

# chapter 6 Volcanoes

## section ① Igneous Rock Features

### ● Before You Read

You have learned about magma that is forced up and out of a volcano. Think about what happens to magma that remains under Earth's surface. On the lines below, describe how magma that cools underground might look.

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### ● Read to Learn

#### Intrusive Features

You can see volcanic eruptions because they occur at Earth's surface. However, a lot more volcanic activity occurs underground. In fact, most magma never reaches Earth's surface to form volcanoes or to flow as flood basalts. Most magma cools underground and produces underground rock bodies. Over time, these rock bodies may be seen at Earth's surface if erosion exposes them. These underground rock bodies are called intrusive igneous rock features. There are several different types of intrusive features. The most common types are batholiths (BATH uh lihths), sills, dikes, and volcanic necks.

#### What are batholiths?

**Batholiths** are the largest intrusive igneous rock bodies. They can be many hundreds of kilometers wide and long. They can be several kilometers thick. Batholiths form when magma bodies cool slowly and solidify before reaching Earth's surface. Some batholiths have been exposed at Earth's surface after millions of years of erosion. The remains of a huge batholith can be seen in Yosemite National Park.

### What You'll Learn

- how igneous rock features form
- how volcanic necks and calderas form

#### Study Coach

**Think-Pair-Share** Work with a partner. As you read the text, discuss what you already know about the topic and what you learn from the text.

#### FOLDABLES™

**Write Definitions** Make the Foldable shown below. Write the definition of each word under the tab.



## What are dikes and sills?

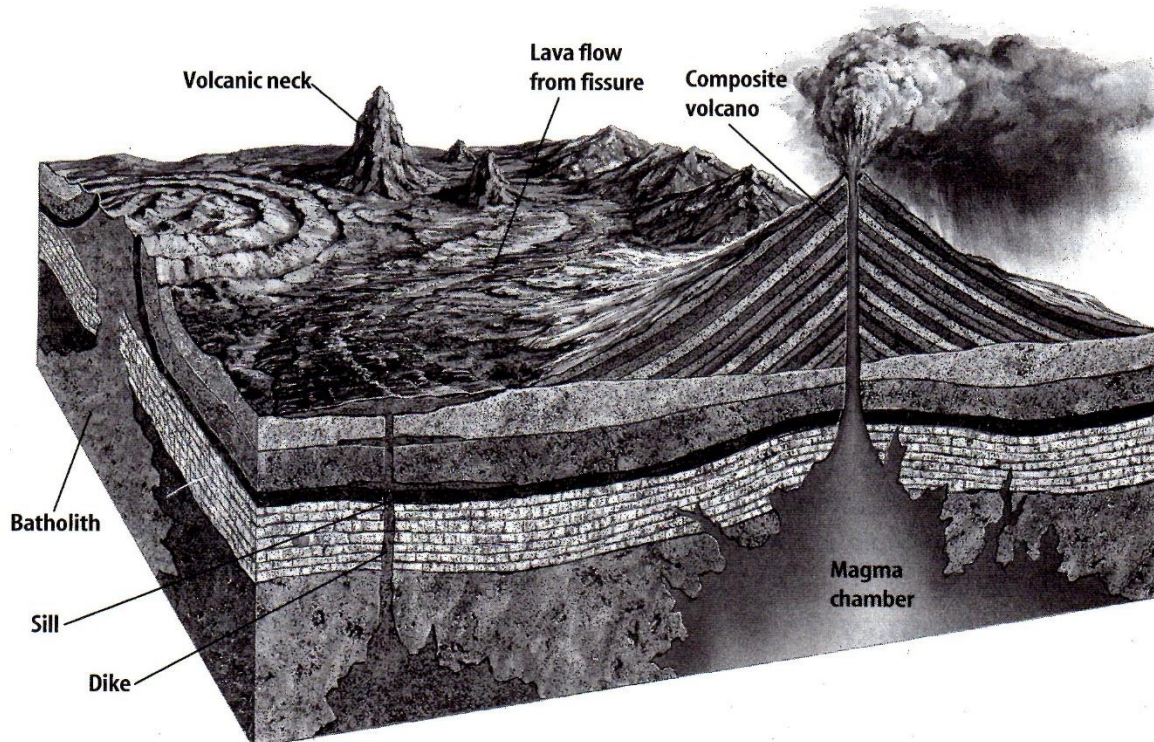
Magma sometimes squeezes into cracks in rock below the surface. This is like squeezing toothpaste into the spaces between your teeth. Magma that is squeezed into a crack that cuts across rock layers and hardens underground is a **dike**. Magma that is squeezed into a crack parallel to rock layers and hardens underground is a **sill**. These two igneous rock features are shown in the figure below. Most dikes and sills run from a few meters to hundreds of meters long.

