**Unit 1  - What is Science?**

HINT: Review your lab safety

**Science** -  "the search for knowledge", the systematic knowledge of the physical or material world gained through observation and experimentation; science is dynamic - in a state of change as new discoveries are made

**quantitative observation** - use numbers or measurements to describe with one or more of your senses; senses may be enhanced with specialized instruments

**qualitative observation** - describe with one or more of your senses using the qualities of something like color; senses may be enhanced with specialized instruments

**inference** - logical process by which new statements are derived from known and observed facts; may or may not be true

**procedure** - steps used in the experiment

**analysis** - using math to make meaning of the data

**controlled variables** - keeping all the other variables the same except the independent variable

**control** - having a treatment in which nothing was done as a comparison for other treatments in an experiment

**conclusion** - a statement about your discoveries in the experiment

**theory** - a well supported explanation in science in which some aspects are still not fully understood

**hypothesis** - an educated guess or prediction that can be tested in science

**scientific method** - the logical process or series of steps by which scientist gather and verify information

**scientific law** - facts or a process well documented and understood in science

**independent variable** - manipulated variable - controlled by the scientist - graphed on the x-axis

**dependent variable** - responding variable - measured by the scientist - graphed on the y-axis

**technology** - using science to make useful things

**SI** - the International System of Units  (metric system)

**kilo** - 1000

**hecto** - 100

**deca** - 10

**deci**  - 0.1

**centi** - .01

**milli** - .001

**Unit 2 Interactions of Matter

Atom -**the smallest unit of an element that maintains the chemical properties of that element; basic builidng bliock of matter
 **Boiling Point -**temperature at which a liquid changes to a gas at a given pressure

**Density -**the measure of mass of a substance per unit volume

**Ductility** - the ablity to be formed or pulled into a wire or tube

**Element -**a substance that cannot be separated or broken down into simpler substances by chemical means; all the same of type atoms

**Compound** -a substance made of two or more different atoms

**Heat -**the energy transferred between objects that are at different temperatures

**Mass -**amount of matter contained in a substance

**Matter -**  anything that has mass and volume

**Melting Point** - the temperature and pressure at which a solid becomes a liquid

**Malleability** - able to be bended, shaped, or flattened or hammered flat

**Motion -**an object's change in position relative to a reference point

**Particles -**a  very small piece or part; a tiny portion or speck.

**Phase -**one of the four states or conditions in which a substance can exist: solid, liquid, gas, or plasma.

**Physical Changes -** a change which occurs without changing the identity of the substance.

**Pure Substance -**a sample of matter, either a single element or a single compound, that has definite chemical and physical properties
 **Saturation -**a solution that cannot dissolve any more solute under the given conditions

**Solubility**- the solubility to dissolve in another substance

**Solute -**in a solution, the substance that dissolves in the solvent

**Solvent -**in a solution, the substance in which the solute dissolves

**Volume -**amount of space an object occupies

**Mass -**a measure of the amount of matter in an object

**Crystal Pattern -**a solid in which all the atoms are arranged in a regular, repeating pattern.

**Evaporation** - process in which liquid water changes to water vapor with the addition of energy.

**Filtering** - a porous material through which a substance is passed in order to separate the fluid from suspended particulate matter.
 **Heterogeneous -**a mixture that is not mixed evenly and each component retains its own properties

**Homogenous** - solid, liquid or gas that contains two or more
  substances blended evenly throughout.
 **Mixtures -**the physical combination of 2 or more substances; can be separated by physical means.
 **Molecule -**the smallest physical unit of a compound that can exist independently, consisting of one or more atoms held together by chemical forces; formed by bonding
 **Sifting -**to separate and retain the coarse parts to remove lumps and large particles

**Conductivity -**property of metal and alloys that allow heat or electricity charges to pass through the material easily.

**Metals -**an element below and to the left of the stair-step line of metalloids; about 80% of the known elements are
  metals; metals are shiny, good conductors, low specific heat, high mealting points, maleable, and ductile.

**Model -**a standard or example used for comparison.
 **Periodic Table -**an arrangement of elements in order of increasing atomic numbers that demonstrates the periodic patterns that occur among the elements.

**Physical Properties -** a characteristic of a substance that can be observed without changing the identity of the substance

**Reactivity -**the ability of an atom or molecule to undergo a chemical reaction with another atom, molecule or compound.

