



Tungurahua Volcano, Ecuador
Picture by Alcinoe Calahorrano

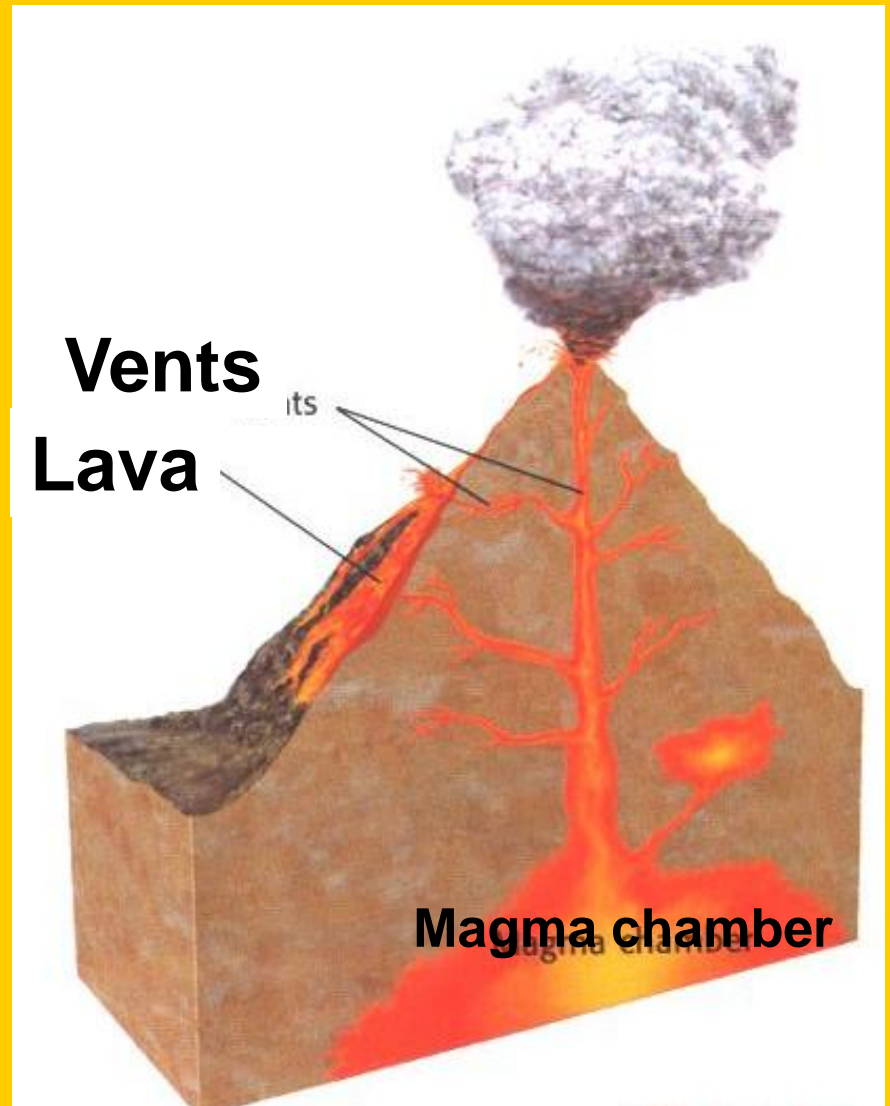
Volcanoes

Volcanoes

form around

vents that

release magma
onto the Earth's
surface.

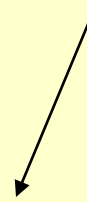


Volcanic Eruptions

- Nonexplosive Eruptions



Lava flow



Lava fountain



- Explosive Eruptions



What is *Lava*?

