These are PREFIXES with the meaning beside each one so it can help you on the CRCT.

Geo-earth, Bio-life, Hydro-water, Pyro-fire, Micro-small, Mega-large, Magneto-magnetic, Astro-space, Electro-electricity, Lith-rock, Therm-temperature/heat, Cryo-cold, Nimbo-rain, Photo-light, Meta-change, Solar-sun, Lunar-moon, Baro-weight Super/Ultra/Hyper-more than, Sub-below/under, Intrusive-inside, Extrusive-outside, Bi/Di-two(2), Poly/Multi-many, Tri-three(3), Un/In/Non/Mis-not, Mono/Uni-One(1), Quad-four(4), Penta-five(5), Octo-eight(8), Omni-all, Re-again, Iso-equal, Homo-same, Hetero-different, Paleo/Archeo-ancient (old), Seismo-earthquake, Volcan/Vulcan-volcano, Meso-middle, Neo-new, Chromo-time, Strato-layers, Sphere-ball shaped, Pro-forward/ positive, Infra-being or belonging to, Pre-before, Trans-across/beyond/travel, Audio-to hear, Hypo-less than, Tele-distance/travel
Something is **organic when** it contains carbon and is found in living things. Something that is **inorganic** means that it does not contain carbon and is a nonliving thing, like certain rocks and all minerals.

The following information will help you on the CRCT:

SPACE/ASTRONOMY

1. ONE YEAR = 1 revolution of the Earth around the Sun is 365 days.
2. ONE DAY = 1 rotation of the Earth on its axis (it takes 23 hours 56 minutes). This is rounded to 24 Hours.
3. During the spring and fall **equinoxes**, around March 21 and September 21(when the Sun is directly overhead at the equator), there is an equal amount of daylight and darkness. **Solstices**, which occur around June 21 and December 21, are the longest and shortest days of the year.
4. Objects appear to have moved in the sky at night because the Earth is rotating on its axis and revolving around the Sun.
5. For a **Solar Eclipse** to occur (happens during the day with the Sun being darkened), the Moon has to be positioned between the Sun and the Earth. For a **Lunar Eclipse** to occur the Earth has to be positioned between the Sun and the Moon (the Moon will be darkened). **Shadows** from the Earth and the Moon cause **eclipses**.
6. Mars, the last of the inner planets, has a rust colored surface, polar ice caps, large volcanoes, and channels that allowed water to flow on its surface at one time. Remember also, the **inner planets** (Mercury, Venus, Earth, and Mars are mostly solid). They are denser than the outer planets. The outer planets (Jupiter, Saturn, Uranus, and Neptune) are mostly gasses. Pluto, the dwarf planet, is mostly frozen and rocky. Remember some scientists today do not classify Pluto as a "real" planet because of its characteristics.
7. It takes approximately 28 days for the Moon to revolve around the Earth. During this time the Moon will go through all of the phases.
8. The **Big Bang Theory** of how the **Universe** was **created** states that the Universe began as a point of energy and matter that exploded which allowed everything in the Universe to form.
9. The **seasons** (winter, spring, summer and fall) occur because of the **tilt of the Earth's axis**. It is tilted at 23 ½ degrees. If the axis were completely vertical with no tilt (90 degrees), all of the seasons would be the same.
10. We have **day and night** on the Earth because it **rotates on its axis**. **One rotation is about 24 hours**.
11. Objects "**float**" in space because Earth's **gravity** affects objects less and less the farther the object is from the Earth. Also, gravity holds all of the objects in the Solar System in place.

