



Types of Volcanoes

Objective: Explain how the explosiveness of volcanic eruption is related to the silica and water vapor content of its magma

I. What controls eruptions?

1. The amount of water and other gases trapped in the magma
2. How much silica (silicon and oxygen) is present in the magma







A. Trapped Gases

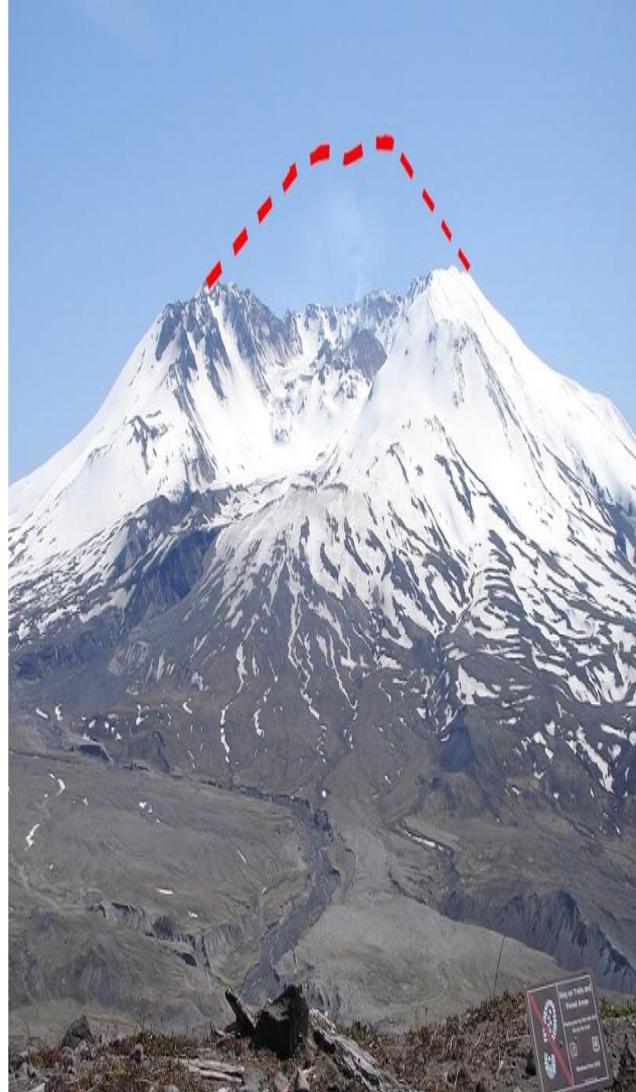


Water vapor and carbon dioxide are trapped in magma by the pressure of the surrounding magma and rock.

Gas that builds up to high pressure causes explosive eruptions

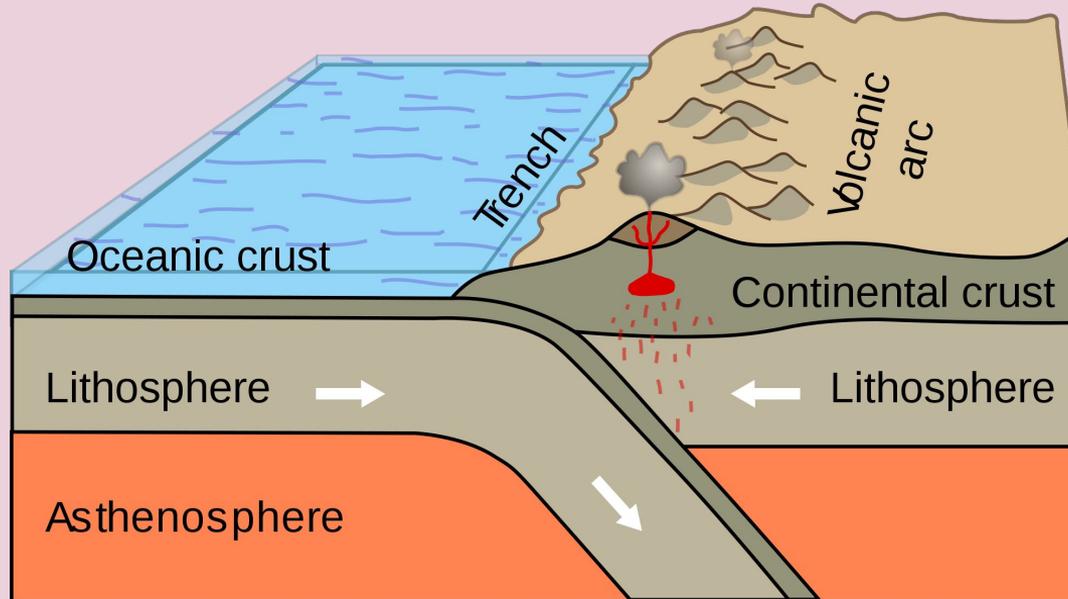
Mount St. Helen's - 5/18/80





B. Water Vapor

Occurs at oceanic plate boundaries



II. Composition of Magma

Silica Poor vs. Silica Rich



Three types of magma

Basaltic:

40 - 55% Silica and high in iron and magnesium

Quiet eruptions

Granitic

65 - 75% Silica and low in iron and magnesium

Explosive eruptions

Andesitic

55-65% Silica and high in iron and magnesium

Intermediate eruptions

A. Quiet Eruptions

Low in silica -
basaltic
magma



Three types of lava flows

Aa (AH-ah)

Carries scoria - rock



Pahoehoe (pa-HOY-hoy)

Fluid ropelike pattern



Pillow lava

Pillow-shaped lumps on the ocean floor



B. Explosive Magma

Silica Rich - magma is thick and traps gasses

Forms at convergent boundaries



III. Forms of Volcanoes

Depends on if the volcano is made up of basaltic, granitic or andesitic lava



Shield volcanoes

Cinder Cone Volcanoes

Composite Volcanoes



A. Shield Volcano

Quiet eruptions of basaltic lava

Broad volcano with gentle slopes - Hawaiian Islands, Kilauea and Surtsey



B. Cinder Cone Volcano

Explosive volcanic Granitic/Andesitic Tephra: bits of rock or solidified lava

Steep and narrow at the base

C. Paricutin in Mexico



D. Composite Volcano

Vary between quiet and explosive - alternates between lava a tephra flows

All three types of magma

High broad mountain like

Soufriere Hills

Mount Pinatubo

Vesuvius

Mt. Fuji



E. Violent Eruptions

Page 168 has a
list

Mt. Saint Helens,
Washington 1980



F. Krakatau

Erupted August 1883 in the Sunda Straits near Indonesia

- The island that the volcano was swallowed by the volcano
- Ash was found 840 KM from the site
- Area around the volcano was in darkness for 24 hours
- More than 36k people died - mostly from the tsunami
- Global temperatures were lowered for the next 5 years by 1.2 degrees C