-magma that flows onto the Earth's surface

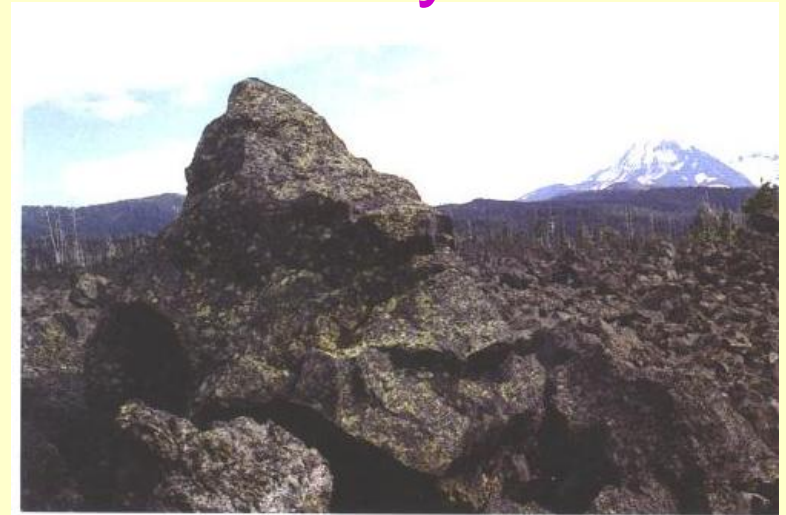
The Composition of Magma Determines whether it is explosive or not!

- High **water** content
 - More likely to be **EXPLOSIVE !!!**
- High **silica** content
 - More likely to be **EXPLOSIVE !!!**
 - **Why?**
 - Silica has a thick, stiff consistency
 - Flows slowly
 - Tends to Harden in the volcano's vent

What Erupts from a Volcano?

Lava can be thick or thin.

Blocky lava



Pahoehoe



Aa



Pillow lava



What Erupts from a Volcano?

Pyroclastic material

- **Rock** fragments created by **EXPLOSIVE** eruptions
 - magma explodes from volcano and solidifies in the air
 - existing rock is shattered by powerful eruptions



Volcanic blocks



Volcanic bombs

Lapilli



Volcanic ash



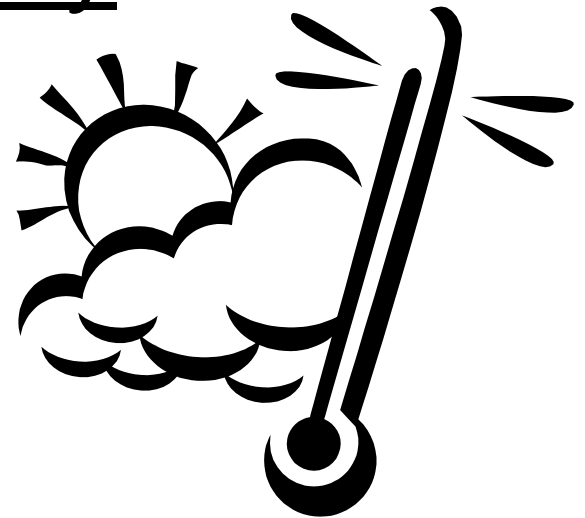
How do volcanoes affect the Earth?

Flows and Fallouts

- hot ash can flow really quickly
 - Knock down buildings
 - Dam rivers (flooding/drought)
 - Kill crops and livestock