12. The **Moon** appears to change shape because it revolves around the Earth. The **Moon's actual shadow** causes the phases of the Moon. The Moon can be **waxing (gaining lighted area),** or **waining (losing lighted area)** during the month. It can also be shaped as a **crescent (curved inward shaped, with dark area moving inward toward lighted area),** or **gibbous (curved outward, with dark area moving toward lighted area). *** see diagram**
13. Two things that affect the appearance of a shadow are **the position of the light source and the position of the object itself.**
14. The **Asteroid Belt** is located between Mars and Jupiter. It separates the inner planets (Mercury, Venus, Earth, and Mars) from the outer planets (Jupiter, Saturn, Uranus, Neptune, and Pluto).
15. The three types of **galaxies** are **irregular** (no definite shape), **elliptical** (oval shaped), and **spiral** (Frisbee shaped). Our galaxy, the Milky Way, is spiral shaped. Our Solar System (the Sun, asteroid belt, planets) is located near the outside edge of the Milky Way, far from the center.
16. A **comet** is a chunk of rock and ice, "**a dirty snowball,"**which orbits the Sun like a planet. Its **tail (always point away from the sun)** is made when the heat from the sun melts the ice and is released into space. Sometimes, the Earth can move into the debris and particles left by a comet. When this happens, these particles can come into the Earth's atmosphere and produce meteor showers called "shooting stars." Comets come from the **Kuiper Belt** and or **Oort Cloud** located beyond our Solar System.
17. A **meteor** (the light produced by the burning of a **meteoroid <rock in space>** as it enters the Earth's atmosphere) happens because of the friction of the Earth's atmosphere making the meteoroid burn up. Sometime meteoroids strike the Earth's surface. At that time they are known as a **meteorite**. They can be seen and collected. **Antarctica** is a very good place to find them.
18. When the **Earth, Moon, and Sun are aligned (in a straight line)** in orbit, very high tides can occur. When this happens the high tides are called **spring tides**. When the Sun, Moon, and Earth form a 90 degree angle, these tides are called **neap tides**. In this situation, the tides will be lower than normal.
19. The **Apollo Space** program was the one that eventually reached the Moon.
20. **The closer an object moves towards a planet or star, the greater the effect that planet's or star's gravity will have on that object.**
21. The **magnitude** of a star has to do with the star's brightness. **Apparent Magnitude** is how the star appears from Earth. **Absolute Magnitude** is how bright the star actually is. The temperature of the star and how far away it is from the Earth can effect how bright it appears. Our Sun is a medium sized star. It is also located in the **Main Sequence** of stars on the **H-R Diagram (Hertzsprung-Russell) diagram. Stars that have warmer looking colors like red and orange are actually cooler than those that are white and blue (hottest stars).**
22. A **light year** is the distance light can travel in one year. It is used to measure extreme distances in space.
23. **Novas and Supernovas** are exploding stars in space.
24. **Quasars** are star-like objects, however, they are brighter than stars and considered to be the most luminous (giving off its own light) objects in the Universe.
25. **Pulsars** are stars that pulsate, when this happens the star appears to be dimming and becoming brighter as it pulsates.
26. The **electromagnetic spectrum is the arrangement of electromagnetic waves. For example, radio waves, x-rays, microwaves, etc…**
27. There are two types of telescopes that use visible light: **Reflecting Telescopes** (uses lenses and mirrors to view distant objects), **Refracting Telescopes** (uses lenses to view distant objects).

