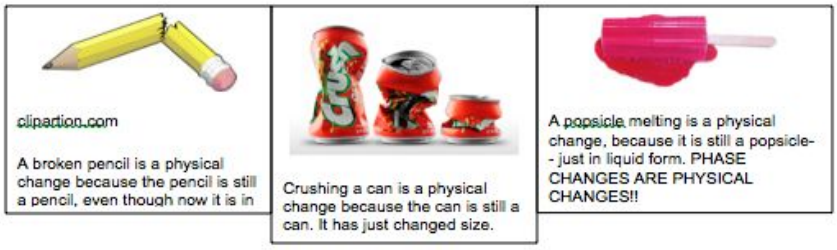
5th Grade Science Study Guide

Matter

The weight of an object is always equal to the sum of its parts, regardless of how it is assembled. In a chemical reaction or physical change matter is neither created nor destroyed. When two or more materials are combined, either a chemical reaction or physical change may occur. Chemical reactions are often indicated when materials give off heat or cool as they take in heat, give off light, give off gas, or change colors. In a chemical reaction, materials are changed into new substances. In a physical change a new substance is not formed.

Physical Changes

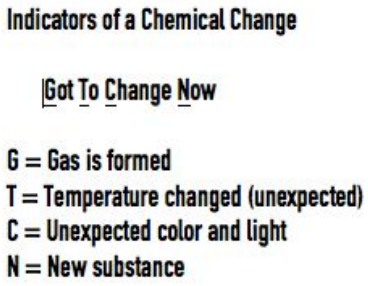


Chemical Changes

Whole = sum of parts

Ball of dough = 10 grams

Cut into 3 parts = 10 grams



Vocabulary

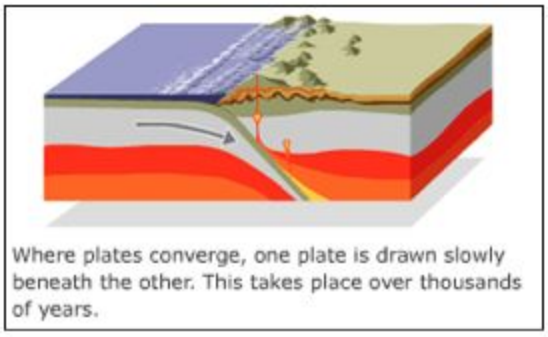
heat: energy being given off or absorbed
substance: the material that something is made of
chemical change: one or more substances are changed to form a new substance
dissolve: the visual appearance of one substance into another when they are mixed
physical change: change in the form of matter but not what it is made of
matter: something that has mass and takes up space
product: something that is made
reactants: the substances mixed together to produce a chemical change
solid: matter that has a definite volume and holds its own shape
liquid: matter that has a definite volume but no definite shape
weight: the pull of gravity on matter
gas: matter that has no definite shape or volume

Great website:
http://chemwiki.ucdavis.edu/Core/Analytical_Chemistry/Qualitative_Analysis/Chemical_Change_vs._Physical_Change

Earth's Surface

The Earth's surface is constantly changing. Some changes happen very slowly over long periods of time, such as weathering, erosion, and uplift. Other changes happen abruptly, such as landslides, volcanic eruptions, and earthquakes. All around us, we see the visible effects of the building up and breaking down of the Earth's surface. Forces of weathering and erosion are always taking place though it usually takes years to notice most changes. Some changes occur rapidly like landslides and flash floods.

Facts to remember:
- Water moves the most rock on Earth's surface.
- It takes thousands of years for glaciers to carve u-shaped valleys like the ones in Northern Utah.
- When a hot rock deep in the Earth expands and is forced out of the opening of a volcano, it may form a mountain.
- A seismograph is a tool used to help predict an earthquake.
- Earthquakes are caused by the movement of the Earth's crust
- Volcanoes, earthquakes, and uplift affect the Earth's surface by creating mountains and valleys.


Where plates converge, one plate is drawn slowly beneath the other. This takes place over thousands of years.

