

# **Welcome to a Great Quiz!**

**Make sure you feel ready for this, by reminding someone around you of something you learned while studying.**

**Good luck!**

# Today's Agenda:

- Quiz
- Lesson: Volcanoes
- HW:

**Print Lab and Complete Pre-Lab Questions**  
(due in lab this week)

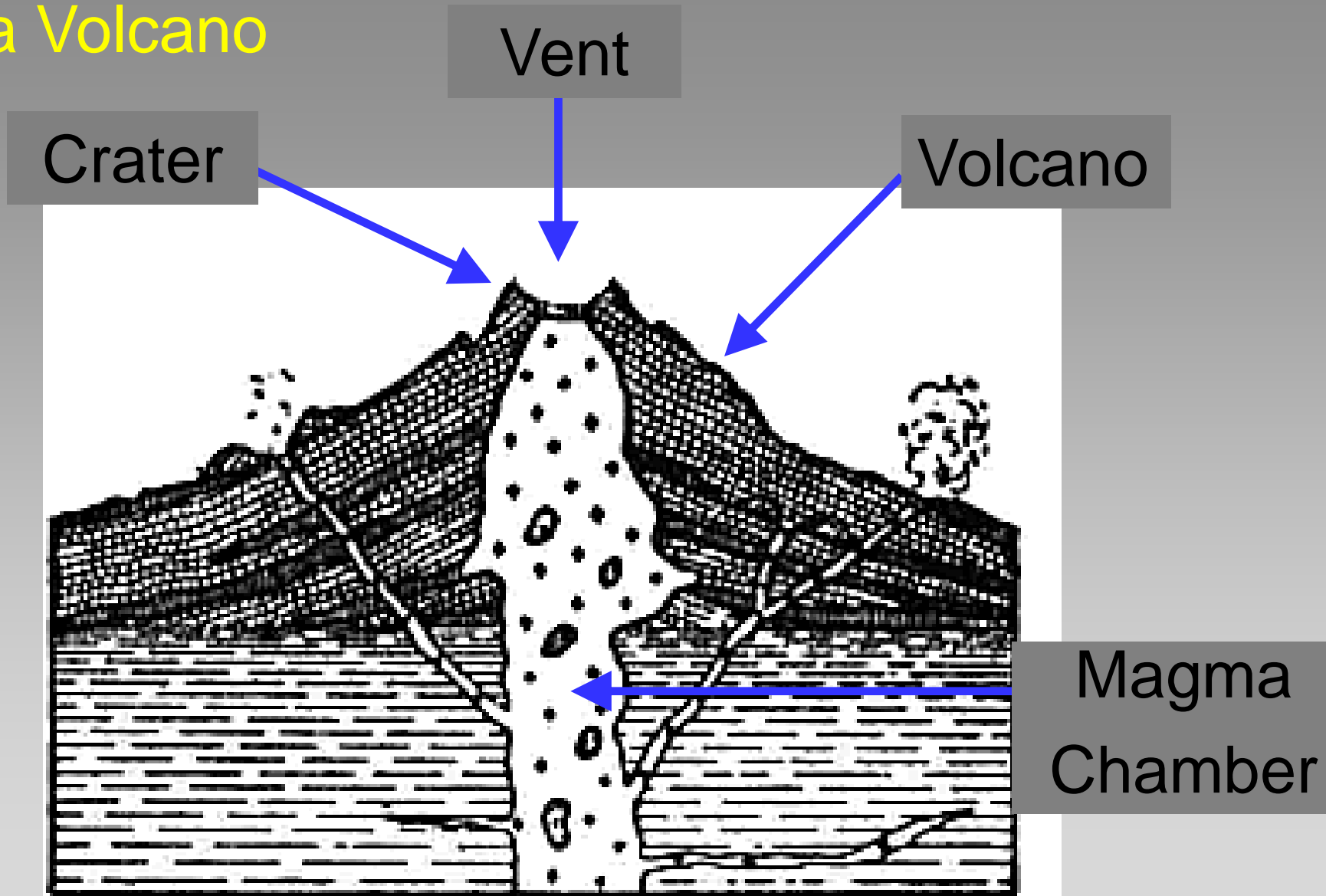
# Volcanoes

Evidence that Earth is  
Geologically Active

1. All volcanoes are fueled by magma deep beneath Earth's surface.
2. Magma meets crust
  - a. Magma = Mixture of molten rock, suspended mineral grains and dissolved gases deep beneath Earth's surface.
  - b. Formed when temperatures are high enough to melt the rocks involved.
  - c. Lava = Magma that has reached the Earth's surface

