Edgenuity

Warm-Up | Volcanoes

Lesson Question

Lesson Goals

Identify the reasons why Earth's volcanic regions are located in certain areas.

Explain what happens when a volcano erupts.

Distinguish the two types of volcanic _____.

Describe the three stages of volcanic activity.

Explain how volcanoes create various landforms.

Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

hot spot	an area where material from deep in the _____ rises and melts, forming magma
lava	_____ rock found at Earth's surface
magma	liquid rock found _____ Earth's surface
magma chamber	a large _____ of magma deep under Earth's surface
pipe	the channel in a _____ through which magma rises to reach Earth's surface

© Edgenuity, Inc.

Warm-Up | Volcanoes

Words to Know

vent	the opening at the [ ] of a volcano
viscosity	the measure of a liquid's resistance to [ ]
volcano	a weak spot in the [ ] where magma pushes to the surface

Plates and Boundaries

Earth's crust is broken into major pieces called plates.

- Plates carry both land and [ ].
- Plates move very [ ].
- Plate boundaries occur where two plates meet.
  - The three types of [ ] are divergent, convergent, and transform.

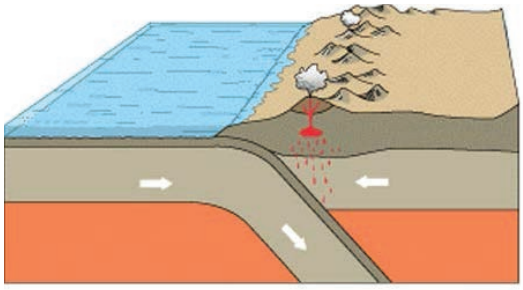
© Edgenuity, Inc.

Warm-Up | Volcanoes

Subduction

The process of subduction produces _____.

- _____ plate slides under lighter plate.
- Crust material becomes molten rock.
- _____ rock rises back toward surface.
- Volcanic activity occurs on lighter plate.



© Edgenuity, Inc.

Instruction | Volcanoes

Slide 2

Volcanoes

A **volcano** is a weak spot in Earth's crust where molten material comes to the surface.

- _____ – molten rock found beneath Earth's surface
- _____ – molten rock found on Earth's surface

Locations of Volcanoes

Volcanoes occur in many locations that stretch across _____ and _____.



© Edgenuity, Inc.

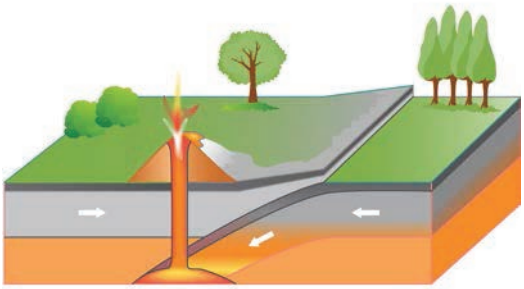
Instruction | Volcanoes

Slide 2

Volcanoes at Convergent Boundaries

Volcanoes commonly form along convergent boundaries.

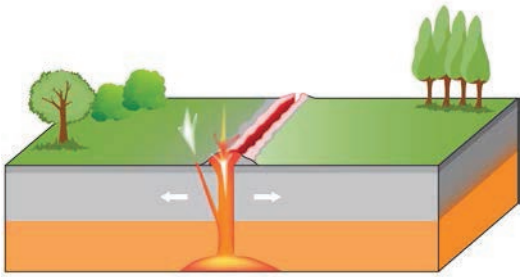
- Subduction occurs.
- Magma breaks through the [ ].
- Volcanic mountains form when this happens on [ ].
- Island arcs form when this happens at [ ].



Volcanoes at Divergent Boundaries

Volcanoes can form along divergent boundaries on land and under the ocean.

- Plates move away from each other.
- [ ] flows out of cracks in crust.
- This forms rift [ ], where crust is pulling apart.
- It also forms mid-ocean ridges, where crust is being lifted up by a hot spot in the [ ].



© Edgenuity, Inc.