**Chemical bond -**the "glue" that attracts and keeps atoms held together due to sharing of each atom's electrons

**Chemical change -**the process in which one or more substances are changed into one or more new substances

**Chemical property -**property that can be observed only when a substance is changed into a new substance

**Chemical reaction**  - the process in which one or more substances are changed into one or more new substances
 **Precipitate -**the solid that is formed as a result of a precipitation reaction

**Closed System -**the reactants and products in the reaction that are contained to reduce error

**Law of Conservation of Mass -**states that the total amount of mass and energy in the universe is conserved (does not change)
 **Products -**materials present at the end of a reaction

**Reactants -**the starting materials in a reaction

**Unit 3  Cell Processes, Digestion and Disease
Cells**  -Basic unit of life; smallest structural unit of an organism that is capable of functioning independently

**Eukaryotic Cells -**Cells that have a distinct, membrane-bound nucleus

**Fuel -**Something that gives nourishment; food

**Molecule -**The smallest physical unit of an element or compound, consisting of one or more like atoms in an element and two or more different atoms in a compound

**Organelle -**A specialized subunit (cell organ) within a cell that has a specific function and is usually separately enclosed with its own lipid layer

**Prokaryotic Cells** -Cells without a nucleus

**Respiration -**The process in which nutrients are converted into useful energy in a cell

**Thermal Energy -**The movement of atoms and molecules; portion of energy that is responsible for a system's temperature

**Alcohol -**An organic compound that is a volatile, flammable, colorless liquid that can be consumed by humans and in other forms used in thermometers, as a solvent, and as a fuel.

**Dietary Habits -**The decisions an individual makes when choosing what foods to eat

**Digestion**  -Process by which food is broken up physically, by action of teeth, and chemically, by action of enzymes, and converted into a substance suitable for absorption into the body.

**Respiration -**The process in which nutrients are converted into useful energy in a cell; process where organisms take in oxygen and release carbon dioxide

**Tobacco Product** -processed from the leaves of a plant, it can be consumed, used as a drug, pesticide, and in some medicines.

**Toxic Substance-**Any chemical or mixture that may be harmful to the environment and to human health if inhaled, swallowed, or absorbed through the skin

**Antibiotics-**drug that kills bacteria and cures bacterial infections and diseases

**Bacteria -**domain of prokaryotes, some of which cause human diseases. Lacks a nucleus.

**Disease-**An abnormal functioning of the body or part of body, sometimes caused by infections.

**Fungi -**kingdom in the domain***Eukarya*** that includes molds, mushrooms, and yeasts

**Host Cell -**Cell of species that is harmed in a parasitic relationship

**Microbiology -**The study of organisms which are too small to see without a microscope.

**Parasite -**Organism that forms symbiotic relationship in which one species benefits while the other species is harmed

**Prevention -**Methods of reducing the likelihood of contracting a disease. Methods of prevention depend on the organism that causes the disease.

**Treatment -**The response to a disease provided through medical professionals

**Unicellular -**An organism composed of one cell only

**Virus -**A particle that cannot independently reproduce yet contains genetic information and can evolve. Viruses may cause disease in the host cell/organism

**Antimicrobial -**Describing a substance that kills microbes in an effort to prevent the spread of a disease

**Epidemic -**Occurs when the incidence rate of a disease is higher than expected in a certain area

**Microbes -**Microscopic organisms

**Microbiology -**The study of microscopic organisms

**Pandemic -**An epidemic that spreads across a large area, like a continent

**Pathogen -**Disease causing organism; "germ"

**Vector -**Mechanisms or organisms (excluding humans) that spread diseases without showing symptoms

**Biotechnology -**The use of living systems and organisms to develop or make useful products. For thousands of years, humankind has used biotechnology in agriculture, food production and medicine

**UNIT 4 - THE HYDROSPHERE
Adhesion** – the tendency of water to stick to other substances

**Buoyancy** – the ability of a fluid to exert an upward force on an object that is immersed in the fluid

**Capillary Action** – the process that moves water through a narrow porous space

**Cohesion** – the attractive force between water molecules

**Insoluble** – not soluble; will not dissolve

**Polarity** – uneven distribution of charges across a molecule

**Soluble**– having the ability to be dissolved in another substance

**Specific Heat** – the amount of heat needed to raise the temperature of one gram of a substance by one degree
Celsius; low specific heat means a substance will heat up quickly

