We Will **ROCK** you!

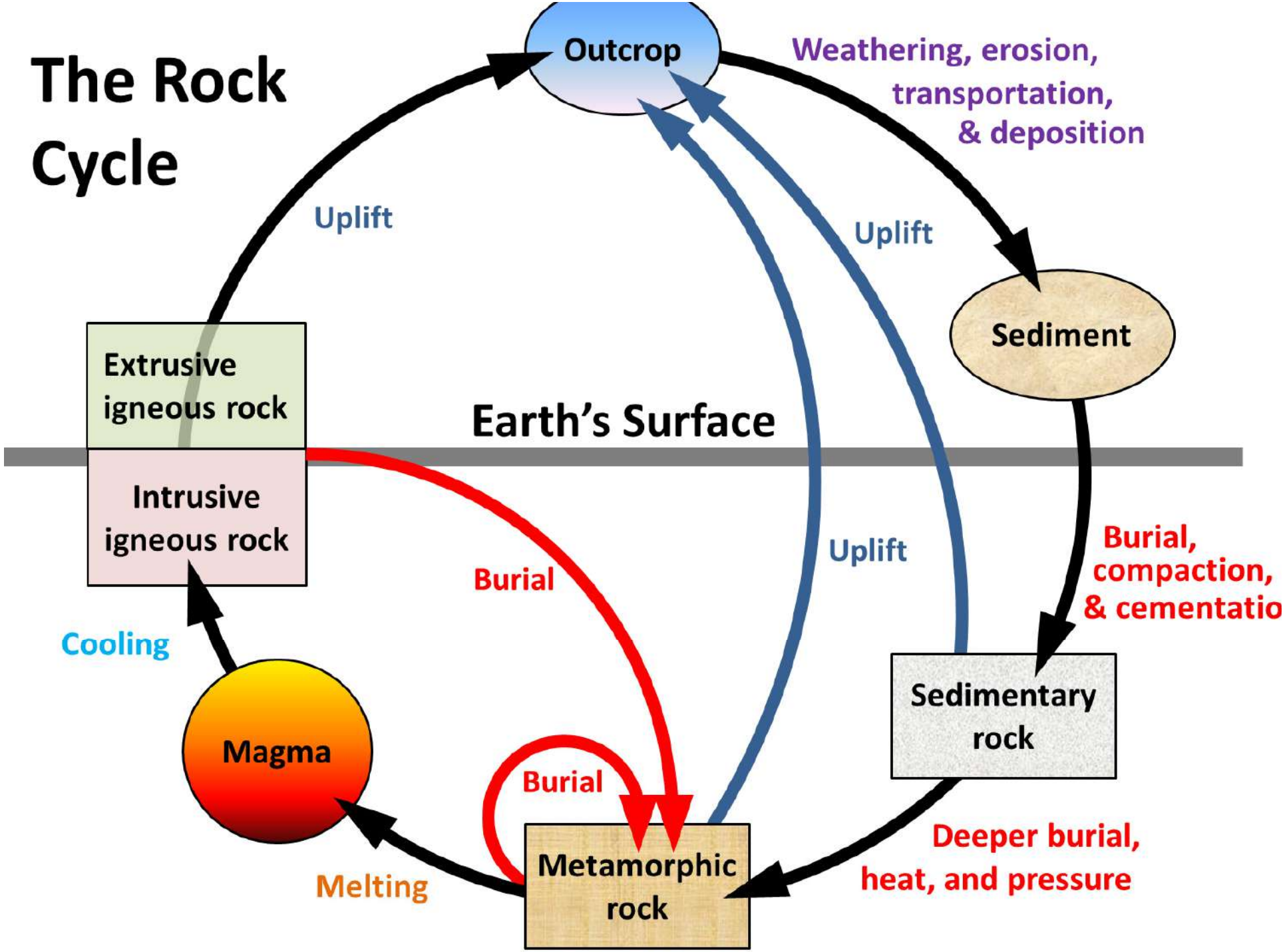
Chapter 6

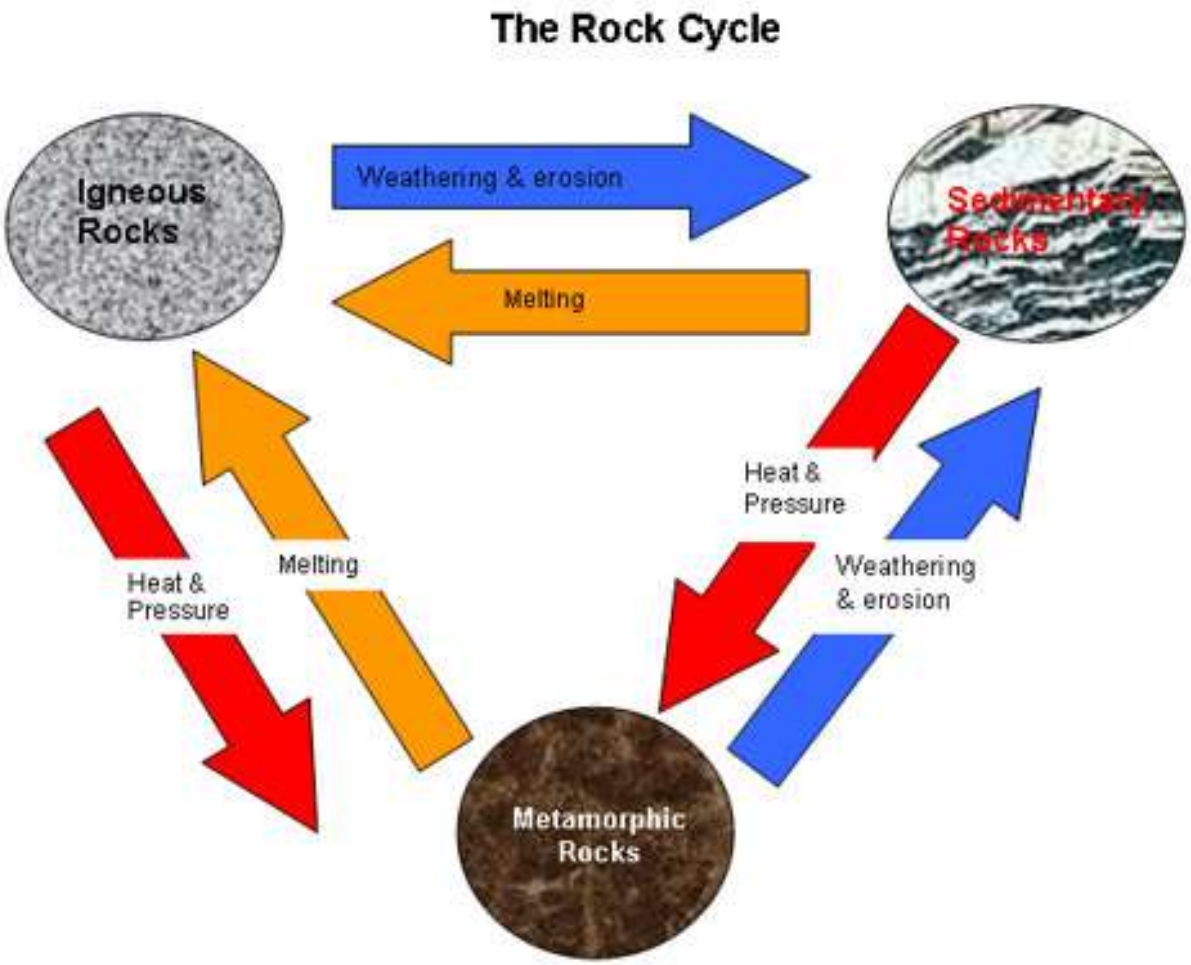
Rock Videos

- http://www.watchknowlearn.org/Video.aspx?VideoID=54740&CategoryID=7117
- http://www.watchknowlearn.org/Video.aspx?VideoID=51658&CategoryID=7117

Types of Rocks

- Rock: group of minerals bound together
- Found in Earth's Crust & mantle
  - Classified by which the process that they were formed
- **Igneous:** cooling/hardening of hot molten rock/magma f/ inside Earth
- **Sedimentary**-compaction/cementing of layers of sediments (rock fragments, plant & animal remains & miners that settle our of solution onto lake/ocean bottoms)
- **Metamorphic**- by effect of heat & pressure on other rocks


The Rock Cycle
Outcrop
Weathering, erosion, transportation, & deposition
Uplift
Uplift
Sediment
Extrusive igneous rock
Earth's Surface
Intrusive igneous rock
Uplift
Burial, compaction, & cementatio
Burial
Cooling
Sedimentary rock
Magma
Burial
Deeper burial, heat, and pressure
Metamorphic rock
Melting