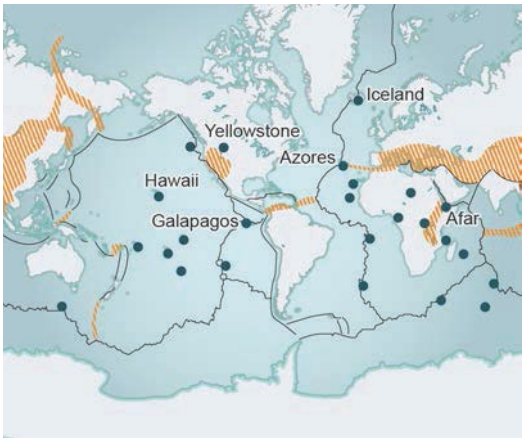
Instruction | Volcanoes

Slide 4

Hot Spots

Volcanoes also form at **hot spots**.

- Material from the mantle rises and erupts through the crust.
  - In the middle of _____
  - On or near boundaries



Hot Spot Activity

Hot spots can create _____ or _____ activity.



The _____ Islands formed over a hot spot.



_____ National Park lies over a hot spot, leading to geothermal activity.

© Edgenuity, Inc.

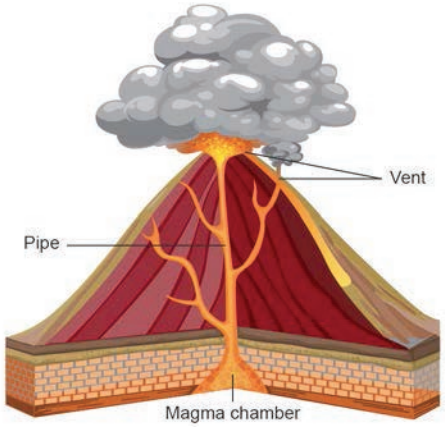
Instruction | Volcanoes

Slide 7

Features of a Volcano

Volcanoes have several important features that are key to eruptions.

- **Magma chamber** – pocket of magma below the surface
- [ ] – chamber in a volcano where magma rises
- [ ] – area where molten material, gas, and ash erupt from a volcano



Exterior Volcanic Features

When volcanoes erupt, they create features.



[ ]



[ ] flow

© Edgenuity, Inc.

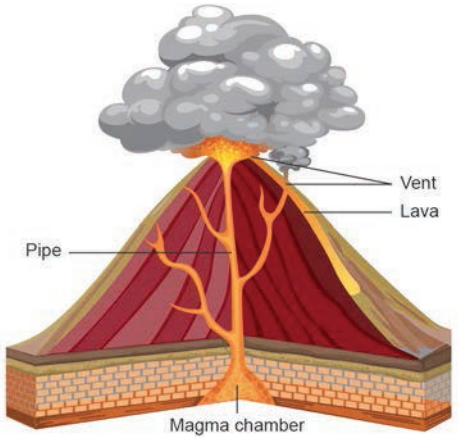
Instruction | Volcanoes

Slide 7

Details of an Eruption

Volcanic eruptions are caused by _____ in magma chambers.

- Dissolved gases trapped in _____ are under a lot of pressure.
- As magma rises, pressure decreases, causing the gases to expand and form _____.
- The force of the expanding _____ pushes the magma from the magma _____ through the pipe and vent.



9

Quiet Eruptions

The physical properties of a volcano's magma determine how the volcano erupts.

- Quiet eruption
  - Magma is low in _____ and has a _____ **viscosity**.
  - Gases bubble out gently, and lava flows quietly.
  - _____ sets fire to and buries everything in its path.

© Edgenuity, Inc.

Instruction | Volcanoes

Slide 9

Explosive Eruptions

The second type of volcanic eruption is called an explosive eruption.

- Magma is high in silica, and it has a [ ] viscosity.
- Gases become trapped in the volcano's [ ], causing them to violently explode.
- Gases push magma out with great force.
- This force breaks lava into [ ] that cool quickly and harden.

Slide 12

Volcanic Activity

The three stages of volcanic activity are active, dormant, and extinct.



[ ] – erupting or shows signs of erupting again soon



[ ] – hasn't erupted for a long time but may in future



[ ] – unlikely to erupt again

© Edgenuity, Inc.

Instruction | Volcanoes

Slide 12

Monitoring Volcanoes

[ ] constantly monitor the conditions around volcanoes.

- [ ] and GPS detect surface changes.
- Seismometers detect [ ] below the surface.
- [ ] monitoring measures carbon dioxide and sulfur dioxide.
- [ ] monitoring listens to sounds inside the volcano.

