#12: Mineral

- Occurs in Nature
- SOLID
- Inorganic (not from a plant or animal)
- Crystalline (forms crystals)
  - Atoms / Molecules bond in a regular pattern
- Regular Composition
  - EX- Halite (salt) is always NaCl

    Quartz is always SiO_2

#12B: Mineral Properties

- **CRYSTAL FORM-** (geometric shape of crystal)
- **HARDNESS-** (resistance to scratching)
  - Scale of 1-10 (talc-diamond)
- **STREAK-** (color of mineral as powder by rubbing a porcelain tile)
- **LUSTER** – light reflectiveness / shine
  - Metallic or Nonmetallic
- **CLEAVAGE**- mineral has blocky flat surfaces
  - **Fracture** – breaks irregular / no cleaveage

13: Rocks

- Aggregates (mixtures) of one or many ***MINERALS***

- Come from the solid outer layer of Earth
  - **LITHOSPHERE**
    - Aka "CRUST"

#14: IGNEOUS Rock

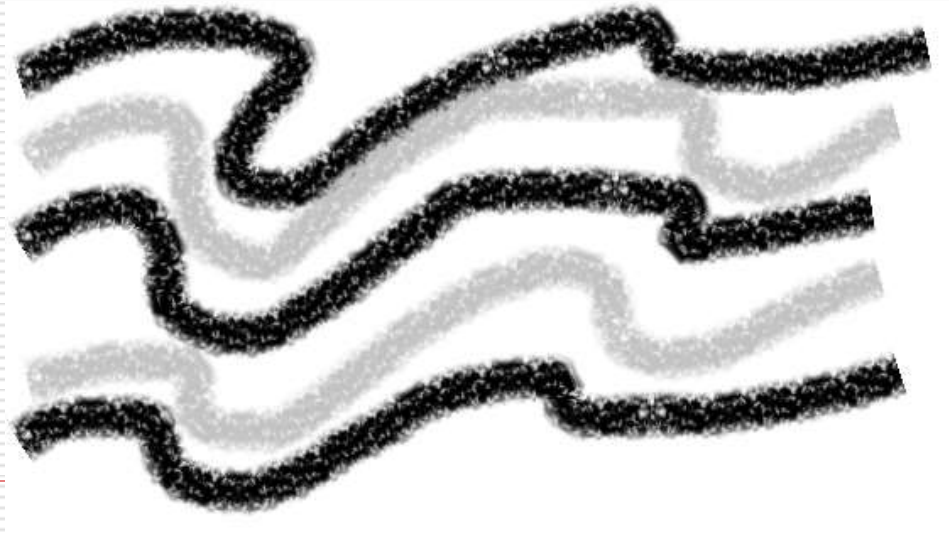
- Formed from COOLED / SOLIDIFIED molten (liquid) rock
  - **Magma** –
    - UNDERGROUND **INTRUSIVE**
    - cooled *SLOW -Big* Crystals
      - ***COARSE GRAINED***
  - **Lava**
    - VOLCANO **EXTRUSIVE**
    - *Tiny* Crystals – cools *Fast*
      - ***FINE GRAINED***
    - Can have "Gas Pockets"

#15: SEDIMENTARY Rock

- Layers of sand / mud or bits of rock sediment
  - **COMPACTED and CEMENTED**
    - At the bottom of lakes / seas / oceans
  - May have **FOSSILS**

#16: METAMORPHIC Rock

- Any rock changed or RECRYSTALLIZED by
  - **HEAT and PRESSURE**
    - Deep inside Mountain
      - Mineral Foliation / BANDING



#17: ROCK CYCLE

- Any rock can be changed into any other rock type
- Solid material of the Crust is continuously recycled:
  - **WEATHERED** into Sediment
  - **MELTED** into molten rock
  - **METAMORPHOSED** by **heat and pressure**