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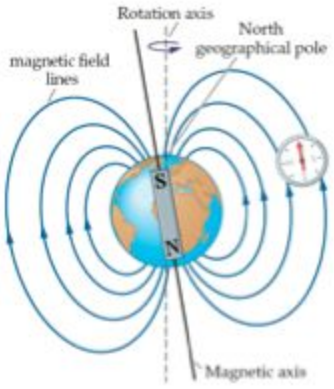
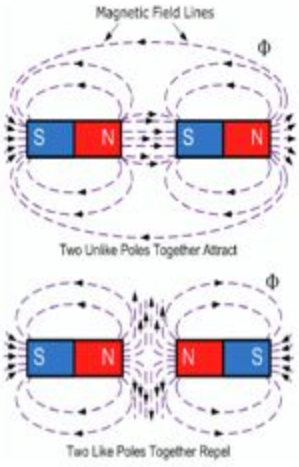
Vocabulary

earthquake: energy waves passing through Earth caused by a sudden shift of Earth's crust along a fault
erode: to wear away by the action of water, wind, or glaciers
erosion: the process of moving weathered bits of rock from one place to another
faults: cracks in the Earth's crust that allow the crust to slip
uplift: part of Earth's surface that rises above the surrounding land by great forces of heat and pressure deep within the Earth
volcano: an opening in Earth's crust that allows hot, melted rock, ash, and gases to erupt outward
weathering: the physical breaking up of the rocks on Earth's surface into smaller pieces of rock or sand
buttes: an isolated hill with steep, even sides, and a flat top
arches: curved rock formations, formed by a combination of erosional forces
glaciers: thick layers of ice
geological: relating to the structure of Earth and the changes that have taken place over the years
deposition: the dropping of sand and rock carried by wind or water as it slows down or from ice that melts

Magnetism

Earth and some earth materials have magnetic properties. Without touching them, a magnet attracts things made of iron and either pushes or pulls on other magnets. Magnets attract iron, nickel, and cobalt. Opposites attract: a north and south pole attract. North and north or south and south repel.





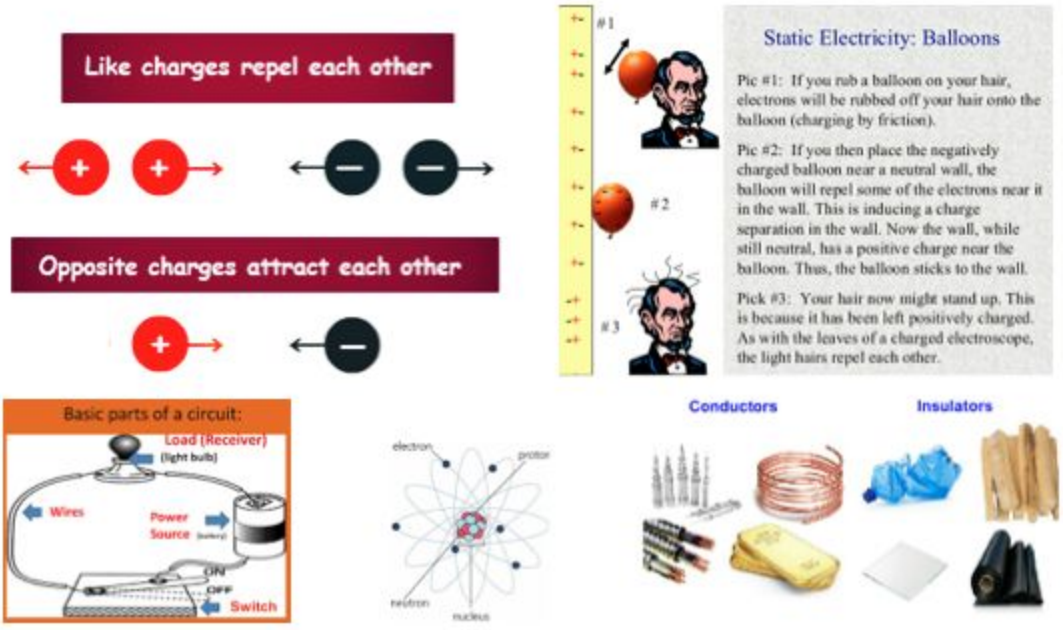
Vocabulary

attract: to draw objects together
compass: an instrument used to determine geographic direction on Earth
electromagnetism: the magnetism produced when an iron core is magnetized by an electric current passing through a wire that is coiled around an iron core
magnetic force: the power of the magnet to push or pull other magnetic material
magnetic field: the area around a magnet where the magnet has power to attract magnetic material
natural magnet: a mineral made magnetic by Earth's magnetic field
permanent magnet: an object that keeps its magnetism after it has been magnetized
repel: to push objects apart
temporary magnet: a magnet that does not keep its magnetism

Electricity

Electricity is a form of energy. Current electricity can be generated and transmitted through pathways. Some materials are capable of carrying electricity more effectively than other materials. Static electricity is a result of objects being electrically charged. Without touching them, materials that are electrically charged may either push or pull other charged materials.

