

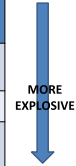
## Volcanoes



## 3 Types of Magma

- Viscosity: a liquid's resistance to flow  
– Ex. honey has a high viscosity

Type of Magma	Type of Rock Melted	Gas & Silica Content	Viscosity
Basaltic	Upper Mantle	Low	Low
Andesitic	Oceanic Crust	Medium	Medium
Rhyolitic	Continental Crust	High	High



## Eruptive Power Factors

- ♦ Temperature of magma
- ♦ Composition of magma
- ♦ Amount of dissolved gas in magma

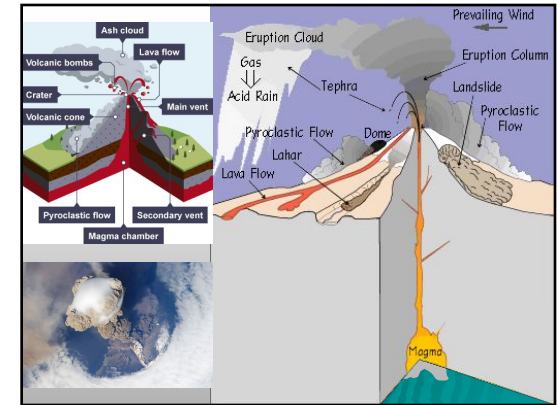
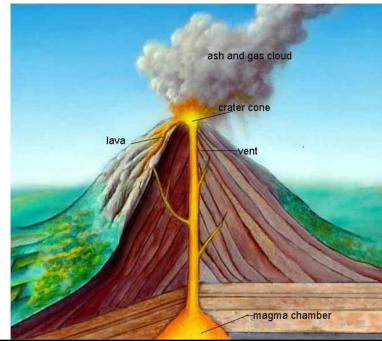
## Pyroclastic Material

- ♦ Pyroclastic – Cloud of ash and lava/rock fragments **EJECTED** from crater during eruption
  - 1) **Ash** – **Dissolved gases** in magma that expand and **eject** violently
  - 2) **Cinders** – Extrusive **igneous rocks** with many **cavities** and very low-density **ejected**
  - 3) **Lapilli** – **Molten** lava rock fragments **ejected**
  - 4) **Lava/Volcanic Bombs** – **Large** lava rocks **ejected**

**Lahar Flow** – **Mudflow** of molten rock, debris, and water down side of volcano; **NOT** pyroclastic

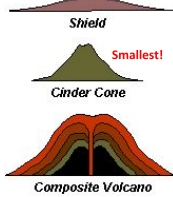
## Parts of a Volcano

- Magma
  - Vent
  - Crater
  - Lava
- What is the difference between magma and lava?



## 3 Types of Volcanoes

1. **Shield Volcano:** made from non-explosive basaltic lava
  - broad, gently sloping sides, circular base
  - Ex. Hawaii
2. **Cinder-Cone Volcano:** andesitic or rhyolitic magma is ejected high up into the air and falls back down piling up around vent.
  - Small, steep (concave) sides



## Shield Volcanoes



- ◆ Broad, **gently** sloping
- ◆ **Nonexplosive**
- ◆ Ex: **Hawaiian Islands**

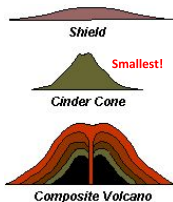
## Cinder-Cone Volcanoes

- ◆ **Small** and **steep** (cone) sides
- ◆ **Explosive** cinders
- ◆ Ex: **Izalco – El Salvador**

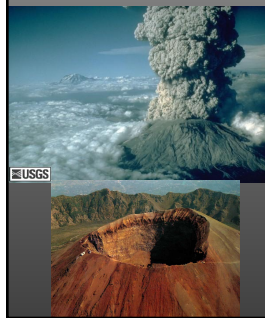


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3. **Composite Volcanoes:** layers of volcanic fragments alternate with lava; rhyolitic magma; very explosive
  - large, steep (concave sides)
  - Ex. Mount St. Helens



## Composite Volcanoes



- ◆ Also known as **stratovolcanoes**
- ◆ **Large**; cone-shaped; very **steep** slopes
- ◆ **Violently** explosive with **alternating lava & ash** layer
- ◆ Ex: **Mount St Helens – WA, USA**

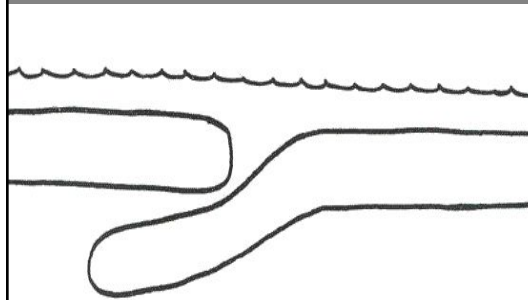
## What Type of Volcano?



# Volcanic Activity

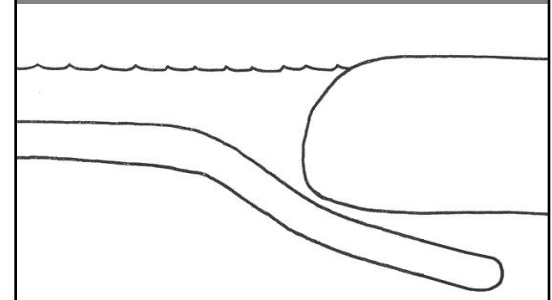
- ◆ **80%** - **Convergent** boundaries
- ◆ **15%** - **Divergent** boundaries
- ◆ **5%** - **Intraplate** activity: **hot spots**
  - Hot **mantle plumes** rising **within** plate
  - Ex: Hawaiian Islands

## Convergent **Oceanic-Oceanic**



**Volcanic Island Arcs**

## Convergent **Oceanic-Continental**



**Subduction Zone, Trench, Continental Volcano**

# “Ring of Fire”

- ◆ Horseshoe-shaped **belt of volcanoes** circling **Pacific Ocean**
- ◆ Formed from **subduction** (convergent) of **Pacific Plate** on all sides
- ◆ Home to **452** volcanoes (**350 active**)
- ◆ **90%** of world's earthquakes occur here (89% of largest EQ)

