

# Inside Earth: Chapter 3- Volcanoes



## Section 1: Volcanoes & Plate Tectonics

# Guide For Reading

- Where are Earth's volcanic regions found, and why are they found there?

A volcano named \_\_\_\_\_ on the island of \_\_\_\_\_ had a series of eruptions lasting for more than \_\_\_\_\_.

- Soufriere Hills
- Montserrat
- 2 years

# Where is this island located?

- The island of Montserrat is located in the Caribbean Sea
- The island is apart of the chain of islands called the Lesser Antilles

What Is a Volcano?

# Volcano

- A weak spot in the crust where molten material, or magma, comes to the surface

is a molten mixture of rock - forming substances, gases, and water from the mantle.

- Magma

# Lava

- Magma that reaches Earth's surface becomes lava
- After lava cools, it becomes rock

Volcanic activity is a constructive force? Explain this statement.

- Volcanic activity is a constructive force because when the lava cools, it hardens, adding new material to the surface of Earth
- Volcanic activity build up Earth's surface

# Location of Volcanoes

There are more than \_\_\_\_\_  
active volcanoes on land.

- 600

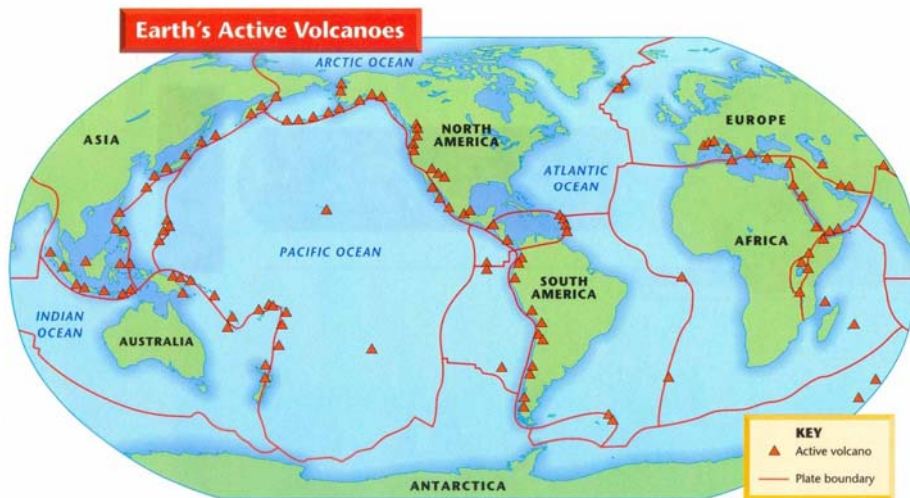
# What is the Ring of Fire and where is it located?

- The Ring of Fire is a belt of volcanoes that rim the Pacific Ocean

# Figure 1 **Observing** (page 89)

What other patterns can you see in the locations of Earth's volcanoes?

## 12 Earth's Active Volcanoes



- Volcanic belts such as the Ring of fire almost always occur along other plate boundaries

Volcanic activity most often occurs along \_\_\_\_\_, where crust pulls apart, \_\_\_\_\_, where crust pushes together, and \_\_\_\_\_ far from the boundaries of continental or oceanic plates.

- divergent plate boundaries
- convergent plate boundaries
- hot spots

# Volcanoes at Diverging Plate Boundaries

# What is the mid-ocean ridge? (Chapter 1)

- An undersea mountain chain where new ocean floor is produced (sea-floor spreading)
- Also a place where volcanic activity is high

Where do volcanoes at the mid-ocean ridge rise above the ocean's surface?