**Surface Tension** – the force that acts on the particles at the surface of a material

**Universal Solvent** – the quality of water that makes it able to dissolve more substances than any other solvent
can
**Condensation –**the process of warm air cooling as it rises and releasing moisture in the form of a liqui
 **Evaporation –**the process by which a liquid is changed into a vapor from the surface by gaining energy

**Groundwater -**water located below Earth’s surface in aquifers

**Hydrosphere -**the portion of the Earth that contains water; all the water on the earth

**Impermeable -**does not allow water to move through

**Infiltration -**water that seeps into rocks and between particles of soil; see percolation

**Percolation -**the downward movement of water through pores and other spaces in soil due to gravity

**Permeable -**having pores or openings that allow water(or other liquids) to flow through them

**Precipitation -**the rain, snow, sleet or hail that falls from clouds onto the Earth’s land and oceans

**Runoff -** is precipitation that flows over land into streams and rivers.  This water later enters oceans.

**Surface Water  -**water found on the surface of the Earth

**Transpiration -**water vapor given off by plant photosynthesis via water vapor through the pores in the leaves (stomata)
 **Aquifer -**an underground layer of rock or soil that holds water

**Artesian Well -**a well in which water rises because of pressure within aquifer from water above

**Drought -**a long period of scarce rainfall
 **Ecological Address -**For Raleigh -the Neuse River Basin

**Glaciers -**a large mass of moving ice and snow on land

**Hydrology -**the study of water

**Icecaps -**a glacier forming on an extensive area of relatively level land and flowing outward from its center; ex. Greenland or Antarctica
 **Icebergs -**a large floating mass of  freshwater ice detached from a glacier

**Reservoir -**a man made lake that stores water for human use

**River Basin -**the region of land drained by a large river and its tributaries
 **Watershed -**the land area that supplies water to a river system from smaller areas

**Wetland -**land area that is covered with a shallow layer of water during some or all of the year
 **Tides -**the change in depth of the ocean due to the moon’s and sun’s gravitational pull of the water on earth

**Ocean Wave -**a disturbance in ocean water caused by wind

**Tsunami -**a seismic sea wave

**Surface Current -**a circulation or movement of water due to the winds; warm or cool

**Deep Current -**an underwater circulation or movement of water dut to changes in the water’s density (salinity; temperature);
cold
 **Longshore Current -**the movement of water( a river of water and sand) parallel to the beach caused by waves striking the beach at an angle

**Rip Current or Rip Tide -**the quick movement of water offshore due to a break in an offshore sandbar; caused many swimmers to drown each year
 **Abiotic Factor**the non-living factors of the environment that an organism lives in.

**Abyssal Plain -**mostly flat portion of ocean floor which provides a home to a variety of unique organisms that are adapted to the extreme conditions of this habitat.

**Aphotic Zone or Deep Zone -**lowest layer of the ocean, where light does not reach.
 **Benthos -**organisms that live on or in the ocean floor.

**Bioluminescence -**the production of non-thermal light by creatures' converting chemical energy to light energy to lure prey, attract a mate, or assist in keeping like species together. An estimated 75 percent of benthic creatures glow

**Consumer -**feed on other organisms (plant or animal) because they cannot make their own food, a heterotroph
 **Continental Shelf -**extends from the edge of the continent outward to where the bottom sharply drops off into a steep slope.

**Continental Slope -**the steep incline between the continental shelf and the abyssal plain.

**Ecosystem -**a community of different but interdependent species and their non-living environment.
 **Estuary -**body of water where a river meets the ocean
 **Fauna -**animals

**Flora -**plants

**Food Chain -**a hierarchy of food relationships from the simplest to most complex

**Habitat -**the immediate space where an animal or plant lives and has food, water and protection.

**Intertidal Zone -**the area that lies between the low-tide and the high-tide line.
 **Mid-Ocean Ridge -**a chain of undersea mountains that circles the earth through every ocean at diverging tectonic plate
boundaries

**Nekton -**free-swimming organisms whose movements are independent of the tides, currents, and waves.

**Neritic Zone -**the first 200 meters (656 feet) of ocean water, which includes the seashore and most of the continental
shelf.