Climatic Changes

- Ash & Gases can block sunlight
- Drop average global temperature noticeably

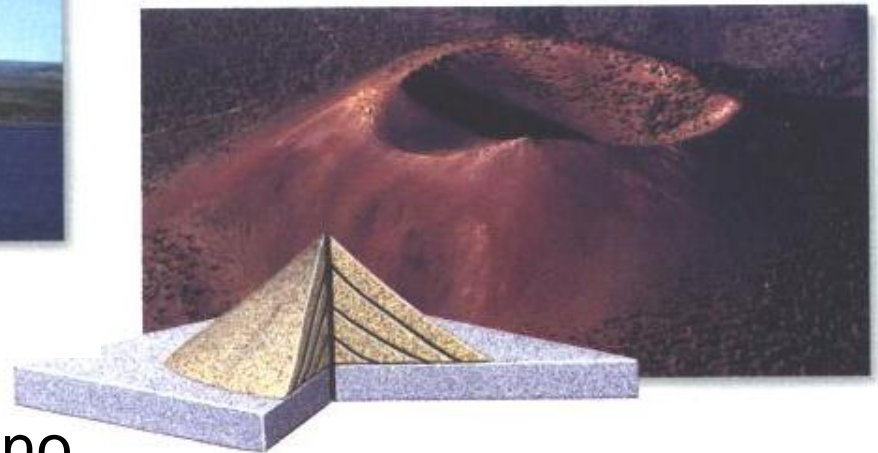


Types of Volcanoes

Shield volcano



Cinder cone volcano



Composite volcano



Craters, Calderas, and Lava Plateau

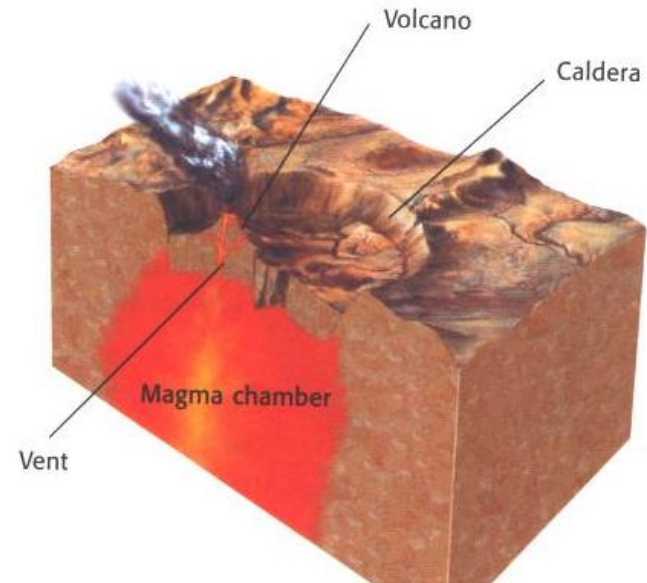
Crater

- From explosions of material out of the vent and the collapse of material back into vent



Caldera

- Much larger depression that forms when magma chamber empties and its roof collapses