#18: WEATHERING

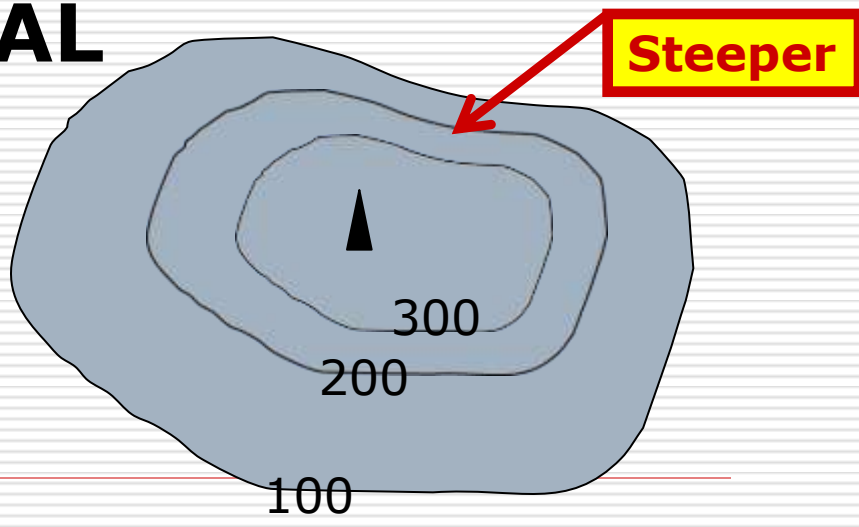
- **BREAK UP** of rock into smaller and smaller pieces / fragments (**sediment**):
  - **CHEMICAL WEATHERING-**
    - ***Acid Rain*** **dissolves Calcite** (Limestone and Marble)
    - **Oxygen** (rusts minerals with Iron)
  - **PHYSICAL WEATHERING-**
    - **Ice –** expands cracks rock**, "frost action"** *(potholes)*
    - **Waves / Rivers –** smooths and rounds
    - **Plants –** roots can lift and crack

#19: EROSION

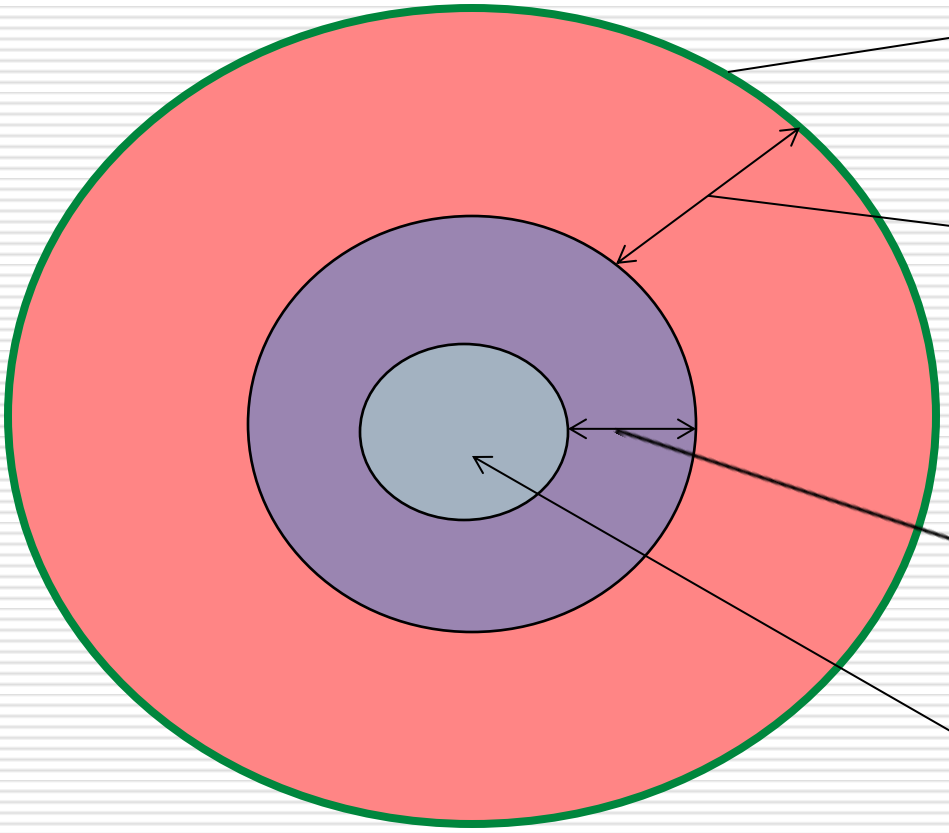
- When Sediments are – TRANSPORTED / MOVED by:
  - **GLACIERS**
  - **RIVERS**
  - **WIND**
  - **WAVES**
- Driven by force of **GRAVITY**

