

# Volcanism

## SECTION 18.1 Volcanoes

*In your textbook, read about the anatomy of a volcano and volcanic material.*

Circle the letter of the choice that best completes the statement or answers the question.

- Lava erupts through an opening in Earth's crust called a
  - vent.
  - crater.
  - caldera.
  - volcano.
- A bowl-shaped depression that forms around the vent of a volcano is a
  - magma chamber.
  - vent.
  - crater.
  - sill.
- Broad, gently sloping volcanoes with quiet eruptions are called
  - composite volcanoes.
  - cinder cones.
  - hot spots.
  - shield volcanoes.
- The most explosive volcanoes are
  - hot spots.
  - composite volcanoes.
  - cinder cones.
  - shield volcanoes.
- Most volcanoes form
  - at hot spots.
  - at plate boundaries.
  - in the middle of continents.
  - in the center of ocean plates.
- Which of the following forms when the top or side of a volcano collapses into the magma chamber?
  - dike
  - pyroclastic flow
  - caldera
  - vent
- \_\_\_\_\_ form(s) where plates move apart.
  - Hot spots
  - Divergent volcanism
  - Subduction zones
  - Convergent volcanism
- When magma reaches Earth's surface, it is called
  - a vent.
  - a pyroclastic flow.
  - lava.
  - calderas.
- Volcanoes that form far from plate boundaries are associated with
  - subduction zones.
  - divergent boundaries.
  - ocean ridges.
  - hot spots.

**SECTION 18.1** *Volcanoes, continued*

In your textbook, read about types of volcanoes.

Label the diagrams as *composite volcano*, *cinder-cone volcano*, or *shield volcano*.

10. \_\_\_\_\_



11. \_\_\_\_\_



12. \_\_\_\_\_



Identify the type or types of volcano being described as *shield volcano*, *cinder-cone volcano*, or *composite volcano*.

- \_\_\_\_\_ 13. Forms when small pieces of magma are ejected into the air then fall back to Earth and pile up around a vent
- \_\_\_\_\_ 14. Has broad, gently sloping sides and a nearly circular base
- \_\_\_\_\_ 15. Forms when layers of basaltic lava accumulate during a nonexplosive eruption
- \_\_\_\_\_ 16. Mauna Kea in Hawaii is an example.
- \_\_\_\_\_ 17. Small volcano with steep sides
- \_\_\_\_\_ 18. Forms when layers of hardened lava chunks alternate with lava
- \_\_\_\_\_ 19. Forms from lava that contains relatively small amounts of gases and silica
- \_\_\_\_\_ 20. Forms from lava that is higher in water and silica content than lava that forms shield volcanoes
- \_\_\_\_\_ 21. Fueled by magma that contains large amounts of silica, water, and gases
- \_\_\_\_\_ 22. Magma that fuels this type of volcano contains large volumes of gases but not silica and water.
- \_\_\_\_\_ 23. Potentially the most dangerous to humans and most destructive to the environment
- \_\_\_\_\_ 24. Mount St. Helens and Mount Rainier are examples.

**SECTION 18.1** *Volcanoes, continued*

*In your textbook, read about where volcanoes occur.*

Use each of the terms below just once to complete the passage.

Hawaiian Islands	crust	divergent	hot spots
Iceland	mantle	volcanoes	ocean ridges
Circum-Pacific Belt	western	convergent	

Most of the world's volcanoes form along **(25)** \_\_\_\_\_ plate boundaries. Slabs of oceanic crust descend into the **(26)** \_\_\_\_\_ and melt. The magma that forms is forced upward through the overlying plate and forms **(27)** \_\_\_\_\_ when it reaches Earth's surface. The **(28)** \_\_\_\_\_ marks the locations of most convergent boundary volcanoes. It stretches along the **(29)** \_\_\_\_\_ coasts of North and South America and down the eastern coast of Asia.

At **(30)** \_\_\_\_\_ plate boundaries, magma is forced upward into fractures and faults that form as plates separate or spread apart. Most of the volcanoes that form along divergent boundaries are located underwater along **(31)** \_\_\_\_\_. This type of volcanic activity can be observed above sea level in **(32)** \_\_\_\_\_, which sits atop the Mid-Atlantic Ridge.

Some volcanoes that form far from plate boundaries form over **(33)** \_\_\_\_\_, which are unusually hot regions of Earth's mantle. At hot spots, high-temperature plumes melt rock. The magma that forms moves upward toward the **(34)** \_\_\_\_\_ and melts the crust to form a volcano. As a tectonic plate moves over a hot spot, a string of volcanoes forms. The **(35)** \_\_\_\_\_ are forming as the result of a hot spot.