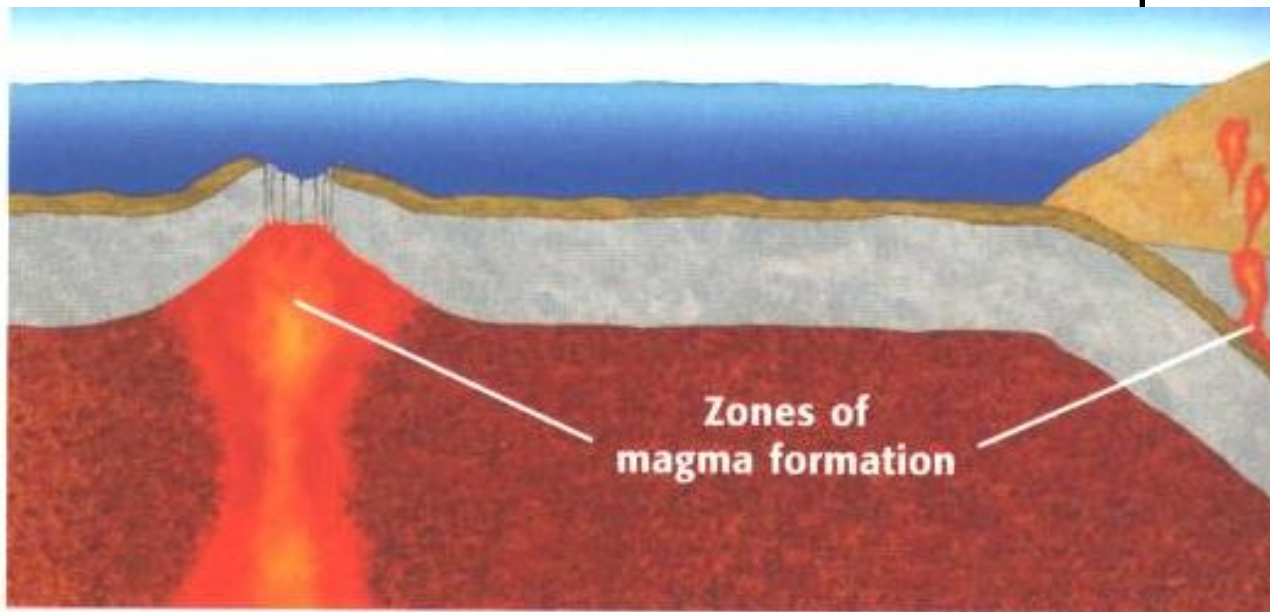
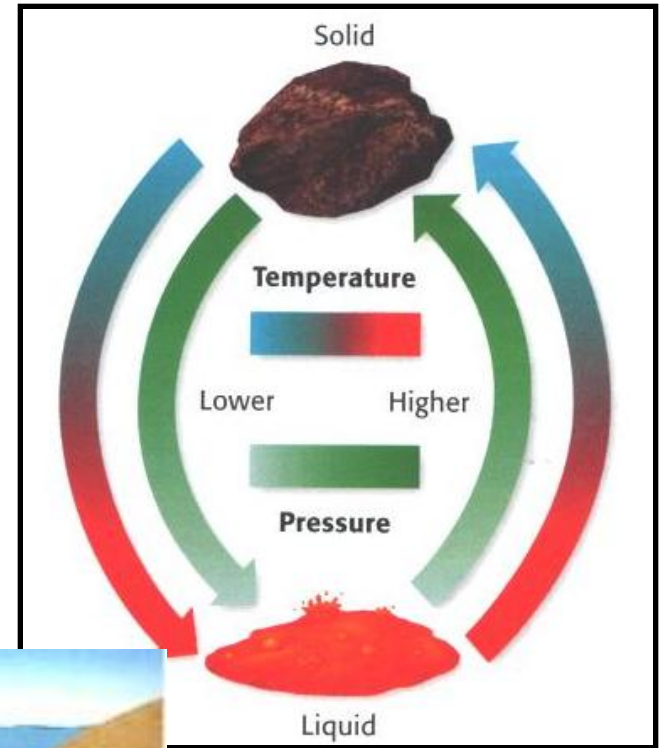
Lava Plateau

- Forms when lava erupts from long cracks, or fissures, and spreads out evenly (thousands of km)

What causes volcanoes?

