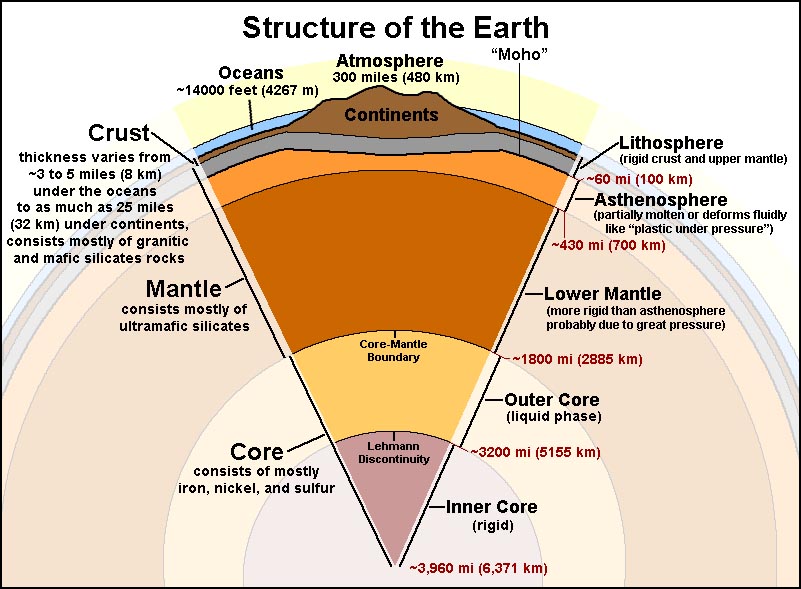
NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Unit Notes Earth Forces and Changes

* Chemical Composition of the Earth
  + Earth is divided into three compositional layers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Crust
    - The outermost layer of the earth
    - Ranging from 5 – 100 km thick
    - Made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Thinnest layer on earth
    - Two types of crust
      * Continental\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ composition
      * Oceanic\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ composition
  + Mantle
    - Layer between crust and the core
    - Extremely thick and contains most of the \_\_\_\_\_\_\_\_\_\_ of the earth (67%) or 2900 km thick
    - Made mostly of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - No one has ever seen what the mantle looks like
  + Core
    - Extends from the bottom of the mantle to the center of the earth
    - Core is made of iron, nickel, sulfur and oxygen
      * This was determined because on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ passing through the core
    - The diameter is the size of the planet Mars
* Physical Composition of the Earth (divided into 5 layers)
* LAMOI
* The structure of the earth is made of 5 physical layers:
  + Lithosphere
  + Asthenosphere
  + Mesosphere
  + Outer Core
  + Inner Core
* Lithosphere
  + Outermost rigid layer of the earth
  + Made of the crust and the upper mantle
  + Divided into pieces called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Divisions are the continents and the ocean basin
* Asthenosphere
  + A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the mantle where pieces of the lithosphere move
  + Made of solid rock, looks like putty, moves slowly
* Mesosphere
  + “middle sphere”
  + Hot and stronger than the asthenosphere due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Outer Core & Inner Core
  + Outer-liquid layer
  + Inner-solid layer of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

LET’S DRAW THEM TOGETHER:



Representing:

Representing:

3

2

8

7

6

5

4

1.