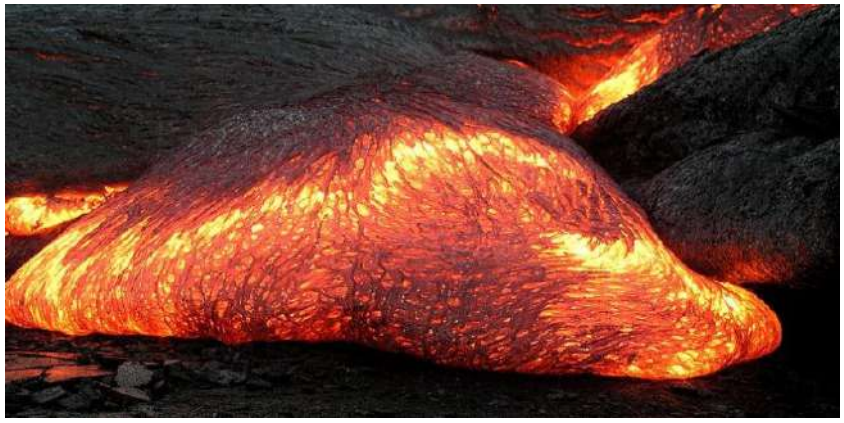

The Rock Cycle
Igneous Rocks
Weathering & erosion
Sedimentary Rocks
Melting
Heat & Pressure
Melting
Heat & Pressure
Weathering & erosion
Metamorphic Rocks

Igneous Rocks

- Classified by mineral composition & texture
- Some form from volcanic ash, most from magna- location of magma determines cooling rate and therefore texture.
  - Form underground- intrusive igneous rock
  - Form at/above Earth's surface- extrusive

Types of Magma

- Felsic- thick slow-moving magma
  - Large amounts of silica (SiO_2) smaller amounts of Ca, Fe & Mg
  - Hardens to light-colored silicate minerals like quartz, orthoclase feldspar
- Mafic- hotter, thinner, more fluid
  - Large amounts Fe & Mg, much lower silica
  - Usually contain large amounts dark silicate minerals such as hornblende, augite, biotite



Intrusive Igneous Rocks

- Deep w/in crust, hardens very slowly
- Appear @ surface after uplift + erosion of overlaying rock
- Coarse texture (granular, coarse-grained)

Extrusive Igneous Rocks

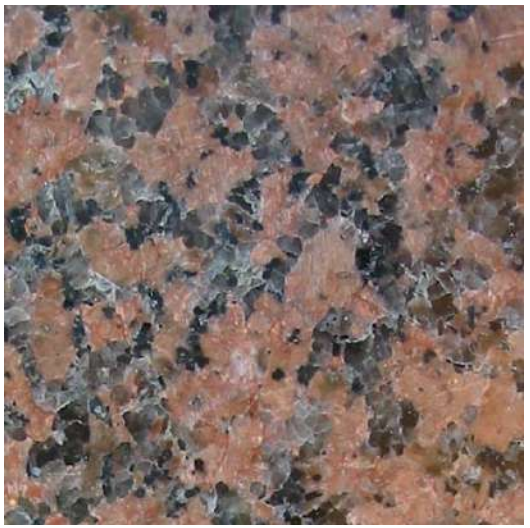
- At the surface!
- Lava= magma above surface
- Cooled/hardened = volcanic rock, extrusive igneous rock
- Hardens quickly (hours, days)
- Small crystals (not much time to form)
- Fine-grained texture or smooth (glassy)

Intermediates

- Porphyry- igneous rocks- large crystals (formed below) surrounded by fine-grained mass of rock (after forced up/cooled quickly)
- ash f/ volcanoes settles, buried/compressed into rock= tuff (sedimentary + igneous)

Granite Family

- Form from felsic magma
- Course-grained
- Usually white, gray to pink
- Intrusive
- Very common continental igneous
- Found in many mountainous areas



Examples

- Obsidian (chemical composition resembles granite)
  - Glassy texture
  - Volcanic rock (extrusive)
  - Moderately hard w/ conchoidal fracture, brittle dark brown/black (b/c iron oxide)
- Pumice- formed f/ silica-rich lava hardened as steam/gasses bubbled out
  - Resembles sponge
  - Often light enough to float
- Felsic (general name for any light colored, finegrained rock)
  - Ex. Rhyolite –fine-grained, light gray to pink

Gabbro Family

- Mafic rocks
- Dark colored denser than granite family
- Pyroxene, olivine, plagioclase feldspar = most prevalent minerals
- Course-grained

Examples

- Basalt (fine grained)
  - Composition of Gabbro
  - Dark gray or black
  - Makes ocean floor
  - Most common rock f/ lava flows
- Others: Diabase, basalt glass, scoria