The Formation of Magma

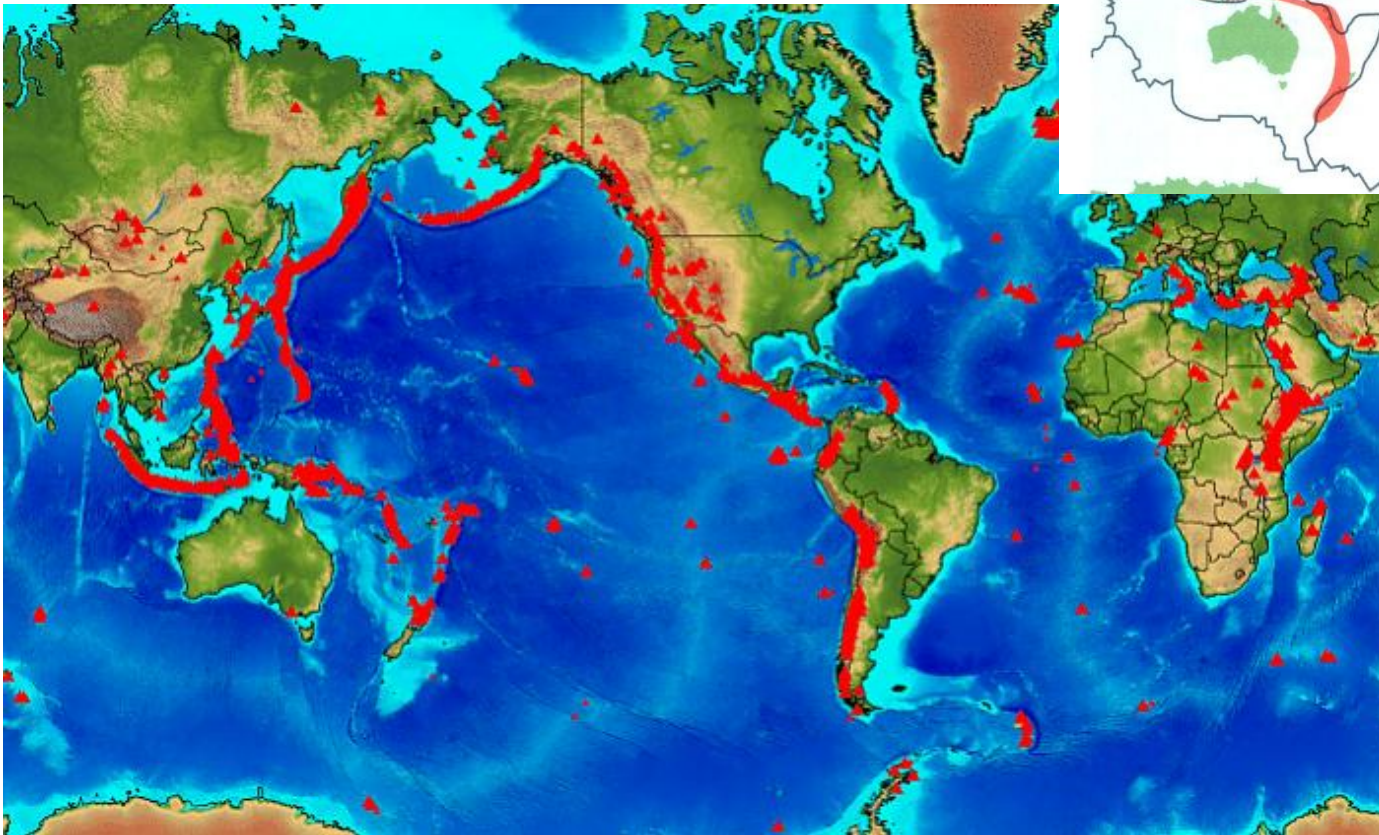
- Mantle rock melts when the temperature increases or the **pressure decreases**.



What causes volcanoes?

Where Volcanoes Form

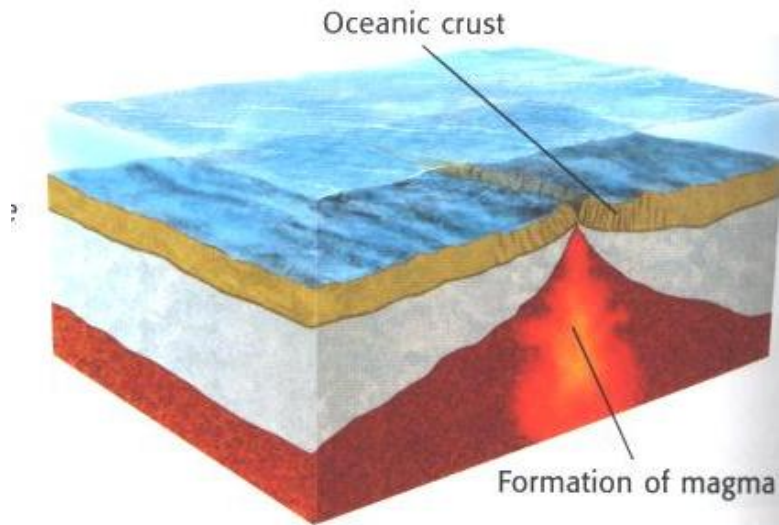
- Tectonic Plate Boundaries!!!