28. **Radio telescopes, X-ray telescopes, Infrared telescopes, and Gamma ray Telescopes** use invisible waves from the electromagnetic spectrum to make images on computer screens of distant objects.
29. A **satellite** is any natural or manmade object that revolves or orbits around another object (**Moons and Manmade Weather/Communication satellites**).
30. An **asteroid** is a large meteoroid in space. Most **asteroids** are located in the **Asteroid Belt.**
31. The **Moon** has no atmosphere and is in a **vacuum (no atoms or molecules are present)** therefore **erosion and weathering** cannot take place on the Moon.
32. The outer planets (Jupiter, Saturn, Uranus, and Neptune) all have rings. **Saturn has the most rings, while Jupiter has the most moons.**
33. **The Earth is the only planet in the Solar System that can support life. It has sufficient water and oxygen and a climate that can support life.**
34. **Constellations**, patterns of stars in the sky, can provide a map to locate objects in space.
35. An "**AU" Astronomical Unit**, is used sometimes to refer to distances in space. One AU is about 93,000,000 miles, or the distance from the Sun to the Earth.
36. The closer a planet is to the Sun, the shorter the year it will have because its orbit around the Sun is shorter.
37. The **larger an object is in space** the more **gravitational pull** it will have. The Moon has a gravitational pull about 1/6 that of the Earth. **If you weighed 100 pounds on the Earth, you would weigh about 18 pounds on the Moon.**
38. **As of now, there is no other life in the Universe besides the life on Earth**.
39. A **Black Hole** is a collapsed star whose gravity has grown so great that even **light cannot escape its atmosphere.**
40. A **Space Probe** is launched into space to travel to distant areas in space while sending back information by electromagnetic waves. A **Space Shuttle** takes off like a rocket but flies and lands like an airplane (astronauts can stay in space for days or weeks at a time orbiting Earth). A **Space Station** can allow astronauts to stay and orbit Earth for months at a time. This will allow scientist to conduct extensive experiments and practice living in space for long periods of time.
41. The **Geocentric Theory** said that the Earth was the center of the solar system. The **Heliocentric Theory** said that the Sun was the center of the solar system, which is what we know to be true today.
42. Our **Solar System (the Sun, planets, and everything else that orbits the Sun)** is located toward the outskirts of our **Galaxy, "The Milky Way,"** Our Solar System, the Milky Way, and all of the other matter (stars, **nebulas**-dust & gas in space, asteroids, comets, etc…) make up the **Universe.**
43. **Stars** can be grouped together in formations called **globular clusters or open clusters.** Millions of stars can be grouped in these formations.
44. The **Photosphere** of our sun is the part we can see from Earth.
45. It takes about **8 minutes** for the light from the sun to reach the Earth (186,000 miles per second).
46. The objects we see at night show us the past because we are viewing the light that left the objects or reflected off the object. It may take millions of years for this light to reach the Earth.
47. Stars make their energy by **Nuclear Fusion (the joining of hydrogen atoms together to make helium atoms).** This process creates much more energy than **Nuclear Fission (the splitting of atoms from elements like Uranium, which is used on the Earth to make energy to produce electricity at nuclear power plants).**
48. Scientists say that the **Universe is still expanding today.**

49. Something that is **luminous** means that it gives off its own light (like the Sun or other stars). Something that is **illuminated** means that it reflects the light from other objects (like our Moon and the planets of our Solar System reflecting the light from the Sun).

