VOLCANOES

Homework due on Wed./Thurs.
I have a few copies left, or get by moodle or webpage

Icelandic Rift

Convergent plate boundary

Tectonics of Magma

- Basaltic magma
  - From partial melting of mantle
  - Occurs at oceanic ridges and mantle plumes
  - More dense: makes oceanic crust
- Granitic magma
  - From melting of crust, with water as flux
  - Occurs at convergent boundaries
  - Less dense: makes continental crust
Terms

- **Viscosity**: resistance to flow
- **Pyroclastic**: material blown into the air by volcanic eruption
- What is the relationship of lava viscosity to pyroclastic production by a volcano?
  - Greater viscosity = more likely to have pyroclastic material

Volcanic gas information below

Volcanic gas composition

Kilauea Summit Hot Spot 1170°C

CO₂
H₂S
S₂
H₂O


Erta' Ale Divergent Plate 1130°C

CO₂
H₂O
S₂
H₂S
HCl


http://en.wikipedia.org/wiki/Erta_Ale

Momotombo Convergent Plate 820°C

H₂O
S₂
H₂
HCl
H₂S
CO₂


http://upload.wikimedia.org/wikipedia/commons/6/6c/Momotombo.jpg

Shield volcano

http://volcanoes.usgs.gov/Products/Pglossary/ShieldVolcano.html

Pahoehoe


http://www.windows.ucar.edu/earth/geology/images/aapahoehoe_lg.jpg

Pahoehoe

http://news.cnet.com/2300-13576_3-10001182-2.html

A‘a

http://www.mistermoose.org/rtw/usa/hawaii/pahoehoe.html

Active Lava Tube

http://www.doubledeckerpress.com/skylight.htm

http://www.windows.ucar.edu/earth/geology/images/aapahoehoe_lg.jpg
Ring of fire

http://pubs.usgs.gov/gip/dynamic/fire.html

Nuee Ardente

St. Pierre Harbor, 1902

http://hpa.nos.noaa.gov/hurricanes/Martinique/Pelee/Pelee.MP/Pelee-MP-1902.jpg

Martinique

http://www.geology.sdsu.edu/how_volcanoes_work/Pelee.html

Video of nuee ardente: http://www.bedford.k12.ny.us/flhs/science/apes/images.html

http://www.geo.mtu.edu/volcanoes/west.indies/soufriere/govt/images/051296/pf_sea.mpg

St Helens Blast Zone

Lahar Mt

http://ve.ou.edu/weaver/st_helens/sthelens.htm

http://www.geology.sdsu.edu/how_volcanoes_work/Lahars.html

Link to Nevado del Ruiz

http://volcanoes.usgs.gov/Hazards/What/Lahars/RuizLahars.html

St Helens Deposits

http://ve.ou.edu/weaver/st_helens/sthelens.htm

http://www.geology.sdsu.edu/how_volcanoes_work/St.Helens.htm
Rainier Lahars

Paricutin

Pyroclastic material

Central vent filled with rock fragments

Volcanic features

- Fissure
- Pipe
- Vent
- Opening at summit may be crater or caldera
Aspects of volcano types

Crater Lake

Caldera initial stage

• Like Crater Lake

Caldera final stage

Collapse caldera formation

• Like Crater Lake

Kilauea Caldera

Kilauea Caldera—Stage 1

Kilauea Caldera—Stage 2

Kilauea Caldera—Stage 3

Formation of Crater Lake and Wizard Island

Collapse of Mount Mazama

STAGE 1
INFLATION BEGINS

Magma reservoir begins to swell.

STAGE 2
INFLATION AT PEAK

Magma reservoir inflates.

Stressed rocks inflate.

Distances and elevations increase.

STAGE 3
ERUPTION - DEFLATION

Volcano shape returns to normal.

Distances and elevations decrease.

Eruption.