* Tectonic Plates
  + Pieces of the lithosphere that move on top of the Asthenosphere
  + Fit together like the pieces of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + 10 major tectonic plates
    - Not always divided on continental lines!!!
* Mapping the Earth
  + Since no one has ever even drilled through the crust, how do we know about the earth’s structure?
    - Seismic waves!
      * When an earthquake occurs, vibrations of seismic waves are produced and travel at different speeds depending on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the earth’s material
* 7-2 Continental Drift
* Alfred Wegener-
  + Proposed the idea of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the early 1900’s
  + This theory stated that continents can drift apart from one another and have done so in the past
  + Explains why fossils of the same plants and animals are found on different continents separated by oceans
* Pangaea
  + Pangaea is the great landmass occurring about \_\_\_\_\_\_\_\_\_\_\_\_\_ million years ago
  + Broke up into two big pieces 180 million years ago
    - Called Laurasia (North) and Gondwana (South)
  + 65 million years ago Laurasia and Gondwana broke up into smaller pieces:
    - South America, North America, Eurasia, Africa, India, Australia and Antarctica
    - <http://www.scotese.com/pangeanim.htm>
    - <http://education.sdsc.edu/optiputer/flash/pangea_4.htm>
* Sea Floor Spreading
  + The process of creating new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as older materials are pulled away.
  + Tectonic plates move away from each other, the sea floor spreads apart and magma rises to fill in the gap
  + The oldest crust in the Atlantic ocean is found along the edge of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* 7-3 Plate Tectonics
  + Plate tectonics is the theory that the earth’s lithosphere is divided into plates that move around on top of the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Causes of plate tectonics-FORCES
  + Ridge push- oceanic lithosphere is higher than continental lithosphere and \_\_\_\_\_\_\_\_\_\_\_\_slides down the boundary
  + Convection-hot material rises while cooler material \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Slab Pull-oceanic lithosphere denser than Asthenosphere, edge of oceanic plate sinks and pulls the rest of the tectonic plate
* Boundaries
  + Convergent-when tectonic plates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ one another
  + Divergent-when tectonic plates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from one another
  + Transform-when tectonic plates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ one another horizontally
* Deformation
  + Stress-the amount of force per unit are that is put on a given material
  + Deformation-when rock changes its shape due to\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Rock layers can bend when stress is placed on them
    - Or they can break
  + Compression-type of stress that occurs when an object is squeezed, when two tectonic plates collide
    - Rocky Mountains and the Cascade Range
    - Tension-stress occurring when forces act to stretch an object
* Folding
  + Occurs when rock layers bend due to stress
  + Assume that sedimentary rock layers are horizontal, so any time there is a fold, a deformation has taken place
  + Two common types: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Faulting
* The surface along which rocks break and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ each other
  + - Normal Faults
    - Reverse Faults
    - Strike Slip Faults
  + Normal Faults
    - The normal fault causes the hanging wall to move down relative to the footwall
    - Occur when tectonic plates cause tension that pulls rocks apart
  + Reverse Faults
    - Causes the hanging wall to move up relative to the footwall or the reverse of a normal fault

DRAW THEM:

NORMAL

REVERSE

STRIKE SLIP

* + - Occurs when tectonic plates causes compression pushing the rocks together
  + Strike Slip Faults
    - Occurs when opposing forces cause rock to break and move horizontally
* Mountain Building
* Three of the common types of mountains
  + Folded
  + Fault block
  + volcanic
* Folded mountains
  + Form when rock layers are squeezed together and pushed upwards
  + Examples: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Fault Block
  + Form when large blocks of the earth’s crust drop down relative to other blocks
  + examples: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Volcanic Mountains
  + Form when molten rock erupts onto the earth’s surface
  + Tend to form over the types of convergent boundaries that include subduction zones
  + Examples: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Earthquakes
* What are earthquakes?
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-branch of science devoted to earthquakes
    - Seismologists-study earthquakes
* Where do they occur?
  + Near the edges of tectonic plates
* Why?
  + Because tectonic plates move in different directions and at different speeds
  + As a result of this, \_\_\_\_\_\_\_\_\_\_\_occur
    - Fault-a break in the Earth’s crust along with blocks of the crust which slide relative to one another
* Faults
  + Occur near the\_\_\_\_\_\_\_\_\_\_ of tectonic plates
* Causes of Earthquakes
  + As tectonic plates pull, push or scrape against one another, stress builds up and the rocks in the plates deform
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-the change in the shape of rock in response to stress
* Deformation
  + Occurs in two ways:
    - 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ deformation-like a piece of putty, does not lead to earthquakes
    - 2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ deformation- like a rubber band, does lead to earthquakes
      * You can stretch a rubber band only so far before it breaks and when it does break, it releases energy and the broken pieces return to the un-stretched shape= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Earthquakes

|  |  |  |
| --- | --- | --- |
| * **Plate motion** | * **Fault type** | * **Characteristic of earthquake** |
| * Transform | * Strike-slip | * Moderate, shallow |
| * Convergent | * Reverse fault | * Strong, deep |
| * Divergent | * Normal fault | * Weak, shallow |