GEOLOGY

1. A **valley** has been more deeply eroded than two other valleys in the near vicinity. The rock underneath the valley is made of **metamorphic rock** (rock that is created by changing other rocks by heat and pressure inside the Earth). In this valley, the pressure inside the Earth actually caused the valley to be deeper than the other two because the sides of the valley were folded upward making the valley steeper and deeper. This valley is deeper because the metamorphic rock has been **folded by pressure.**
2. The **mineral mica** breaks with cleavage (breaking along smooth flat surfaces) because the atoms have **a regular arrangement** which allows this to happen. The mica will therefore break in similar patters without fracturing (breaking along rough or jagged edges).
3. The Hawaiian Island chain was created by magma rising through the crust of the Earth in the same area for a very long time. This is called a **hot spot.** Over time as the Pacific Plate moved **Northwest,** because of **Plate Tectonics,** the chain of islands were created. Each island was formed by the magma coming from underneath the crust of the Earth and forming new land.
4. **Coal (a nonrenewable resource)** is/was formed from dead plants that lived millions of years ago. When the plants died they formed sediments (**called Peat)** that eventually formed the **coal** that we use today as a fuel source. The three types of coal are **Anthracite, Bituminous, and Lignite.** Anthracite is the best for burning because it burn hot and clean which is good for electrical power plants. Pressure caused compaction that allowed for the coal to form. Coal is a nonrenewable fuel source because once it is used it can no longer be created. Other nonrenewable resources would be natural gas, oil, and uranium (nuclear energy). **Renewable resources (resources that can be used over and over again and will not run out) would be sunlight, falling water (hydroelectricity), geothermal energy (heat from the Earth), Biomass (living things like trees) and wind.**
5. **Erosion** can cause mountains to be worn away over millions of years. However, at times forces inside the Earth can be greater than erosion and cause land to be **uplifted** to form hills and mountains. Remember it takes a very long time for this to occur.
6. The greatest influence that would cause the most weathering and erosion on the surface Earth's surface would be the **regional climate** (the average of all weather conditions in an area over an extended period of time). Also, **water** is the erosion agent that causes the most weathering and erosion to occur.
7. **Faulting** (breaking and cracking of the Earth's crust) can occur both on the surface of the Earth as well as below the surface. When this happens, not only can cracks be created, but hills and mountains can be formed as well. The **San Andreas** fault in California is the United States most famous fault. It forms along a **Transform boundary in which the North American and Pacific plates are sliding past each other.**
8. **Mountains (upwarped, folded, fault block, volcanic)** have high elevations and steep slopes. **Plains** have low elevations and gentle slopes. **Plateaus** have medium elevations with steep to gentle slopes.
9. **Halite** (also known as salt-chemical formula-NaCl), breaks with **cleavage** and at **90 degree right angles** to each other. When the halite breaks, the shapes will look like **cubes.**

10. **Limestone** (which has a great deal of the element calcium in it-the calcium actually forms the mineral **Calcite which forms the Limestone**) would be a very good example of a rock that can be worn down by chemicals in the environment (**chemical weathering**). Therefore, many limestone caves have been created because of this fact. **Mechanical weathering** would be caused by physical processes like moving water, wind, and glaciers.
11. A fact about **Glaciers (which are made of Ice)** is that **U-Shaped** valleys can be created in mountain areas when these **Glacier**s move along. **Glaciers** can be classified as **Alpine (found in mountains) or Continental (ice covering large areas of land, for example Greenland and Antarctica). Fjords, sea inlets,** many of which are located on the Scandinavian Peninsular, were carved by glaciers. **Crevasses** are cracks in a glacier, while **till and moraine** are debris that are pick up and carried by the glacier
12. The **Moh's Mineral** scale is numbered 1-10. Calcite has a hardness number of 3, quartz has a hardness number of 7. Diamond has a hardness number of 10. Glass has a hardness number of 5.5. The quartz could cut the glass but the calcite could not because the quartz is harder than the glass, and the calcite is softer than the glass.
13. The reason that minerals' hardness differ is because of the minerals' **crystal structure**. Some minerals are harder than others because of this reason.
14. **Compaction (sediments being pushed together)** can cause sedimentary rocks to form. For example, sediments such as gravel, soil, sand or other materials can be found in sedimentary rock.
15. **Igneous rocks** can form inside (intrusive) or outside (extrusive) the Earth's surface. They are **"fire formed"** and are made from magma (melted rock inside the Earth) and lava (magma on the surface of the Earth). **Granite**, a very hard igneous rock is an igneous rock. Stone Mountain is actually a giant piece of granite that formed underground. Over time the softer material surround the area wore away and left the **Pluton** (giant area formed by cooling magma underground) exposed.
16. The **Rock Cycle** is the process of rocks changing from one form to another. The three main types of rocks are **igneous, sedimentary,** (made from sediments), and **metamorphic** (rock that has changed from an Igneous, Sedimentary rock).
17. The three types of volcanoes are **Shield (gently sloping side-layers of lava build up creating it), Cinder Cone (steep sided-made of tephra, loosely packed materials like ash and dust), and Composite (looks like a regular mountain with layers of tephra and lava building it up).**
18. The **three** types of earthquake waves are **Primary Waves** (P-waves-the fastest waves), **Secondary Waves** (S-waves), and **Surface Waves**. Primary and Secondary waves occur in the Earth. Surface waves move on the surface of the Earth and cause the most damage. The **Richter Scale** measures the strength of an earthquake. A **seismograph** is the instrument that picks up seismic (earthquake) waves. A **seismologist** is a scientist that studies earthquakes.
19. Minerals are made from various elements. Rocks are made from two or more minerals. Minerals and rocks have various characteristics (**hardness, color, streak, fracture, cleavage and luster**-(how shiny it is), etc…). **Specific gravity** is also a characteristic of a mineral-it is the ration of the weight of the mineral compared with an equal volume of water
20. The Earth has a solid inner core, a liquid outer core, a semi-solid mantle (**aesthenosphere**-it is plastic like, **lithosphere**-more solid and rock like) and a relatively solid crust. The lithosphere (**made of oceanic and continental crust**) floats on the aesthenosphere. The cores of the Earth are made mainly of the elements: **iron, cobalt, and nickel**.
21. **Silicon** is the most abundant element in the Earth's crust. **Silicon Dioxide (SiO2)**, known as **sand,** is the most abundant compound in the Earth's crust. **Aluminum** is the most abundant metal in the Earth's crust.

