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Section 10.1 Volcanoes and Plate Tectonics

This section explains how magma forms and discusses the relationship between plate boundaries and igneous activity.

Reading Strategy

Outlining After you read, complete the outline of the most important ideas in the section. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

I. Origin of Magma
   A. Heat
   B. _____
   C. _____

II. Volcanoes and Plate Boundaries
   A. _____
   B. _____
   C. _____

Origin of Magma

1. Is the following sentence true or false? Magma forms when solid rock in the crust and upper mantle partially melts.

_____

2. How is decompression melting of rocks triggered? _____

_____

3. _____ rock buried at depth has a much lower melting temperature than does _____ rock of the same composition and under the same pressure.

Volcanoes and Plate Boundaries

4. Is the following sentence true or false? When solid mantle rock rises during seafloor spreading, magma is produced as a result of decompression melting._____

5. Circle the letter of the change that allows rock melting to begin at convergent plate boundaries.

a. decreasing pressure
b. decreasing temperature
c. water reducing the melting point
d. water raising the melting point

6. What landforms develop as a result of the volcanic activity that occurs where one oceanic plate descends beneath another oceanic plate? _____

_____

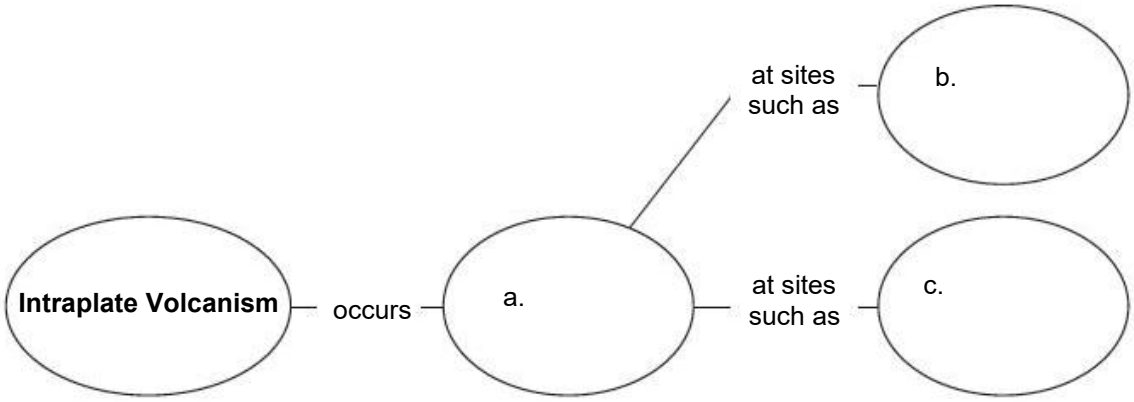
_____

7. Circle the letter of the answer that correctly completes the following sentence. At a convergent plate boundary, the fluids reduce the melting point of hot mantle rock enough for melting to begin when a sinking slab reaches a depth of about

a. 100 to 150 km. b. 500 to 550 km.

c. 700 to 750 km. d. 1000 to 1500 km.

8. Complete the concept map showing where intraplate volcanism occurs.



9. Circle the letter of the time most intraplate volcanism occurs.

a. when oceanic crust sinks into the mantle and melts

b. when a mantle plume rises to the surface

c. when oceanic plates separate and magma rises to fill the rift

d. when continental crust sinks into the mantle and melts

10. The result of a magma plume rising and decompression melting occurring may be the formation of a small volcanic region called a(n) _____.

11. Circle the letter of the number of years most hot spots have lasted.

a. hundreds of years b. thousands of years

c. millions of years d. billions of years

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Chapter 10 Volcanoes and Other Igneous Activity

Section 10.2 The Nature of Volcanic Eruptions

This section discusses volcanic eruptions, types of volcanoes, and other volcanic landforms.

Reading Strategy

Previewing Before you read the section, rewrite the green topic headings as questions. As you read, write the answers to the questions. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

The Nature of Volcanic Eruptions	
What factors affect an eruption?	a.

Factors Affecting Eruptions

1. What are three factors that determine how violently or quietly a volcano erupts? _____

_____

_____

2. Circle the letter of the term that describes lava's resistance to flow.

a. temperature
b. eruption
c. viscosity
d. basaltic

Volcanic Material

3. Is the following sentence true or false? One thing all volcanic eruptions have in common is that they emit large amounts of gas.

_____

4. During a volcanic eruption, particles called _____, ranging from very fine dust to pieces weighing several tons, are ejected.