* Earthquakes Travel
  + Seismic waves are energy that travel through the earth
    - Seismic waves that travel through the earth are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Two types of body waves
        + 1.P waves-primary waves
        + 2. S waves-secondary waves
    - Seismic waves that travel along the earth’s surface are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Primary Waves
  + Primary waves are body waves
    - Pressure waves
    - Travel through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Are the fastest seismic waves
    - Travel ahead of the other seismic waves
    - First to be detected
* Secondary waves
  + Also body waves
  + Are shear waves
  + Second fastest seismic waves
  + Shearing stretches rock sideways from side to side
  + Cannot travel through\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Are slower than P waves
  + Always arrive second
* Surface Waves
  + Move the ground up and down in circles as the waves travel along the surface
  + Feels like they are on a roller coaster
  + Are more slow than body waves
  + Are more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than body waves
* 7-2 measurement
  + Seismographs-instruments located at or near the surface of the earth that record \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Seismogram-tracing the earthquake motion created by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Where did it happen
  + Seismograms are used to find an earthquake’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-the point on the earth’s surface directly above an earthquakes starting point
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-the point inside the Earth where an earthquake begins
* When??
  + Seismograms calculate the time an earthquake started and comparing the arrival times of the P waves and the S waves
  + S-P Time method
    - 1. collect several seismograms from the same earthquake at different locations
    - 2. determine the location or distance from each seismograph the earthquake was
  + Earthquake Strength
    - The Richter Scale- commonly used to measure earthquake strength.
      * Named after \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, developed in the 1930’s
      * On the Richter scale, each time the magnitude increases by one unit, the energy of the earthquake increases by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ times

|  |  |
| --- | --- |
| **Modified Richter Scale** |  |
| **Magnitude** | **Effects** |
| 2.0 | Detected only by seismograph |
| 3.0 | Can be felt at epicenter |
| 4.0 | Felt by most in the area |
| 5.0 | Causes damage at epicenter |
| 6.0 | Causes widespread damage |
| 7.0 | Causes great, widespread damage |

* + - Example: if an earthquake is a 6 on the Richter scale, it would release 63.4 times more energy than a 4 on the Richter scale
    - Before the Richter Scale
    - We had the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to classify earthquakes (developed in 1902)
      * Based on observations of people who \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the quake
* 8-3 Society
  + Earthquake hazard-measures how prone an area is to experiencing earthquakes in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Determined by present earthquake activity and previous earthquake activity
  + Forecasting
    - Predicting when and where an earthquake will occur
      * By closely monitoring active faults
    - Earthquake frequency can be related to how often they occur
* Gap Hypothesis
  + States that the sections of active faults that have had few earthquakes are likely to be the sites of strong earthquakes in the future.
    - This is because the area that had relatively few earthquakes have had \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Preparing for an earthquake
  + Earthquake resistant buildings:
    - Mass damper
    - Cross bracing
    - Flexible pipes
    - Active tendon system
    - Base isolators
* 8-4 earthquakes everywhere?
  + The moon-
    - Experiences moon quakes
      * Can last \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than those on earth
  + Mars
    - Mainly active due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but Marsquakes do occur
  + Sun
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-generally much stronger than earthquakes
* Volcanoes
  + A volcano is a mountain that forms when molten rock, called \_\_\_\_\_\_\_\_\_\_\_\_, is forced to the earth’s crust
    - Magma or Lava
      * Magma-occurs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the earth
      * Lava- magma that flows out onto the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Nonexplosive eruptions
  + Lava Flows- come from non explosive eruptions
    - Relatively calm outpouring of lava
    - Usually releases a tremendous amount of molten rock
    - What kind of rocks would these form?????
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
        + What does this non explosive eruption mean to the world?

Although explosive eruptions are more attention-getting, non explosive accounts for more significant role in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Much of the ocean floor is covered with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Formed many of the Pacific Islands (island arc)