22. An **ore** is a rock that contains a metal that can be extracted (taken out) and used
23. to help humanity. For example, Aluminum and Titanium can be used to better
24. society.
25. 23. **Foliated rocks** are rocks that form in layers. **Nonfoliated rock** does not form in layers.
26. 24. **Continental drift** is the scientific process used by scientists to explain how one large landmass millions of years ago (**Pangaea**) became the seven continents we have today.
27. 25. **Cementation** of rocks occur when particles of rock gets "glued" or cemented together. This can happen in sedimentary rocks.
28. 26. **Deposition** means depositing sediments in an area and layers can build up over time.
29. 27. **Fossil fuels** (coal, oil-known as petroleum, and natural gas) are **nonrenewable resources**. This means that once they are used up they are gone forever. **Renewable resources** can be used over and over again.
30. 28. A **topographic map** is a map that shows changes in elevation. Topographic maps can be in 3-D or made with contour lines making a **contour/topographic** map.
31. There are three **Horizons** in a soil profile. They are known as **Horizons A, B, and C**. Horizons are layers that run left to right or in a horizontal manner. Ex.---------
32. **Stalactites** (cone feature hanging from the top of a cave) and **Stalagmites** (cone feature building up from the bottom of a cave) are cone like features that form in caves (especially limestone caves).
33. **Paleontology** is the study of the past like fossils and dinosaurs. A **paleontologist** is a scientist that studies the past.
34. **Uniformitarianism** is the belief that the Geologic processes of the past are happening just like they are today (like erosion) forming the features of the Earth's surface. **Catastrophism** is the idea that geologic change occurs suddenly (like an earthquake, volcanic eruption, or an asteroid hitting Earth).
35. **Superposition** states that younger rock layers lie above older rock layers. If rock layers have been folded, tilted, or changed drastically, this is said to be an **unconformity.**
36. **Rock layers (called strata)** can be stretched (tension), folded, uplifted, subducted (pushed down or under other rock layers), compressed (pushed together), etc…The Earth is constantly changing.
37. Direct evidence for the movement of the Earth's tectonic plates (**Plate Tectonics)** would be **Earthquake and Volcanoes.** Indirect evidence of the movements of the Earth's plates would be a fossil of an ocean fish found on top of a high mountain that is no longer covered by ocean water.
38. The two types of Earth's crust would be **Oceanic (the ocean floor) and Continental (the continents and lands masses located above the ocean).**
39. **Sea Floor Spreading** occurs at the Mid-Ocean Ridges. Younger rock is found at the middle of the oceans near the Mid-Ocean Ridges, while older rock is found towards the continents.
40. **Seismology** is the study of earthquakes, while a **seismograph** measures earthquake waves.
41. **Convergent** plate boundaries occur where tectonic plates are moving together. **Divergent** plate boundaries occur where tectonic plates are moving apart. **Transform** plate boundaries are where tectonic plates are sliding side by side; here many earthquakes can occur (like at the San Andreas fault in California). **Plate Tectonics** is the theory that the crustal plates of the Earth have moved and are still moving today.
42. Geologic history can be divided into the following categories: **Eons-the longest time category, Eras-the second longest time category, Periods-the third longest time category, and Epochs-the fourth longest time category.**