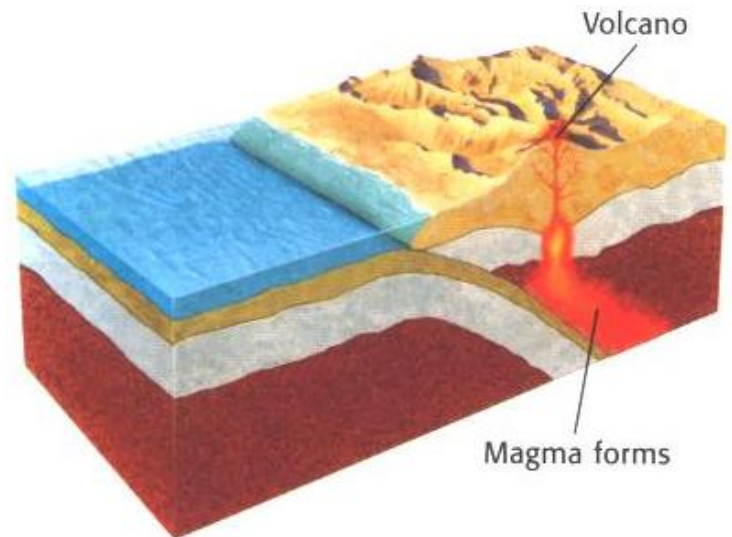
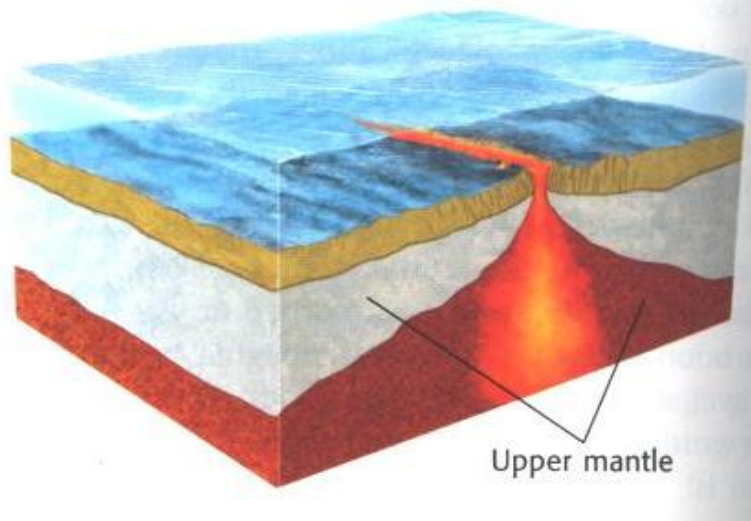
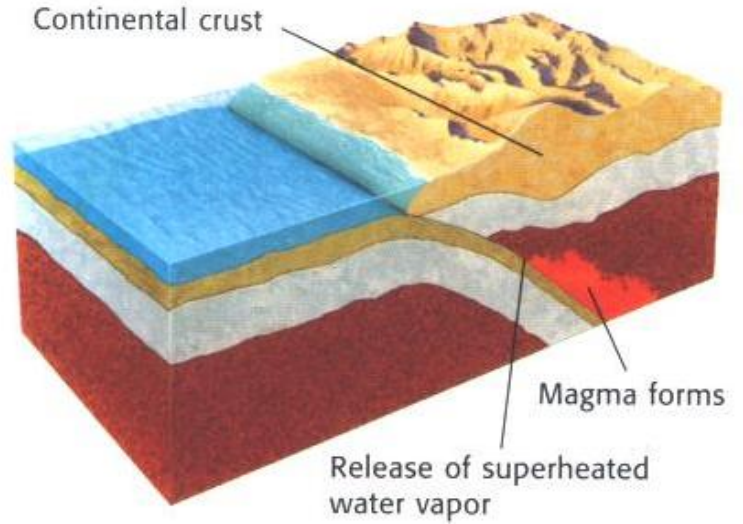
~75% world's active volcanoes in Ring of Fire

What causes volcanoes?