* Explosive Eruptions
  + In this kind of eruption, clouds of hot debris and toxic gases shoot out from the volcano
    - The pieces that are blown into the air harden and form dust sized particles that can be in the atmosphere for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Example
  + Mt Saint Helen
    - Erupted in 1980
    - Washington
    - Blasted away most of the one side of the mountain
    - Flattened and scorched 600 km^2
* Volcano Makeup
  + What are the basic features of a volcano?
    - MAGMA in a chamber
    - Vents
    - Lava, which is the outpouring of the magma
* MAGMA
  + Magma is made of a variety of substances and has differing compositions, which is the determinant factor in whether a volcano is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Composition
  + Water:
    - If a volcano has a high water content, it is more likely to explode (if the silica content is also high)
    - This occurs because of the high gas buildup =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Silica:
    - Silica rich magma has a thick, stiff consistency and flows slowly and tends to harden in the volcano vents
    - This leads to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eruptions
* Pyroclastic Material
  + Pyroclastic material is the rock fragments created by explosive volcanic eruptions
* Lava ranges in consistency from thick to thin
  + Thick lava
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-is so thick that it barely creeps
  + Thinner lava
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- looks like wax
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- jagged lava
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- forms underwater
* Pyroclastic Material
  + This material is produced when magma explodes form a volcano and solidifies in the air
  + Comes as big as boulders or as small as dust
  + Types:
    - Blocks-largest pieces, solid rock
    - Bombs- blobs that harden in the air
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- little stones, pebble like
    - Ash- when gases in stiff magma expand and explode into glasslike slivers
* Volcanic Effects
  + The effects on the land can be great, after a volcanic eruption
    - Pyroclastic material can be very detrimental to streams and bodies of water
    - Escaping gases can affect global climate patterns
    - Ash is also very detrimental
      * Ash is ejected during an explosion and can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sun for long periods of time
* Fallout
  + Cloud of hot ash can move rapidly and sometimes take the shape of an avalanche, which chokes and sears the landscape
  + Ash can also mix with water causing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ like mixture that also flows
    - This causes livestock loss, crop shortage, food shortage
      * Though the ash can be useful as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_after the initial devastation
* Climatic change
  + With large scale eruptions, the ash and dust can block out the sun by reaching the upper atmosphere
    - They can travel globally and block out enough sun to change the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Mt Pinatubo erupted in 1991 and the average temp change globally was a drop of \_\_\_\_\_\_\_\_\_\_ degrees C
        + Disrupting the climate globally
        + Causing lower average temps=wetter, cooler summers and colder longer winters!
* The moon
  + What are the dark patches on our moon?
    - Early on, astronomers believed they were \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Now we know they are basins filled with solidified lava that erupted after the moon’s formation
* Volcano Types
  + Volcanoes result from the buildup of rock around the vent
  + There are three basic types of volcanoes:
    - Shield
    - Cinder cone
    - Composite
* Shield volcanoes
  + Are built from layers of lava from repeated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eruptions
  + Lava is runny, so it spreads over a wide area
  + Volcano has gently \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Can be enormous in size
  + Mauna Kea (Hawaii) is the largest mountain on earth (when measured from the sea floor)
* Cinder Cone
  + Small volcanoes made from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eruptions
  + Steep slopes and narrow base
  + Paricutin, Mexico (site of formed very quickly)
  + Erupt for a short time and occur in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Erode quickly
* Composite
  + Sometime called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Most common type
  + Form from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which then are followed by quieter eruptions
  + Mt. Fuji, Japan
  + Broad base and steep sides

DRAWINGS:

|  |  |  |
| --- | --- | --- |
| Shield | Cinder Cone | Composite |
|  |  |  |

* Craters and Calderas
  + Crater-at top of central vent is a funnel shaped pit
  + Caldera-forms when magma chamber that supplies material to a volcano empties and the roof collapses
* Lava Plateau
  + Fissures- long cracks in the crust
  + This forms a lava plateau
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plateau formed 15 million years ago (Oregon)
* 9-3 Causes
* Formation of Magma
  + How does magma form?
    - Forms in the lower crust and upper mantle
    - Made of intensely hot and pliable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Pressure and temperature
    - Rock in the mantle is considered a solid
      * Temp in the mantle will melt any rock
    - Pressure in the mantle keeps rocks tightly packed, which prevents its change to a liquid state
    - A decrease in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is what causes the magma to form!!!!!
* Density
  + When magma is formed, it rises toward the surface of the earth because it is less dense than the rock surrounding it
  + Magma is a mix of liquid and solid mineral material and is less dense than solid rock, so it rises
  + Where do they form?
    - Active volcanoes are around \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Plate boundary of the pacific ocean has so many volcanoes it is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_