- d. The expansion of gases brings the magma closer to the surface and drives eruptions.
- The interaction between the viscosity and temperature of the magma and the gas content determines if an eruption will be effusive or explosive.
- e. Magma is **less dense** than its surrounding rock.
- f. This density difference causes magma to **move upward (float)** and eventually **come in contact (intrude)** with the crust

### 3. Anatomy of a Volcano

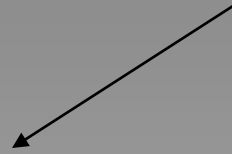


## 4. Emitted Volcanic Material:

Ash Cloud =

- i. Volcanic ash consists of tiny jagged pieces of **rock** and **glass**.
- ii. Falling ash can turn daylight into **complete darkness**.

## Volcanic Ash



b. Tephra =

Rock fragments thrown into the air during a volcanic eruption

c. Volcanic bomb =

Blob of lava that can harden in the air, or hit the ground then flatten and solidify



<http://www2.sfu.ca/soils/people/tephra.jpg>



<http://www.ngdc.noaa.gov/seg/image/titlethumb/73900210.jpg>



**Lapilli and bomb-sized pyroclastic material from Strawberry Crater, San Francisco Volcanic Field, Arizona**

<http://facweb.bhc.edu/academics/science/harwoodr/GEOG102/Study/images/volc1.jpg>

## 5. Pyroclastic flow:

- a. Mixtures of hot gas, ash, and tephra traveling very quickly down the slopes of volcanoes.
- b. They are the most dangerous hazard posed by volcanoes.
- c. They cannot be outrun by living things.



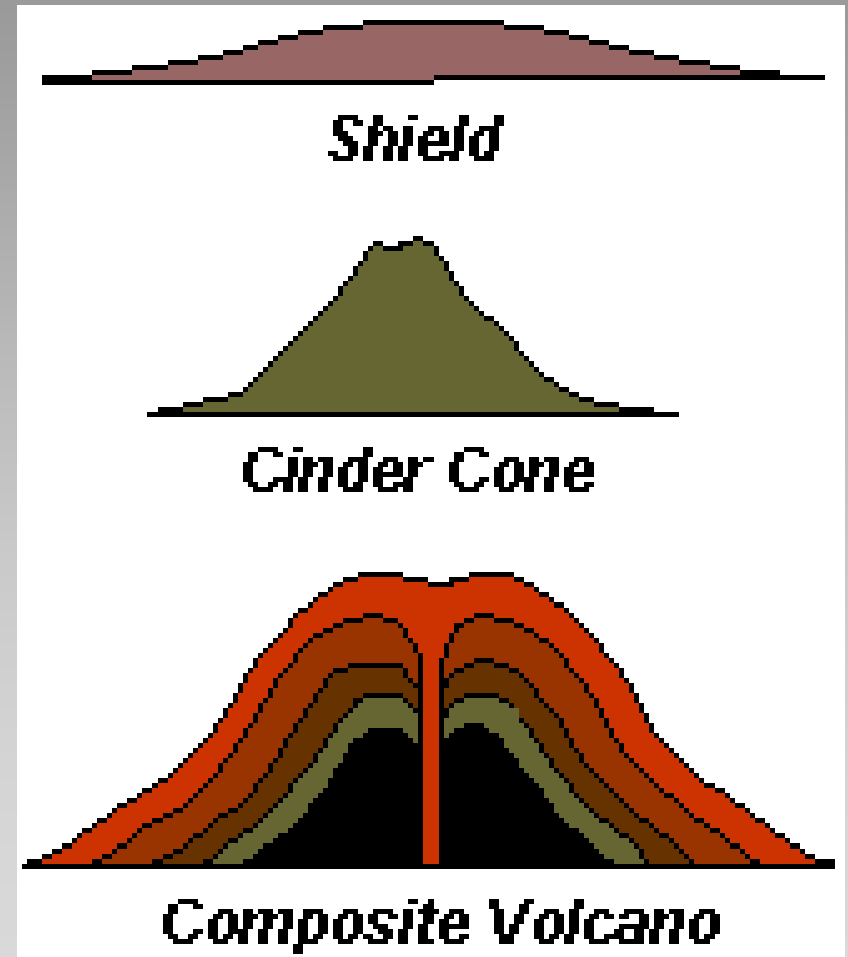
**Ash Cloud**

**Pyroclastic Flow**

Pyroclastic flows can travel at 200 km/hr and exceed 700°C!