: Topographic Maps

- Map that shows **ELEVATION** or height above sea-level.
- Each line represents a height
- The amount each line goes up is the **CONTOUR INTERVAL**
- Ex:BALD HILL
  - Contour Interval 100ft



#20 : Structure of Earth



Lithosphere /
"Crust"
- Solid Rock / Plates
- (apple skin)

Mantle- Soft but not melted
- (amorphous)
- Convection

Outer Core-
Liquid Iron

Inner Core –
Solid Iron and Nickel

#21: Plate Tectonics

- The crust of the Earth is broken into sections – **PLATES**
- They shift and move as they ride atop the fluid / **Convecting MANTLE**
- Where the plates join form:
  - **VOLCANOES**
  - **MOUNTAINS**
  - **EARTHQUAKES**

#22: Evidence of **Continental Drift**

- "Puzzle Fit" of continents shape
- Things MATCH when put back together
  - FOSSILS
  - MOUNTAINS
  - ROCK TYPES
  - Glacial / climate records
- SEA-FLOOR Spreading – youngest rock in the middle of ocean, older near continents

#23: ASTHENOSPHERE

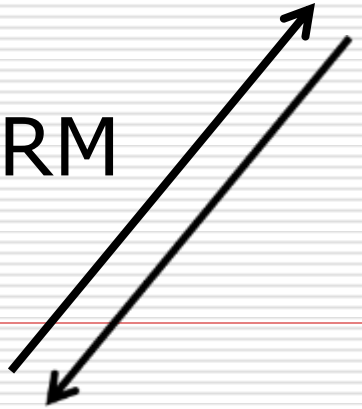
- Top of the Mantle
- Very soft and fluid rock
- Flows / **CONVECTION** Currents
- Moves the plates as they float on top