15

Landforms from Lava and Ash

Six important landforms are created by volcanic lava and ash. The first three are shield volcanoes, cinder cone volcanoes, and composite volcanoes.



[ ] Volcano



[ ] Cone Volcano



[ ] Volcano

© Edgenuity, Inc.

Instruction | Volcanoes

Slide 15

Landforms from Lava and Ash

The other three landforms created from volcanic lava and ash are lava plateaus, calderas, and volcanic soils.







Lava [ ]

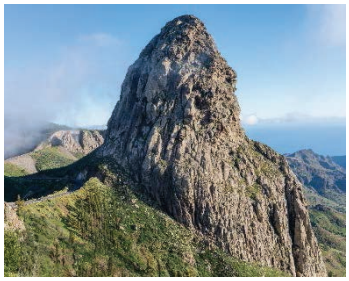
[ ]

[ ] soils

Slide 17

Landforms from Magma

When magma cools below the surface, it creates some fascinating features. These landforms are not visible until surrounding rock erodes, which takes millions of years.







Volcanic neck – a pipe that fills with [ ] magma

[ ] – a large mass cooled deep inside Earth

Dome mountain – raised [ ] from hardened magma

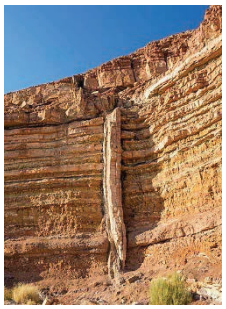
© Edgenuity, Inc.

Instruction | Volcanoes

Slide 17

Landforms from Magma

Magma also creates landforms by intruding into existing rock formations.



A _____ is a hardened magma intrusion that cuts vertically through older rock layers.



A _____ is a hardened magma intrusion that cuts horizontally across layers.

Geothermal Activity

The heat associated with volcanic activity can create distinct geological features, too.



_____ occur when heated water erupts.



Hot springs are found where water is _____ by magma.



Mud pots are pools of boiling, _____ mud.

© Edgenuity, Inc.

Summary | Volcanoes

Lesson Question

What causes volcanoes?

Answer

Slide 2

Review: Key Concepts

A volcano forms at a weak spot in Earth's crust where magma comes to the surface.

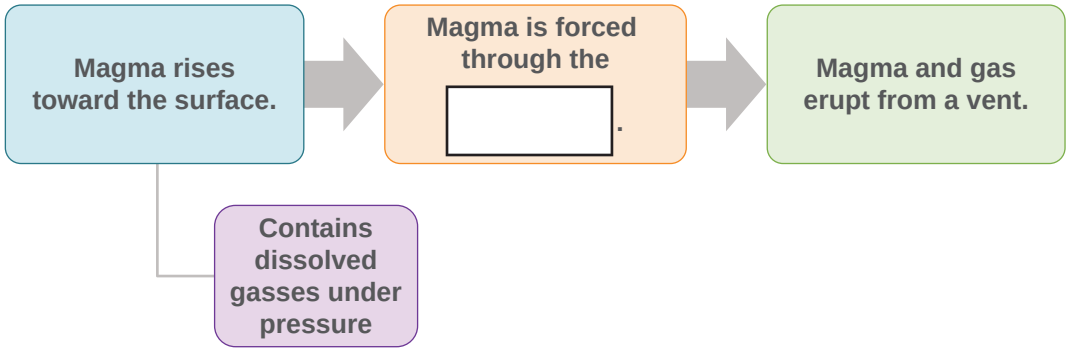
- Volcanoes occur at convergent boundaries, divergent boundaries, and hot spots.
- The two kinds of eruptions are determined by magma.
  - _____ eruptions: Magma is low in silica and has low viscosity.
  - _____ eruptions: Magma is high in silica and has high viscosity.
- Volcanoes are classified as active, dormant, or _____.

© Edgenuity, Inc.

Summary | Volcanoes

Slide 2

Review: Key Concepts



Review: Key Concepts

Volcanic Landforms from Lava and Ash

- Shield volcanoes
- ____ cone volcanoes
- Composite volcanoes
- Lava plateaus
- Calderas
- ____ soils

Volcanic Landforms from Magma

- Volcanic necks
- Batholiths
- ____ mountains
- Dikes
- Sills

© Edgenuity, Inc.

Summary | Volcanoes

Use this space to write any questions or thoughts about this lesson.

© Edgenuity, Inc.