43. An **anticline** formation in which rock layers have been folded upward and make am A-shaped structure. A **syncline** is the opposite in which rock layers have been folded downward into a U – shaped formation

HYDROLOGY AND METEOROLOGY

1. **Convection** occurs when air is heated by sunlight. The air expands, rises, and can eventually turn into a cloud.
2. **Clouds** form when dense, cold air pushes warm air upward. The air cools and condenses to form the clouds.
3. **The Gulf Stream** is a warm ocean current that can affect the climate of the Northeastern part of the United States.
4. **Hail** is produced when wind (updrafts) lifts water droplets high into a thunderstorm cloud (cumulonimbus). The droplets freeze and continue to grow larger until the force of gravity overcomes the strength of the wind pushing the ice pellets upward. The larger the **hailstone** the stronger the storm.
5. There is less **water vapor (humidity)** in desert air. Therefore, it is not likely that this area will experience early morning fog.
6. **Bodies of water, such as oceans, rivers, and lakes** change temperature slowly because liquids heat and cool more slowly than other types of matter. Therefore, the middle of a continent would have more extreme temperature differences than those land areas located near oceans. The oceans would regulate (have an influence on) the land areas located near them.
7. Today weather forecasts are more accurate than in the past due to the use of satellites and the **images they take of the Earth from space**.
8. Fronts on weather maps show **boundaries between air masses.** For example, a cold front separates colder air from warmer air and a warm front separates warmer air from cooler or colder air. The front is named for the air mass that is moving or advancing into another air mass.
9. Land, which is a solid, absorbs radiation from the Sun faster than water. Therefore, it heats up more quickly than water.
10. Global winds are produced by **high pressure polar air and low pressure equatorial air.**
11. Snowfall occurs when temperatures are 32 degrees or below and clouds precipitate (meaning that moisture is released from the clouds).
12. Interior (inside areas) of continents have **more extreme differences between winter and summer** because these areas are away from the effects of the ocean.
13. Solar radiation (waves of energy from the Sun), produce **heat on Earth** because the radiation warms the air. The radiation causes the atoms and molecules in the air to vibrate more quickly.
14. The radiation from the Sun can effect both weather (what is happening in the atmosphere at any given time), and climate (the average of all weather conditions in a given area over a period of time). The Sun's heating of the Earth is the biggest factor concerning weather and climate
15. Global winds curve because the Earth **rotates on its axis.**
16. **Tides are <u>not</u> a factor** when studying weather and climate. Tides have more to do with the Sun and Moon's gravitational pull on the Earth causing the rise and fall of the ocean.

