



LEARN ABOUT

How Rocks Change

Processes That Cause Change

FIND OUT

- about processes that change rocks
- how rocks change over time

VOCABULARY

rock cycle

Follow the blue arrows to learn about the changes that might happen to one rock. ▼

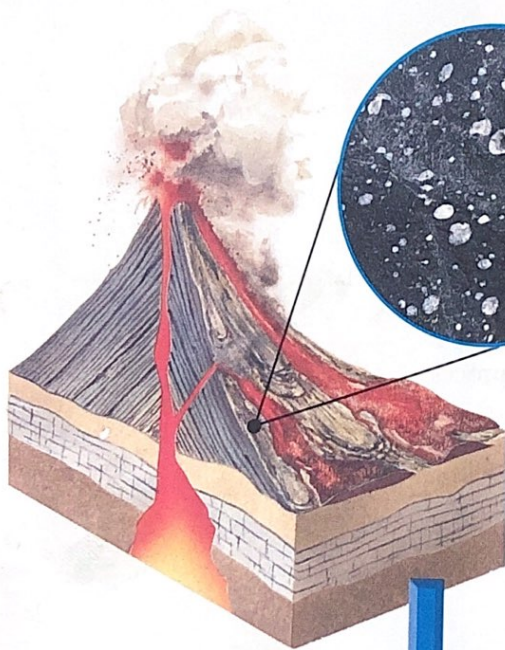
Rocks are always changing. However, the changes usually happen so slowly that you would never notice them. It can take thousands of years for a rock to weather and erode. It can take many more years for the eroded pieces to be changed into sedimentary rock.

You learned in Lesson 2 that high heat and pressure can change rocks. Sometimes the rocks get hot enough to melt completely. When this melted rock cools and hardens, it has changed from metamorphic to igneous. It usually takes many years for rock to be buried deep enough inside Earth to melt.

A rock can begin as one type and be changed many times. You made a model of these changes in the investigation. Instead of a few minutes, however, changes can take many thousands of years. Some part of the first rock, however, will still be there after each change.

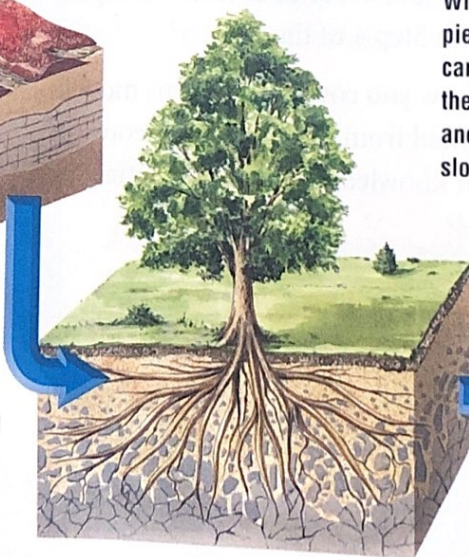
✓ How does weathering affect rock?

◀ Basalt forms when lava quickly cools and hardens at Earth's surface. Basalt is the most common igneous rock on Earth.



Wind or rain carries the weathered pieces of basalt to the river. The river carries the pieces downstream. As they move, they bump into one another. Jagged edges are slowly rounded off. ▼

Tree roots weather the basalt by growing into the rock and breaking it into pieces. Freezing and thawing and rain also weather the rock. ▶



