Volcanoes (I):

- Composition of Magma: Important to Nature of Volcanic Eruptions and Resulting Landforms.

- Explosive Eruption: Pyroclastics
  - Pinatubo, Philippines 1991
3 Eruption Types:

- Gaseous: Few Landforms
- Explosive: Viscous Magma
- Effusive: Fluid Magma - Basaltic - Lava

Fluid Basaltic Lava Flow Mauna Loa, March 1983

Magma Viscosity Analog
2 Types of Eruption Apertures:

- Fissures
- Vents

Basaltic Fissure Eruption, Hawaii 1983

Fissure Eruptions

- Basaltic: Fluid Lava
  - Flood Basalts With Many Feeder Dikes; Basalt Plateaus

Columnar Jointing
Basaltic Eruptions: *Fluid Lava*

- Shield Volcano (Hawaiian) - Flank Eruptions
- Hawaii 33,000 ft Relief; *Olympus Mons* = 80,000 ft
- *Late Eruptions from Mafic Magma Chamber may be Viscous*

Basaltic Shield Volcano
Mauna Kea, Hawaii

Shield Volcano

Basaltic Lava Flow

 Shield Volcano: Mauna Loa, Hawaii
Lava Tube, Hawaiian Volcanoes National Park

Pu‘u O‘o - Royal Gardens Aa Flow 1983

Kilauea Eruptions 1983-Date

181 Houses Destroyed
13 km of Road Buried
Pu‘u O‘o - Royal Gardens Aa Flow 1983

Kupaianaha Flow Meets Pacific, 1988

Rhyolitic Eruptions:
Viscous Magma & Pyroclastics

• Cinder Cones
• Lava Domes
• Minor Lava Flows
Tavurvur Volcano, New Guinea: Cinder Cone, Pyroclastics

Ashfall, Papua New Guinea, 1994

Cinder Cone: Mt. Etna, Italy
Viscous (Rhyolitic) Magma
May Occur in Late Eruption Phases of Intermediate Magma Chamber

Intermediate (Andesitic) Magma:
Composition Varies - Viscous to Fluid
• Small Cinder Cones & Flows Grow into....
• Composite Cones (=Stratovolcanos)
  – Composite of Flows & Pyroclastics