs</td>
<td></td>
</tr>
<tr>
<td>Legs</td>
<td></td>
</tr>
</tbody>
</table>

**Reptiles**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective coating on eggs</td>
<td></td>
</tr>
<tr>
<td>Skin covered with hard scales</td>
<td></td>
</tr>
</tbody>
</table>

Organize information about three possible explanations of the extinctions that took place at the end of the Paleozoic Era.

**Possible Explanations**

1.  
2.  
3.  

Synthesize It

Analyze why rock formations that show the soft parts of Paleozoic organisms are important.

I found this information on page _________.

I found this information on page _________.

I found this information on page _________.

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Preview the What You’ll Learn statements for Section 3. Rewrite each statement as a question. Look for the answers as you read.

1. What were characteristic life-forms in the Mesozoic and Cenozoic eras, and how did they differ?

2. How did changes caused by plate tectonics affect organisms during the Mesozoic Era?

3. When did humans first appear on Earth?

Define dinosaur to show its scientific meaning.

Use your book to define each vocabulary term.

Mesozoic Era

Cenozoic Era

Use a dictionary to define diverse. Then use the term in an original scientific sentence.

diverse
## Main Idea

### The Mesozoic Era

*I found this information on page __________.*

## Details

**Organize** key information about dinosaurs.

<table>
<thead>
<tr>
<th>Size</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dinosaurs**

**Caring for Young**

**Complete** the chart to identify key characteristics of other important organisms from the Mesozoic Era.

<table>
<thead>
<tr>
<th>Description</th>
<th>When They Appeared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birds</td>
<td></td>
</tr>
<tr>
<td>Mammals</td>
<td></td>
</tr>
<tr>
<td>Gymnosperms</td>
<td></td>
</tr>
<tr>
<td>Angiosperms</td>
<td></td>
</tr>
</tbody>
</table>

*I found this information on page __________.*
Section 3  Middle and Recent Earth History (continued)

**Main Idea**

**The Mesozoic Era**  
*I found this information on page ________.*

**Details**

Summarize *what happened at the end of the Mesozoic Era to the environment and many species.*

Distinguish *the two periods that make up the Cenozoic Era*

1. _____________, began about _______ million years ago
2. _____________, began about _______ million years ago

**Analyze** *the effects of changes that occurred during the Cenozoic Era. Complete the diagrams.*

- Grasslands expanded.
- Continents moved apart.
- *Homo sapiens* appeared.

**SYNTHESIZE IT**

Infer how paleontologists study the behaviors of extinct animals, such as taking care of young.
You are directing a new movie about prehistoric times. The script you get shows humans interacting with dinosaurs. Write a memo to the scriptwriter explaining why this would not be scientifically accurate. Suggest two other possible settings, one that includes dinosaurs and one that includes humans.

Memo:
Geologic Time  Chapter Wrap-Up

After You Read

Review the ideas you listed in the chart at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the chart by filling in the third column.

<table>
<thead>
<tr>
<th>K</th>
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<th>W</th>
<th>What I want to find out</th>
<th>L</th>
<th>What I learned</th>
</tr>
</thead>
</table>

Review

Use this checklist to help you study.

☐ Review the information you included in your Foldable.
☐ Study your Science Notebook on this chapter.
☐ Study the definitions of vocabulary words.
☐ Review daily homework assignments.
☐ Re-read the chapter and review the charts, graphs, and illustrations.
☐ Review the Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three things that you have learned about geologic time.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

72  Geologic Time