Boundary

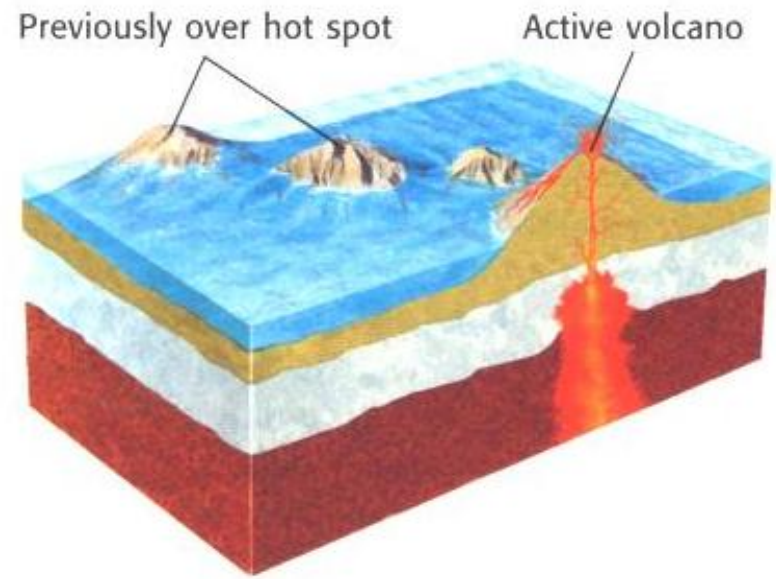
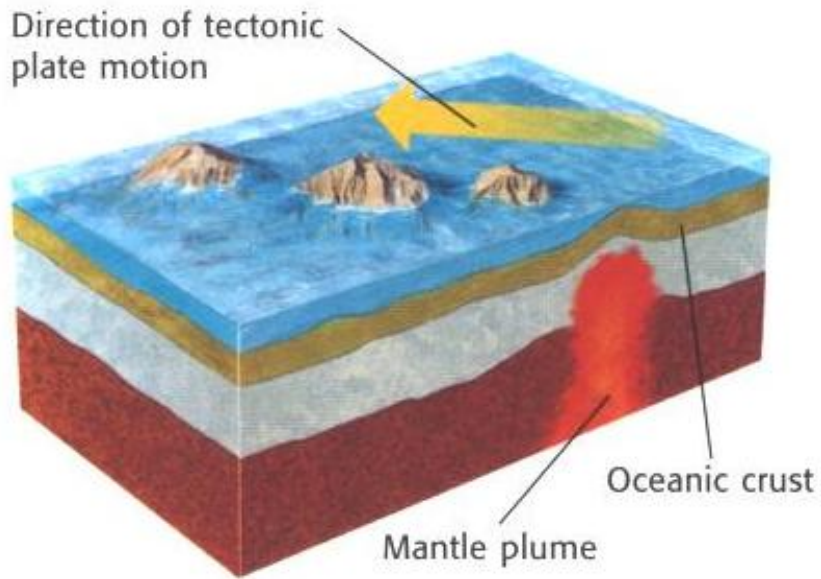


Continental crust



What causes volcanoes?

Hot Spots



How do volcanologists predict eruptions?

- **Measuring Small Quakes**
 - Before eruption, increase in number & intensity
- **Measuring Slope**
 - Bulges may form with magma (tiltmeter)
- **Measuring Volcanic Gases**
 - Outflow of volcanic gases
 - Sulfur dioxide, carbon dioxide
- **Measuring Temperature from Orbit**
 - Measure changes in temperature over time

You should not be a Volcanologist if....

- You don't like hiking, backpacking, rockclimbing, etc.

- You are not interested in experiencing extreme temperatures and heights.

- If you don't like to travel to incredible places and see breathtaking views of the world.



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- <http://video.nationalgeographic.com/video/101-videos/volcanoes-101>
- <http://abcnews.go.com/WNT/video/lava-force-evacuation-hawaii-homes-26470545>
- <http://abcnews.go.com/GMA/video/drone-camera-captures-dramatic-volcano-video-before-melting-25915186>