## Other Features

When a volcano stops erupting, the magma hardens inside the vent. Erosion begins to wear away the volcano. Because the cone is softer than the igneous rock in the vent, it erodes first, leaving behind a volcanic neck. A **volcanic neck** is the solid igneous core of a volcano that is left behind after the softer cone erodes.

### Picture This

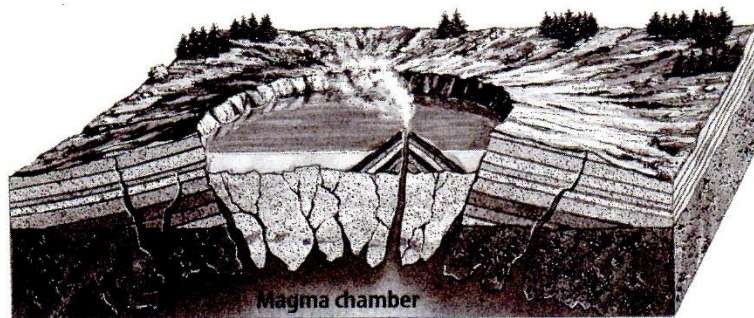
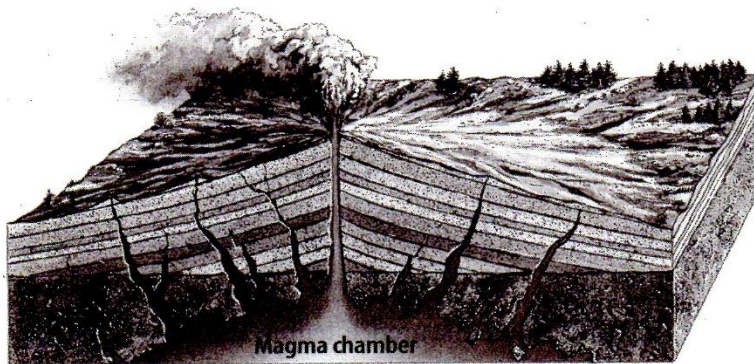
1. **Determine** Color red any features that form above ground. Color blue any features that form underground.



## What are calderas?

Sometimes after an eruption, the top of a volcano collapses. A **caldera** (kal DUR uh) is a large depression, or bowl shape, created when a volcano collapses. The figure below shows the process that forms a caldera. Crater Lake in Oregon is a caldera that filled with water and is now a lake. Crater Lake formed about 7,000 years ago when Mount Mazama erupted violently and then collapsed.

### How Calderas Form



### Picture This

2. **Identify** In the first figure, circle the area where the caldera later formed.

## ● After You Read

### Mini Glossary

**batholith (BATH uh lihth):** large intrusive igneous rock body that forms when magma moving upward cools slowly and hardens underground

**caldera (kal DUR uh):** large depression, or bowl shape, formed when a volcano collapses

**dike:** magma squeezed into cracks that cut across rock layers and hardens underground

**sill:** magma that is squeezed into a crack parallel to rock layers and hardens underground

**volcanic neck:** solid igneous core of a volcano left behind after the softer cone has been eroded

1. Review the terms and their definitions in the Mini Glossary. Then write a sentence explaining the difference between a sill and a dike.

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2. Details are listed in each box. In the first box, write a sentence telling the main idea related to all the details given.

Main Idea:

Detail 1: sill and dike

Detail 2: batholiths

Detail 3: volcanic necks

3. Did the Think-Pair-Share partnering study strategy help you understand what you were reading? Why or Why not?

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