- Iceland
- Azores Islands (Atlantic Ocean)

# Volcanoes at Converging Boundaries

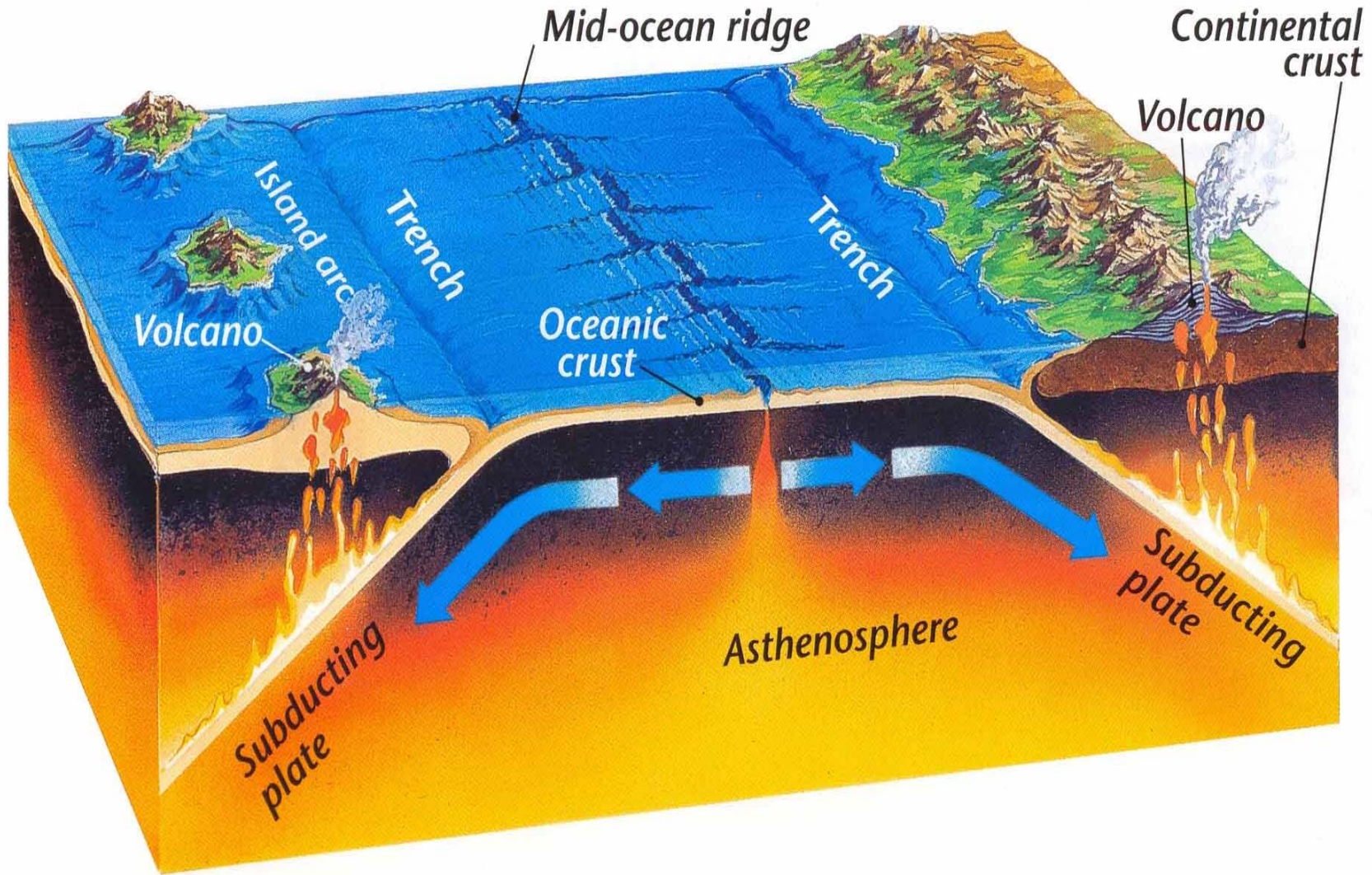
# What is subduction?