Diorite Family

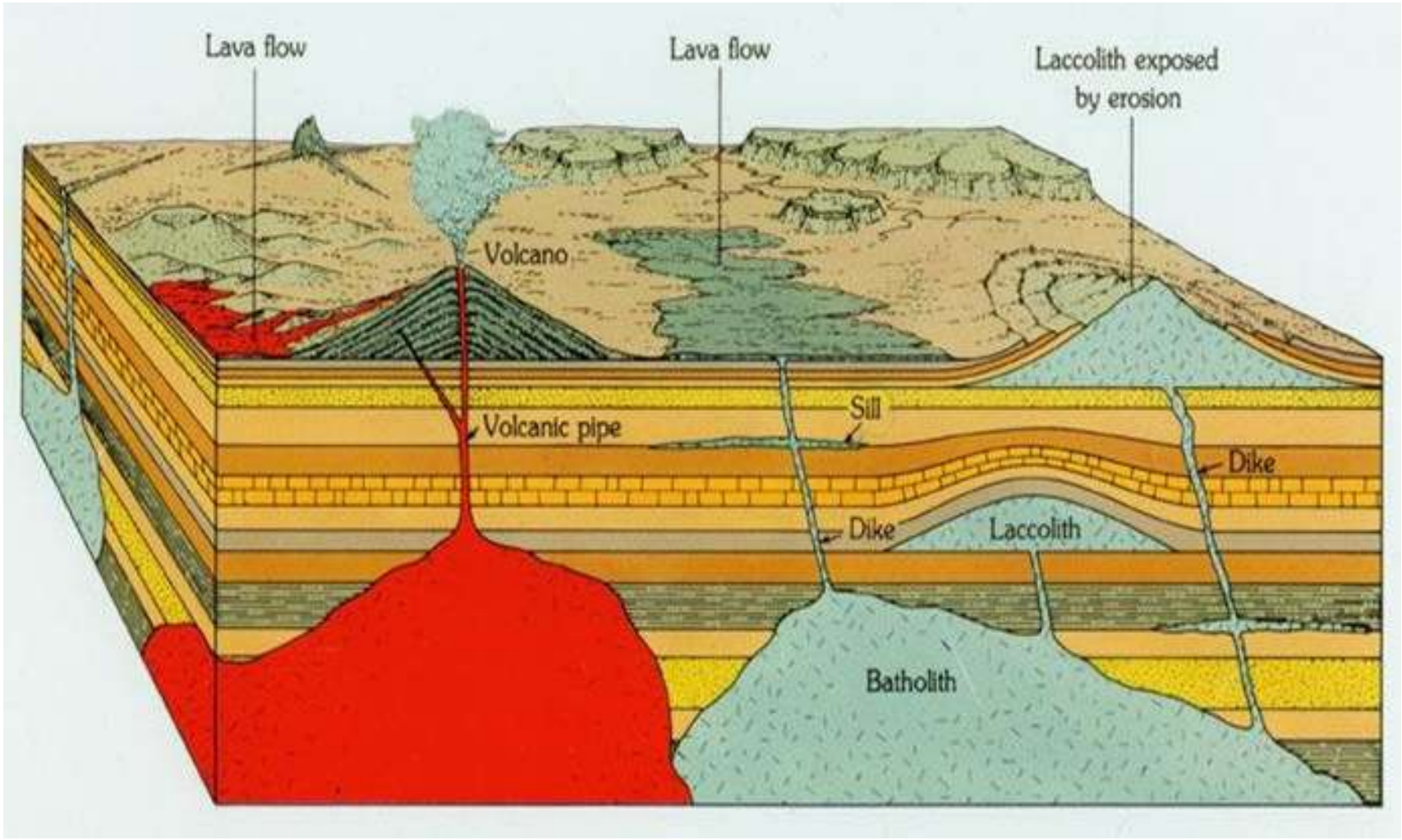
- Intermediate composition (characteristics of Gabbro & Granite)
  - Medium grays/ greens
  - Coarse-grained
  - Ex. Adesite

Igneous Intrusions

- Magma pushes up into fractures in bedrock or squeeze b/w rock layers forcing overlaying rocks to form domes
  - Large masses solidify and make up core of mountains
  - Pluton- any igneous intrusion- rock mass that forms when magma cools inside Earth's interior
    - Reaches Earth's surface after uplift, weathering

Plutons

- Dike- sheet igneous rock cuts vertically (or steep angle) across rock layers
- Sill- sheet of igneous rock lies parallel to layers
  - Forms b/w not across rock layers
- Laccoliths- domed masses
- Volcanic neck- left when inactive volcano erodes (central plug hardened magma after volcanic material around wears away
- Batholiths: Largest pluton; forms cores of mountain ranges


Lava flow
Lava flow
Laccolith exposed by erosion
Volcano
Volcanic pipe
Sill
Dike
Dike
Laccolith
Batholith