17. Meteorite collisions, deforestation (cutting down Earth's trees), and changing ocean currents all can effect Earth's climate change, however, **Earthquakes** do not influence the climate because they impact only the Earth's interior and surface, not the atmosphere.
18. Sea and land breezes form because **the land heats and cools more quickly than the water.**
19. When air is warmed by sunlight, the air **expands and rises resulting in convection. Convection is the process in which gasses and liquids are heated.**
20. A **hygrometer** or **psychrometer** measures the amount of **humidity** in the air, a **rain gauge** measures how much rain has fallen, an **anemometer** measures the speed of wind, and a thermometer measures temperature. If you measured the humidity of a cold, dry, climate, you would use a **hygrometer/psychrometer** because it measures humidity and it would indicate a low reading because this environment would be dry. Other instruments that measure weather phenomena would be an anemometer (wind speed), rain gauge (how much rain has fallen) and a barometer (air pressure).
21. If you walked along the ocean bottom from a beach, you would first reach the **continental shelf.** Secondly, you would reach the **continental shelf.** The **abyssal plain** is the oceans' basin or the true ocean floor, you would reach this lastly.
22. **Humidity** is water vapor in the air and can cause a person to feel damp on a hot summer day. The higher the **Dew Point temperature**, the higher the humidity. The lower the Dew Point temperature, the lower the humidity will be. **The Dew Point temperature is the actual temperature of the air it has to be in order for condensation (changing from a gas to a liquid) to take place.**
23. **Sea and land breezes** occur at the ocean because land heats and cools more quickly than the water. The oceans cool and heat up more slowly than the land because this is a characteristic of matter. A **sea breeze occurs during the day** while a **land breeze occurs at night**. Air rises on land during the day as the air from the ocean rushes in to fill the area that has risen. At night, the air over ocean rises because now the ocean is warmer than the land. The air over the land rushes in to fill where the air over the ocean has risen. Sea breezes happen during the day, while land breezes happen at night.
24. If **groundwater** is used up more quickly than it is replaced **wells can go dry**.
25. The sky over deserts is not cloudy because there is **not enough moisture or humidity in the air for clouds to form.**
26. An **aquifer is a very large area underground that can supply water to thousands of people.**
27. Volcanoes are part of the water cycle because they do release **water vapor into the atmosphere.**
28. **Wind and temperature variations can cause ocean currents.** Ocean currents can be cold or warm. The **Gulf Stream** is an example of a warm ocean current located of the east coast of the United States. The California Current is an example of a cold current located off the west coast of the United States.
29. **Most of the Earth's water is located in oceans.** The Earth is 70% water and 30% land. The oceans make up 97% of the Earth's water. Three percent is fresh water of which most is in **glacier and polar ice caps. Drinkable water makes up only .03% of the freshwater because most of it is in glaciers and polar ice caps.**
30. Mineral can get into streams and rivers because rainwater can dissolve the minerals out of the rocks and soils during the runoff when it is raining.
31. **Seafloor spreading creates new ocean floor because magma comes to the surface and makes new seafloor. Volcanoes and ridges can also be formed as the ocean floor (plates) spreads apart.**