**SECTION 18.2 Eruptions**

*In your textbook, read how magma forms.*

For each statement below, write *true* or *false*.

- \_\_\_\_\_ 1. Magma is a mixture of molten rock, suspended minerals, and gases.
- \_\_\_\_\_ 2. Magma forms when rocks begin to melt.
- \_\_\_\_\_ 3. Pressure decreases with depth below Earth's surface.
- \_\_\_\_\_ 4. As pressure increases, the temperature at which a dry substance melts increases.
- \_\_\_\_\_ 5. Wet minerals and rocks melt at lower temperatures than do dry minerals and rocks.

Answer the following questions.

6. What three factors affect the formation of magma?

\_\_\_\_\_

7. Why isn't Earth's entire mantle liquid?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. How does water affect the melting temperature of a mineral?

\_\_\_\_\_  
\_\_\_\_\_

**SECTION 18.2 Eruptions, continued**

In your textbook, read about the types of magma.

Use each of the terms below just once to complete the passage.

andesitic                      continental                      extrusive                      granite                      rhyolitic  
 sediments                      silica                      slowly                      upper mantle                      viscosity

Magmas are named after (9) \_\_\_\_\_ rocks. Basaltic magma forms when rocks in the (10) \_\_\_\_\_ melt. This magma contains small amounts of silica and has a low (11) \_\_\_\_\_. Basaltic magma fuels relatively quiet volcanic eruptions.

Andesitic magma forms from oceanic crust and (12) \_\_\_\_\_. This magma contains about 60 percent silica and has an intermediate viscosity. (13) \_\_\_\_\_ magma fuels volcanoes with intermediate eruptions.

Rhyolitic magma forms deep beneath (14) \_\_\_\_\_ crust. This magma has the highest (15) \_\_\_\_\_ content of the three types of magma. It has the same composition as (16) \_\_\_\_\_, has a high viscosity, and flows (17) \_\_\_\_\_. (18) \_\_\_\_\_ magma produces very explosive volcanoes.

Answer the following questions.

19. How does the viscosity of magma change as magma cools?

\_\_\_\_\_

20. Does cooler magma flow more or less quickly than hotter magma?

\_\_\_\_\_

21. Is the viscosity of magma that is high in silica higher or lower than magma that is low in silica?

\_\_\_\_\_

22. Which type of lava—basaltic lava or rhyolitic lava—flows faster? Explain.

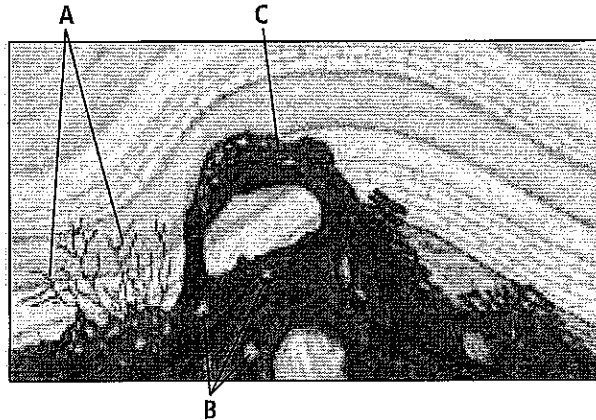
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\_\_\_\_\_

### SECTION 18.3 Intrusive Activity

In your textbook, read about how magma affects surrounding rocks.

Match each letter on the diagram with its description.



- \_\_\_\_\_ 1. Magma can melt rocks with which it comes into contact.
- \_\_\_\_\_ 2. Magma can fracture apart overlying rocks and rise through cracks and fissures.
- \_\_\_\_\_ 3. Magma can cause blocks of rocks to break off, sink into the magma, and eventually melt.

In your textbook, read about plutons and tectonics.

For each item in Column A, write the letter of the matching item in Column B.

#### Column A

- \_\_\_\_\_ 4. Intrusive igneous rock body
- \_\_\_\_\_ 5. Largest pluton
- \_\_\_\_\_ 6. Irregularly shaped pluton that is similar to a batholith, but smaller in size
- \_\_\_\_\_ 7. Mushroom-shaped pluton
- \_\_\_\_\_ 8. Pluton that is parallel to the rocks it intrudes
- \_\_\_\_\_ 9. Pluton that cuts across preexisting rocks
- \_\_\_\_\_ 10. Process responsible for the formation of many plutons

#### Column B

- a. stock
- b. sill
- c. laccolith
- d. pluton
- e. batholith
- f. dike
- g. mountain-building