## 6. Types of Volcanoes

- Based on
  - The material that forms the volcano
  - Type of Eruption that occurs
- Shield Volcanoes
- Cinder-cone Volcanoes
- Composite Volcanoes



## Shield Volcano

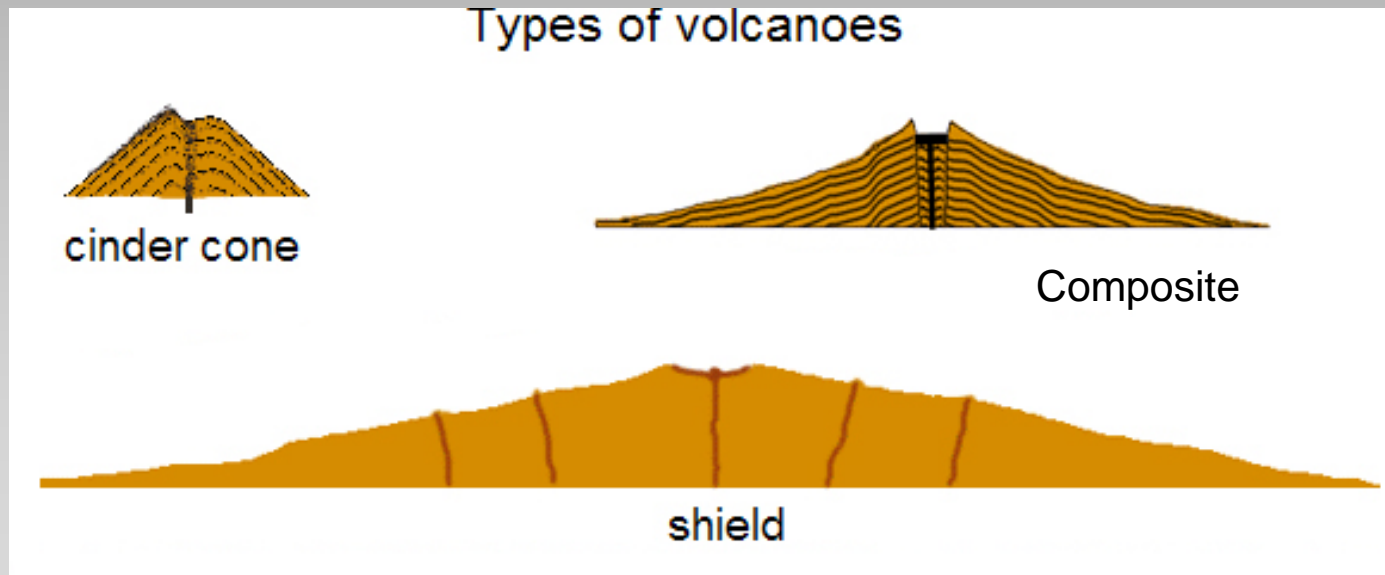
- The widest in size, w/ gentle sloping sides
- Least explosive
- Form as layers of lava accumulate from non-explosive eruptions

## Cinder Cone Volcano

- Smallest in size, w/ steepest sides
- Intermediate explosiveness
- Form when tephra falls back to Earth and piles around the vent

## Composite

- Tallest, w/ relatively steep sides
- Most dangerous; very explosive
- Form when layers of volcanic fragments alternate with lava



## 7. Where Do Volcanoes Form?

- a. 95% occur at **Convergent and divergent boundaries**.
- b. 5% occur far from plate boundaries at places called **hot spots**.
- c. Hot spots are unusually hot regions of the **mantle** that rise to the surface, melting **everything in its path all the way through the crust**
- d. The magma moves vertically but **NOT** laterally, and as a result, a trail of **progressively older** volcanoes form as the **plate** moves over a hot spot.