- The process by which oceanic crust sinks through a deep-ocean trench and back into the mantle

# Why do many volcanoes occur on islands near where two oceanic plates collide?

- The older, denser plate dives under the other plate (subduction) creating a deep-ocean plate
- When the rock heats and becomes magma, it seeps through the crust
- When the magma breaks through the crust, volcanoes occur

# 13 Volcanoes at Converging Boundaries



# Island Arc

- A string of islands that form from volcanic activity

# List Earth's major island arcs.

- Japan
- New Zealand
- Indonesia
- Caribbean islands
- Philippines
- Aleutians

# How are volcanoes on land formed?

- Subduction occurs where the edge of a continental plate collides with an oceanic plate
- The collisions create volcanic eruptions

Volcanoes on land include \_\_\_\_\_  
on the west coast of South  
America and the volcanoes of the  
\_\_\_\_\_ in the United States.

- the Andes mountains
- Pacific Northwest

**Checkpoint (page 90)** How can oceanic crust eventually become magma?

- The oceanic crust sinks through a deep-ocean trench into the mantle, where it melts to form magma

# Hot Spot Volcanoes

# Hot Spot

- An area where magma from deep within the mantle melts through the crust like a blow torch
- Hot spots do not result from subduction

# Where are hot spots found?

- Hot spots often lie in the middle of continental or oceanic plates far from plate boundaries

A series of volcanic hot spots that formed in the ocean floor are the \_\_\_\_\_, which formed one by one over millions of years as the Pacific plate drifted.

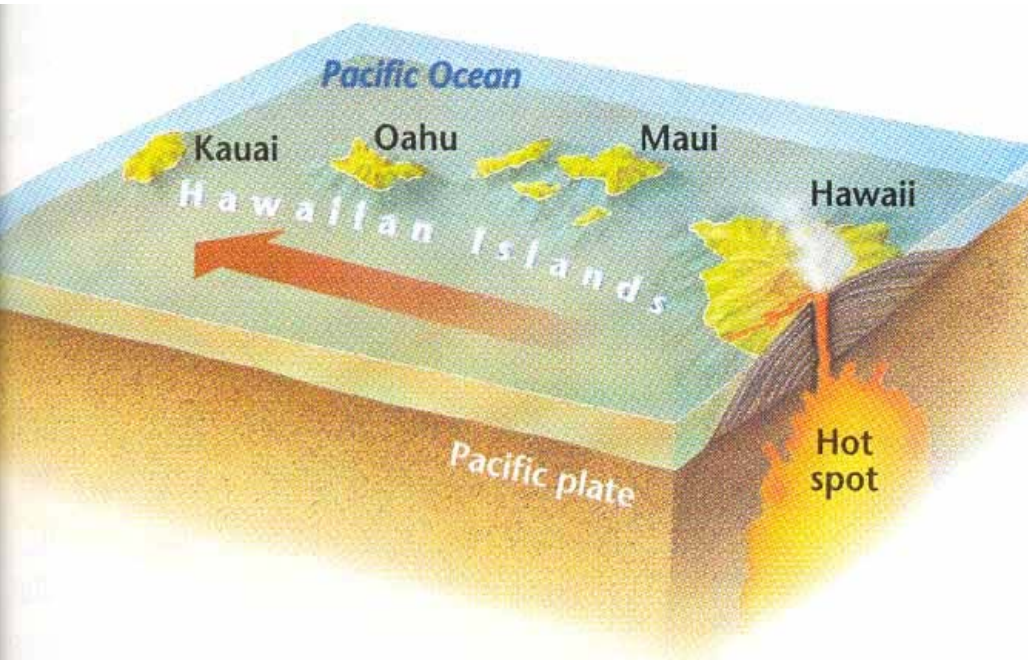
- Hawaiian islands

An example of a hot spot that formed on land is the \_\_\_\_\_, which formed under the North American plate.

- Yellowstone National Park

# Figure 3 **Inferring** (page 91)

Which island on the map formed first?



- Kauai formed first because it is the furthest island from the hot spot

# Guide For Reading

# Where are Earth's volcanic regions found, and why are they found there?

- Divergent plate boundaries (Mid-Ocean Ridge)
  - As the ocean floor moves apart lava pours out of the cracks
- Convergent plate boundaries (trenches)
  - Subduction causes rock to return to the mantle and rise again as magma
- Hot spots (middle of plates)
  - Hot magma melts through Earth's crust like a blow torch