#24 : Plate Boundaries

CONVERGENT

DIVERGENT

TRANSFORM

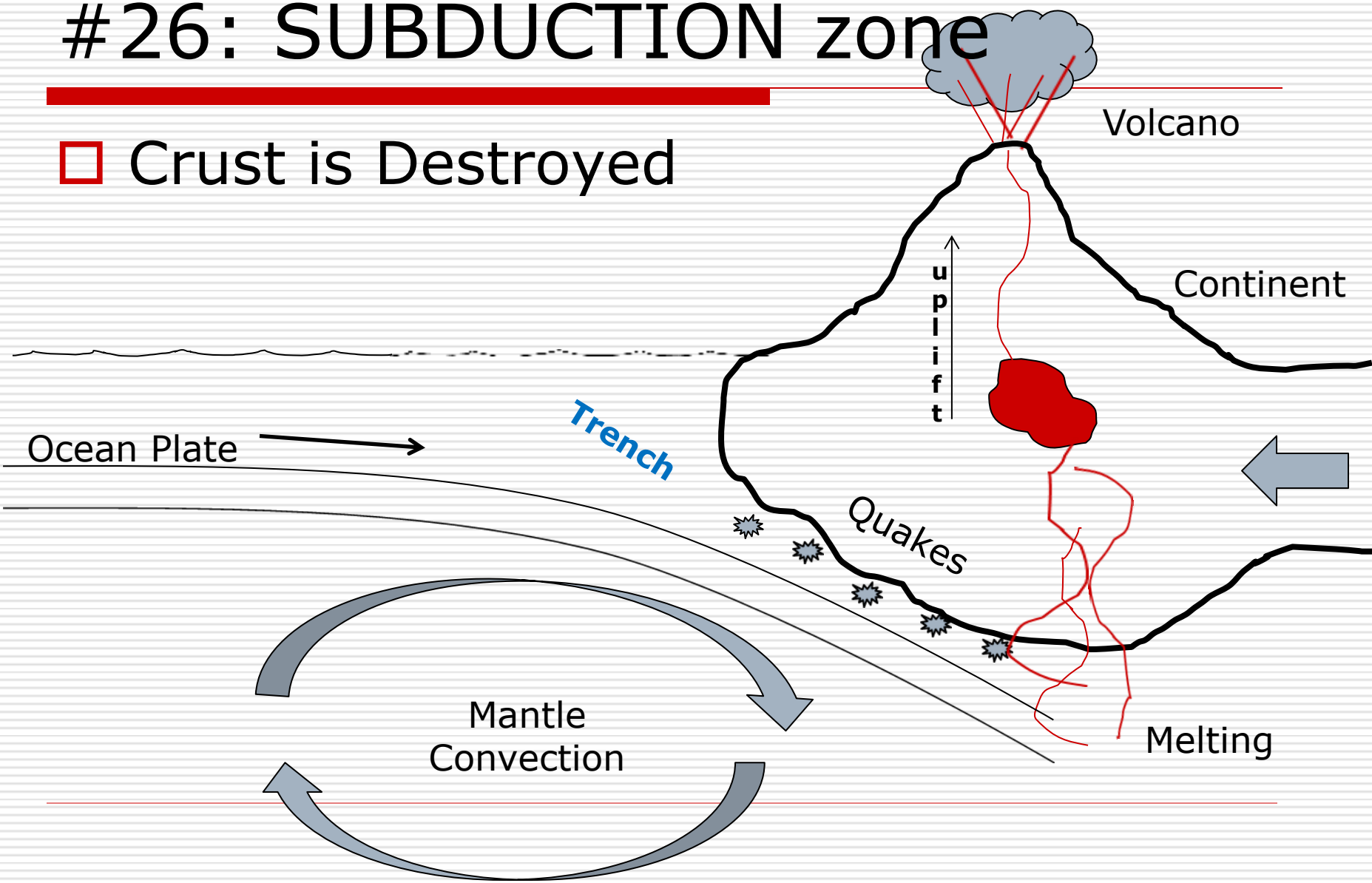


#25: “Ring of Fire”

- Ocean crust is being **Subducted** under the Continents by continuous **Convergence** all around the Pacific Ocean, which is lined completely by MOUNTAINS, EARTHQUAKES and VOLCANOES

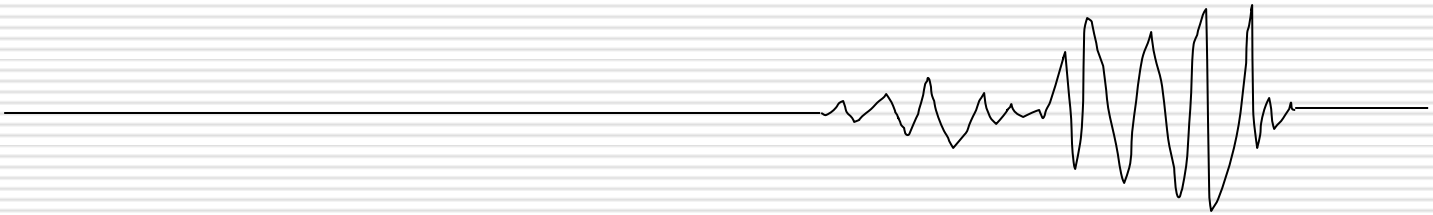
#26: SUBDUCTION zone

- Crust is Destroyed



#27 : Seismic Waves

- Waves of energy that travel through the entire Earth from Earthquake Faults.
- Measured by Seismograph readings