- Rubbing fur on a glass rod produces a greater charge then rubbing the fur with a metal rod, the static charge produced when a balloon is rubbed on hair is greater than when a plastic bag is rubbed on hair.



Vocabulary

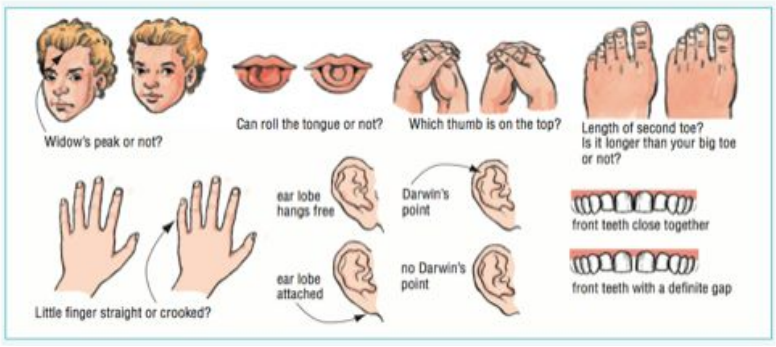
battery: a device that generates electricity by combining certain chemicals
complete circuit: a connected pathway through which electricity can flow; includes a power source, load, and pathway
incomplete circuit: a circuit with a gap through which electricity cannot flow
current: flow of electricity along a path
conductor: material that allows electricity to pass through easily
insulator: material that does not allow electricity to pass through
pathway: a course through which electricity can flow
power source: a device that supplies electricity to a circuit; such as a battery, a solar cell, or a generator
static electricity: the collection of electrical energy or charge in one spot
switch: a device that immediately changes a circuit from complete to incomplete
load: an item that uses electricity to do work; for example, a light bulb or fan
attract: to pull to or draw toward oneself or itself
repel: to force (something) to move away or apart

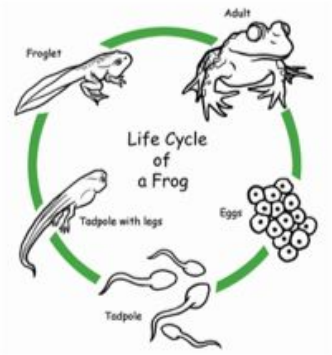
Heredity

All living things inherit a set of characteristics or traits from their parents. Members of any given species transfer traits from one generation to the next. The passing of traits from parent to offspring is called heredity and causes the offspring to resemble the parent. Some traits differ among members of a population, and these variations may help a particular species to survive better in a given environment in getting food, finding shelter, protecting itself, and reproducing. These variations give the individual a survival advantage over other individuals of the same species.

Examples of offspring that do not initially resemble the parent organism but mature to become similar to the parent organism: mealworms and darkling beetles, tadpoles and frogs, seedlings and vegetables, caterpillars and butterflies.

Heavy fur in arctic climates keep animals warm whereas in hot desert climates it would cause overheating; flippers on such animals as sea lions and seals provide excellent swimming structures in the water but become clumsy and awkward on land; cacti retain the right amount of water in arid regions but would develop root rot in a more temperate region; fish gills have the ability to absorb oxygen in water but not on land.





Vocabulary

inherited: a characteristic passed from parents to their young
environment: the surroundings in which an organism lives
species :a certain group of plants or animals that can only reproduce among themselves
offspring: the young of an organism
traits: characteristics that determine how an organism looks, acts, or functions
variations: differences in the appearance of an inherited trait among the members of a group (species)
survival: the continuation of life
instincts: behaviors that are inherited from parent organism
population: the number and kind of organisms in an area
specialized structure: a body part unique to a species for survival in its environment
organism: an living thing that can carry out its life activities on its own
life cycle: the stages a living organism will go through during its lifetime
parent organism: a producer of offspring
learned behavior: an action that is learned through trial and error or is brought about by the environment