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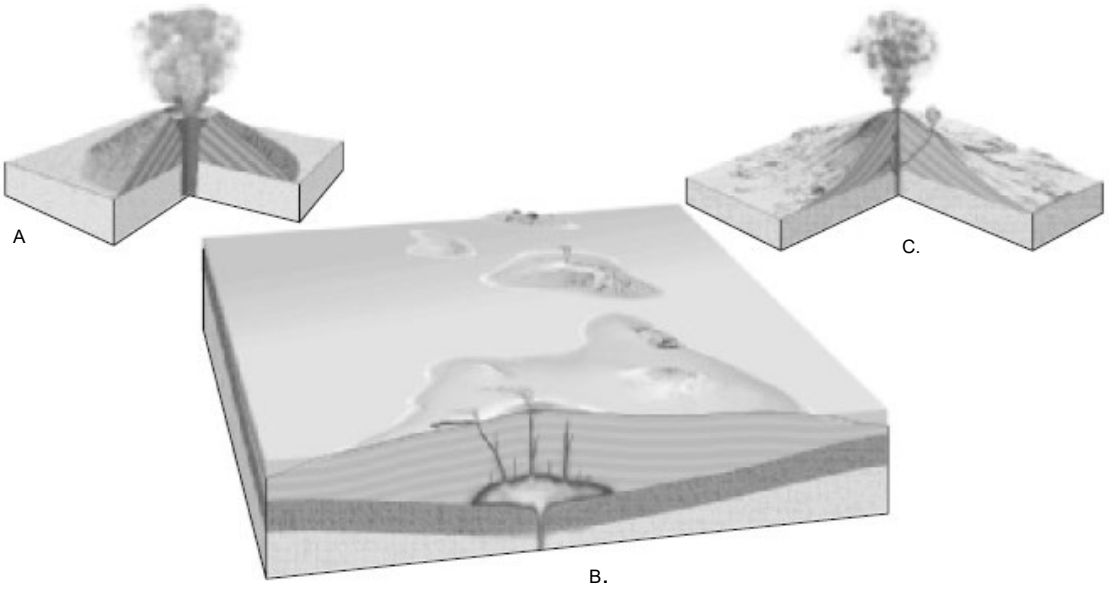
Types of Volcanoes

5. Select the appropriate letter in the figure that identifies each of the following types of volcanoes.



_____ shield volcano _____ cinder cone _____ composite cone

6. The steep-walled depression known as a(n) _____ is located at the summit of many volcanoes.

7. Circle the letter of the type of volcano that is the product of gas-rich basaltic magma mostly in the form of loose pyroclastic material.

a. cinder cone b. shield volcano
c. stratovolcano d. composite cone

Other Volcanic Landforms

Match each description with its volcanic landform or feature.

	Description	Volcanic Landform or Feature
_____	**8.** wide area that forms when low-viscosity basaltic lava flows from fissures	a. caldera b. lava plateau c. volcanic neck
_____	**9.** rock conduit that remains when the surrounding cone has been eroded	
_____	**10** depression formed by the collapse of the top of a volcano	

Volcanic Hazards

11. Is the following sentence true or false? Cinder cones are the most dangerous volcanoes. _____

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Chapter 10 Volcanoes and Other Igneous Activity

Section 10.3 Intrusive Igneous Activity

This section explains how to classify intrusive igneous features.

Reading Strategy

Comparing and Contrasting After you read, compare the types of intrusive igneous features by completing the table. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Types of Plutons	Description
Sill	a.
Laccolith	b.
Dike	c.
Batholith	d.

Classifying Plutons

1. Select the appropriate letter in the diagram that identifies each of the following igneous intrusive features.

_____ sill

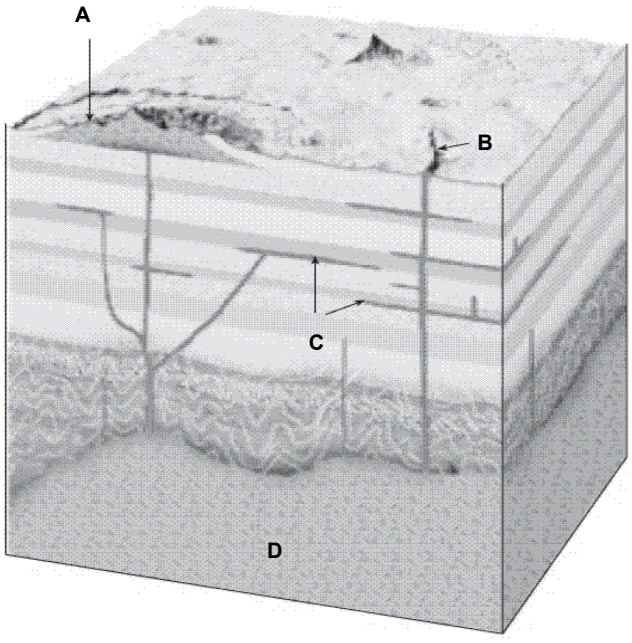
_____ batholith

_____ laccolith

_____ dike

2. Is the following sentence true or false? Plutons can be studied on Earth's surface as they form.

_____



3. What three characteristics are used to classify intrusive igneous bodies? _____

_____

Match each way plutons formed with the pluton type.

	How Formed	Pluton
_____	**4.** when magma from a large magma chamber invades fractures in the surrounding rocks	a. sill b. laccolith c. dike
_____	**5.** when magma is injected between sedimentary layers close to Earth's surface and collects as a lens-shaped mass	
_____	**6.** when magma is injected along sedimentary bedding surfaces close to Earth's surface	

Batholiths

7. A large intrusive igneous body with an area greater than 100 km^2 exposed at the surface is called a _____.