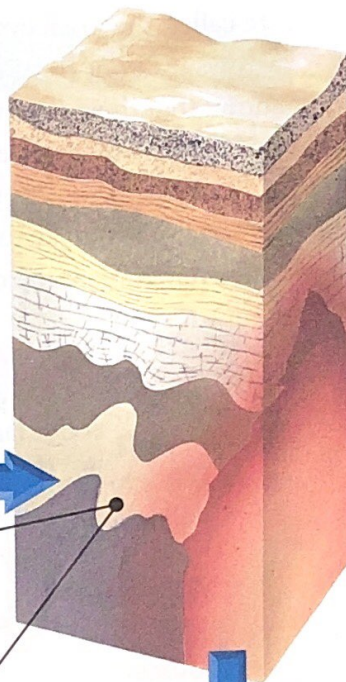
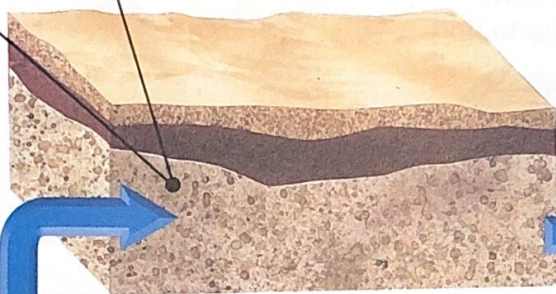
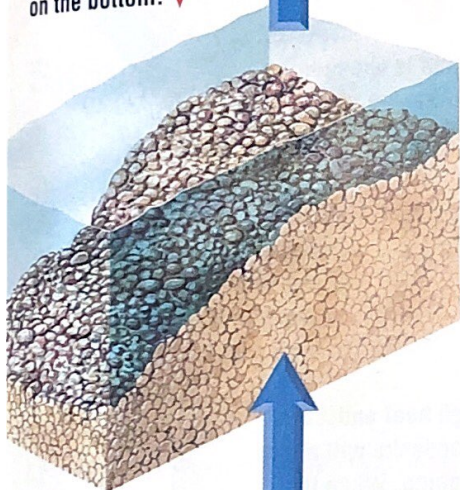


◀ Conglomerate is made up of large, rounded pieces of rocks and minerals. It breaks around the pieces that make it up. ▼

Over time the sediments are compacted, or squeezed, and cemented, or stuck together, to form a sedimentary rock called conglomerate. ▼

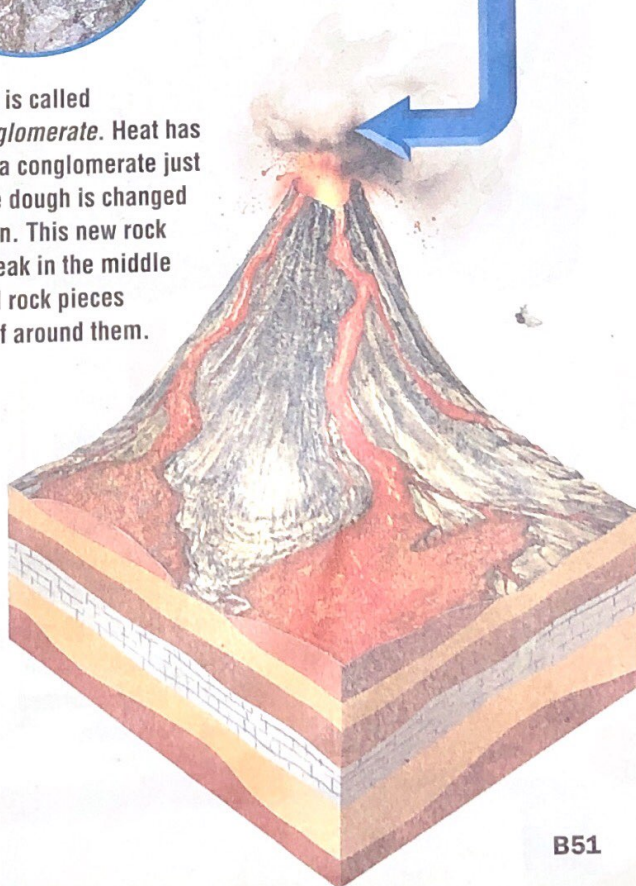
Heat and pressure change the sedimentary rock into metamorphic rock. ▼

When the river slows down, the water deposits the rounded pieces as sediments on the bottom. ▼



▲ This rock is called *metaconglomerate*. Heat has changed a conglomerate just as cookie dough is changed in an oven. This new rock would break in the middle of the old rock pieces instead of around them. ▼