32. Remember **Plate Tectonics (volcanoes erupting and earthquakes are direct evidence for Plate Tectonics)** is the explanation that scientists give for how the Earth's upper layers move. There are three types of plate boundaries **Convergent, Divergent, and Transform. Convergent boundaries occur when two plate are coming together or colliding (mountains can be formed like the Himalayas). Divergent boundaries occur when two plates are moving apart (like at the Mid-Ocean Ridges). Transform boundaries occur when two plate slide past each other. Magma coming to the surface can form new rock. Sometimes one plate can move under another. This is called <u>subduction.</u>** Volcanoes can happen when this takes place. The **"Ring of Fire,"** located around the Pacific Ocean is the most active place on Earth for volcanoes and Earthquakes.
33. The **Gulf Stream**, a warm ocean current that starts in the tropics and moves up the East Coast of the United States, can affect the climate in the Northeastern part of the United States because it located off the coast in that area. Massachusetts and other states in this area are affected by this current. Temperatures and climate can be slightly warmer.
34. **Hurricanes** weaken as they move over cooler water because they lose their fuel source (warm ocean water). Usually hurricanes begin in the tropics and move across the ocean. They will eventually weaken and die because they move into cooler water or they will move onto land causing damage and possibly deaths. Hurricanes begin as a Tropical Disturbance, then make a **Tropical Depression**, then a **Tropical Storm** (the storm gets a name), and finally a hurricane is made. Hurricanes can be classified 1-5 on the **Saffir-Simpson Scale**. The higher the number the stronger the storm. Also, **tornadoes** can be classified on a scale as well (the **Fujita Scale**). They are classified as F-0 through F-5. They also increase in strength as the numbers increase
35. In order for the **water cycle** to continue to happen, water vapor must condense into liquid water. Clouds form and rain occurs. **Evaporation** (changing from a liquid to a gas) happens first, **condensation** (changing from a gas to a liquid) happens second, and **precipitation** (rain, snow, sleet, hail, and freezing rain) happens third in the process of the water cycle. **<u>Convection (the movement of heat in gases and liquids) is also very important in this process. If convection did not happen clouds could not form because the air would not be rising producing clouds.</u>**
36. If a city is located near the ocean, the winters will be warmer and the summers will be cooler because the **<u>ocean warms the city during the winter and cools the city during the summer because water warms and cools more slowly than air and land. This fact is a characteristic of matter. Liquids heat and cool more slowly than solids and gasses.</u>**
37. The three main types of clouds **are Cirrus** (high clouds made of ice crystals), **Cumulus** (middle height clouds made of water vapor, these are fair weather clouds, seen in the summer time), and **Stratus** (low level clouds that look like a dull gray blanket). **Cumulonimbus** clouds are thunderstorm clouds that can produce hail, lightning, and tornadoes. **Nimbostratus** clouds are "true" rain clouds that produce drizzle or steady rain but really no severe weather. **Nimbo** is a Latin word for rain.
38. The **troposphere** is the lowest layer of the Earth's atmosphere in which 99% of all weather occurs. It goes up to about seven miles high. The **stratosphere** is above the troposphere and contains the **ozone layer** that protects us from the Sun's harmful ultraviolet rays.
39. The **hydrosphere** is all of the water on the Earth's surface.
40. The **Greenhouse Effect** happens when **Carbon Dioxide** and Water Vapor trap the Sun's heat in the Earth's atmosphere. Some scientists think that humans are producing too much **Carbon Dioxide** which is causing **<u>global warming.</u>** This process occurs naturally on the planet **Venus** making it the hottest planet in the Solar System.

41. The **Coriolis Effect** (spinning of the Earth on its axis), causes air to move to the **left** in the Southern Hemisphere and to the **right** in the Northern Hemisphere. Low pressure in the Northern Hemisphere rotates counter-clockwise. Low pressure in the Southern Hemisphere rotates clock-wise. This **Effect** also causes tropical systems (hurricanes, tropical storms, typhoons, etc…) to **spin or rotate. Counter-clockwise in the Northern Hemisphere and clock-wise in the Southern Hemisphere.**
42. A **Geologist** studies the Earth's surface features as well as inside of the Earth (**vulcanologist, seismologist, oceanographer, etc**…) a **meteorologist** studies the Earth's weather and atmosphere.
43. **Salinity** (think of salt) is the measure of how much salt is dissolved in ocean water. Salinity can vary from place to place in seas and oceans because of increased freshwater from rivers or rainwater moving into saltwater or evaporation which makes the water saltier.
44. **Longshore Current** is the movement of the ocean that is parallel to the beach or coastline. This process can move tons of sediment.
45. The **Earth's atmosphere** is basically 78% Nitrogen (Symbol is N) and 21% Oxygen (symbol is O). 1% is Argon (symbol is Ar), Carbon Dioxide (formula is CO2), etc…
46. **El Nino, in Spanish meaning "the boy child,"** is the warming of the Pacific Ocean off the coast of South America. This can cause severe changes in weather patterns like flooding along the west coast of North America as well as droughts in Indonesia and Australia. **La Nina, "the girl child" is the cooling** of Pacific Ocean water off the coast of South America, it can also affect the Earth's weather patterns.