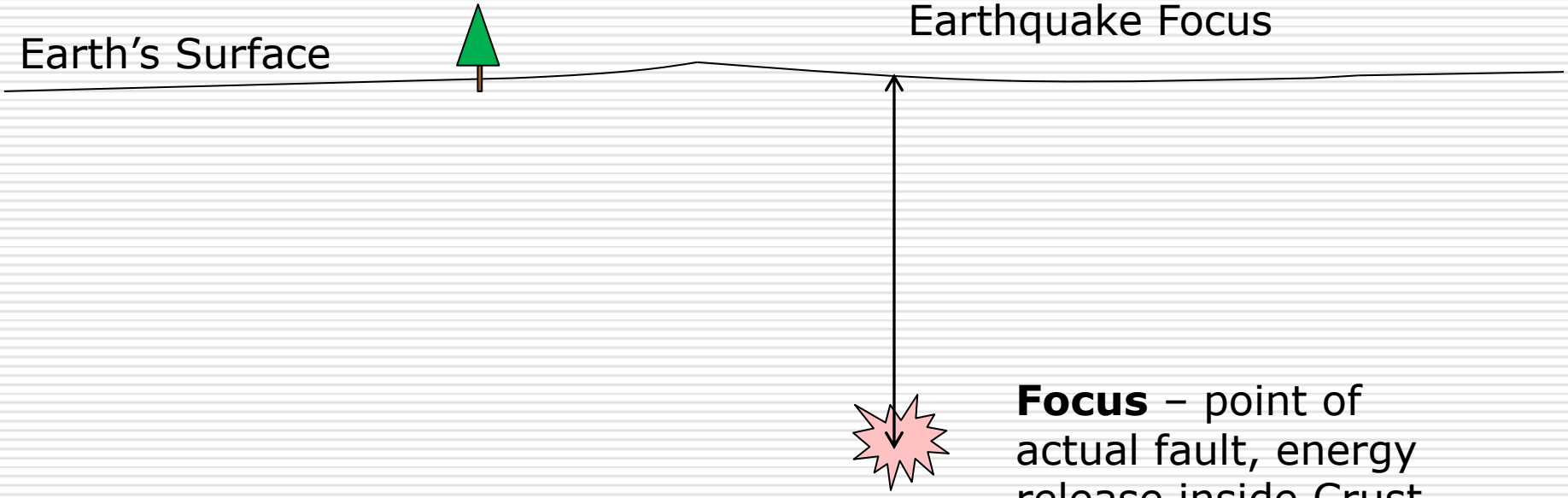


- Seismologist – study Earthquakes
- Tell us about Earth's interior
  - **Crust, Mantle, Core**

#28: Earthquake Scales

- Richter Scale
  - MEASURE OF ACTUAL ENERGY / POWER THE EARTHQUAKE RELEASED
- Mercalli Scale
  - MEASURES EARTHQUAKE POWER BY LEVEL OF DEVASTATION TO BUILDINGS AND STRUCTURES
  - FLAWED BECAUSE DISTANCE TO EPICENTER OF MAN MADE STRUCTURES NEVER THE SAME

#29: Focus / Epicenter



Epicenter – location on the surface directly above the Earthquake Focus

Focus – point of actual fault, energy release inside Crust

#30: Volcanic Winter

- When Volcanoes erupt, ASH (powdered rock) goes into the Atmosphere and spreads around the world, these particles reflect / blocks sunlight.

- Causes GLOBAL COOLING, drop in worldwide temperature

#31: Latitude

#32: Longitude