When the metamorphic rock melts completely and then cools and hardens, it becomes igneous rock. It still can be changed again and again. ▼



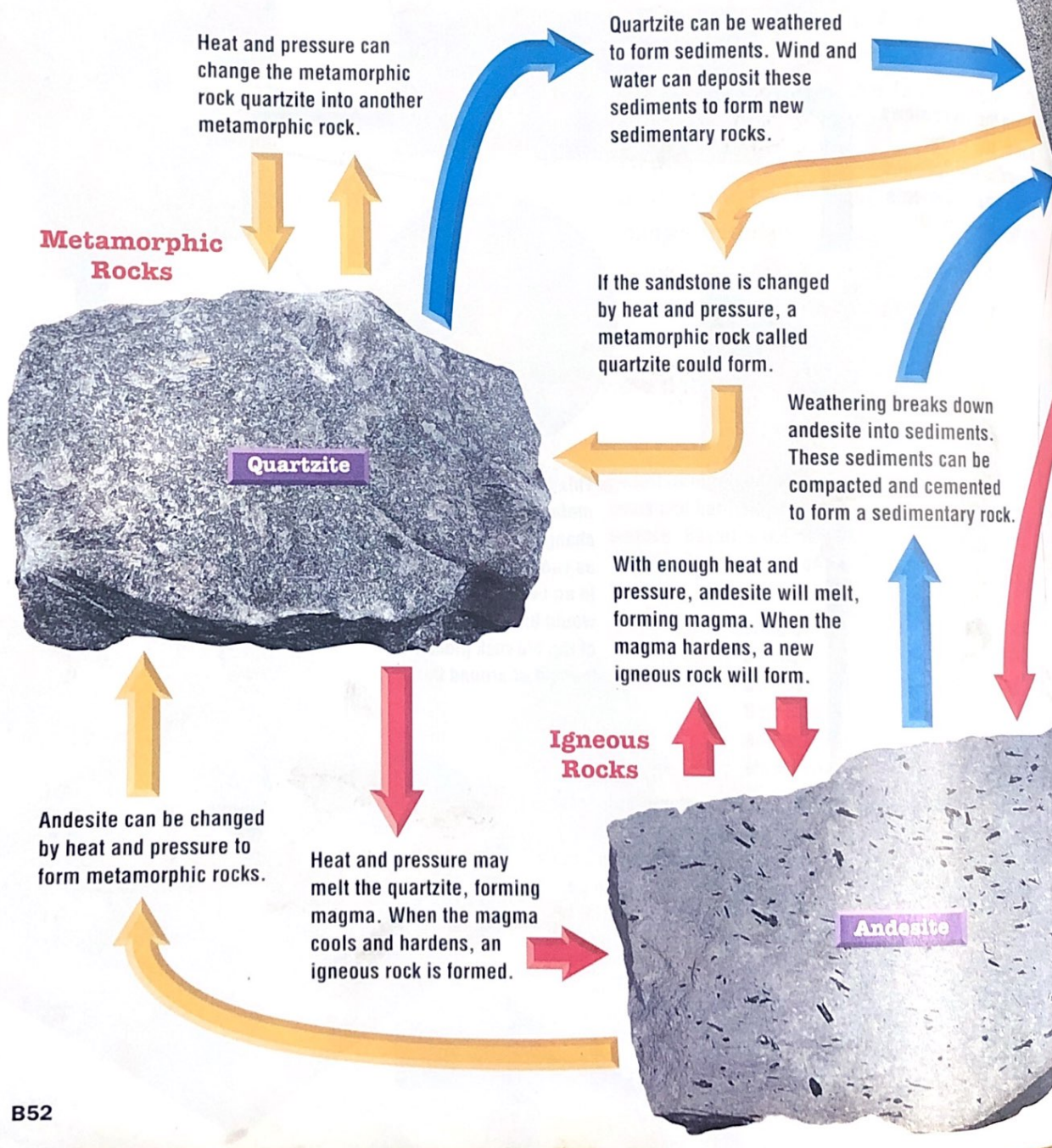
The Rock Cycle

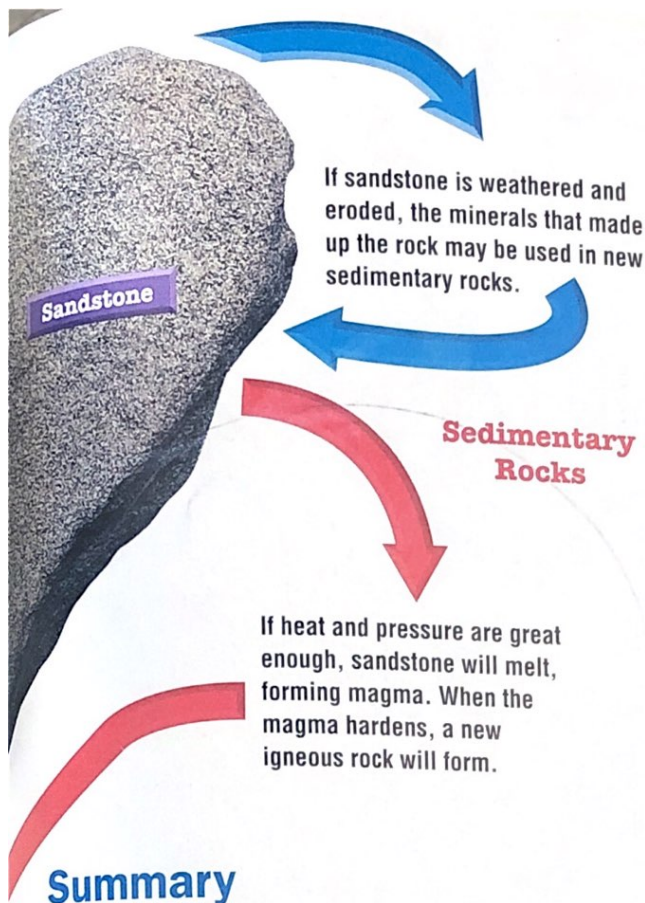
The diagram below and on the next page shows the never-ending rock changes that are called the **rock cycle**. Notice that many arrows lead out from each rock type. This shows that there is more than one path through the rock cycle.

As rocks move through the rock cycle, the materials that make them up are used over and over. Look at the diagram. Try to find

where rocks are squeezed. Also notice where sticking together might take place, where rocks melt, and where rocks are under heat and pressure. As you study the diagram, remember that all these processes take a very long time.

✓ **How can a metamorphic rock be changed into a different metamorphic rock?**





Summary

Rocks change from one kind to another in the rock cycle. Some of the processes in the rock cycle are weathering, erosion, melting, compaction, and cementation.

Review

1. What is the rock cycle?
2. What part do volcanoes play in the rock cycle?
3. What is one thing that can change a rock to metamorphic rock?
4. **Critical Thinking** How might a sandstone change into another sandstone?
5. **Test Prep** What starts the change from an igneous rock to a sedimentary rock?
 - A heat
 - B pressure
 - C melting
 - D weathering



LINKS



MATH LINK

How Long Did It Take? A layer of sedimentary rock is 5 meters thick. The layer was laid down at the rate of 1 centimeter per year. How many years did it take to form?



WRITING LINK

Narrative Writing—Story For a younger child, tell about the “life” of a rock from the rock’s point of view. Tell where the rock has been. Tell where it will go. Make sure the rock has been changed into each type of rock at least once.



SOCIAL STUDIES LINK

Building Materials Use library references to find out why some types of rocks are most often used as building materials in your city. Make a model or poster to show what you learned.



LITERATURE LINK

Everybody Needs a Rock Read the book *Everybody Needs a Rock* by Byrd Baylor. Make a list of rules to follow to find your own special rock.



TECHNOLOGY LINK

Visit the Harcourt Learning Site for related links, activities, and resources.

www.harcourtschool.com/ca