 **Oceanic Zone** - extends from 200 meters (656 feet) deep all the way down to the bottom of the ocean.

**Ocean trench -**the deepest parts of the ocean. The deepest one is the Marianas Trench (located in the South Pacific Ocean -
almost 5 miles (8.05 kilometers) deep.

**Photic Zone - t**he top layer of the ocean where sunlight penetrates, above 200 meters

**Phytoplankton - t**he plant and algae component of the plankton; the primary producers of most ocean food webs.

**Producer -**a living thing that produces its own food within itself, usually by using sunlight energy in photosynthesis; an autotroph

**Salinity -**the amount of dissolved solids in seawater aprroximately 35 parts per thousand

**Upwelling -**the upward movement to the ocean surface of deeper, cold and usually nutrient-rich waters, especially along some shores, due to the offshore movement of surface waters

**Echo sounder -**a device used to determine depth by sound waves.

**Fathom -**a unit of measure for ocean depth. One fathom is 6 feet (1.83 meters).

**Oceanography -**the study and exploration of the world's ocean.

**ROV (Remotely Operated Vehicle) -**unmanned submersible tethered to a mother ship and operated by pilots using a joy stick.
 **Scuba - S**elf-**C**ontained **U**nderwater **B**reathing **A**pparatus - device that allows divers to breathe underwater for long periods of
time.

**SONAR - SO**und **NA**vigation**R**anging - used to measure ocean depth by sending sound to bounce off the ocean floor.

**Submersible -**a small submarine used to explore the ocean depths; equipped with windows, lights, mechanical arms, cameras and other scientific instruments capable of seeing and recording data.

**Populations Unit 5 Vocabulary**

Purpose: To understand the interaction among organisms in an ecosystem; to connect the flow of energy within living things to the flow of matter in our environment.

**Abiotic-** are those non-living physical and chemical factors which affect the ability of organisms to survive and reproduce ex. Sunlight, temperature, soil or rocks, availability of water, pollutants

**Biotic**- all the living factors that impact an organism ex. Disease, parasitism, predation

**Biome**- a division based on climate, plants and animals; an environment that has a characteristic type of climax community ex. Freshwater biome—all of the lake, pond, stream, & river communities on Earth

**Carrying Capacity**- is the maximum number of organisms the resources of an ecosystem can support.   The carrying capacity of the environment is limited by the available abiotic and biotic resources (**limiting factors**), as well as the ability of ecosystems to recycle the residue of dead organisms through the activities of bacteria and fungi

**Climax community**-a stable community that is in final stage of succession

**Commensalism**- a form of symbiosis in which one organism benefits and the other is not harmed

**Community**- the living part of an ecosystem composed of many species

**Competition-** the type of interaction among organism s; the struggle to obtain needed resources of food, water, shelter, . . .

**Consumer-** an organism that CANNOT make its own food

**Decomposer**-an organism that breaks down the bodies of dead organisms into simpler substances ex. Bacteria & fungi

**Dispersal**- the movement of living things from one place to another

**Ecosystem**-a unit consisting of all the living and nonliving things in a given area that interact with one another

**Endangered**- in danger of becoming extinct

**Environment**- all t he living and nonliving things with which an organism may interact

**Food Web-** a diagram that show many overlapping food chains

**Habitat**- the place in which an organism lives and obtains the resources it needs to survive

**Host**- an organism that provides a home to another organism

**Unit Six - Earth History
Absolute (radioactive)Dating** - measurement of the known rates of decay of radioactive materials that an object contains in order to determine the age of the object

**Index Fossil** - fossil known to have lived in a particular geologic age that can be used to determine the date of the rock layer in which it was found

**Law of Superposition** - states that in undisturbed rock layers that newer layer will be deposited over older layers

**Law of Crosscutting Relationships** = states rock layers that cut across other rock layers are younger than those they cut

**Relative Dating** - determining the age or order of things from the past or past events without knowing or calculating the actual age

**Sedimentary rock**- rock formed by deposition of sand, clay and other pieces of rock that are compacted together under pressure

**Uranium** - radioactive heavy metal that is an abundant source of nuclear energy that has 14 known isotopes used in radioactive dating

**Fault**- fracture along which blocks of the Earth's crust that can be caused by the shifting or dislodging of the Earth's crust. Types include normal, strike slip, or reverse

**Fossils** - remains or traces of animals, plants and other organisms from the past; usually at leat 10000 years old

**Geologic Time Scale** = system of chronological measurement that relate to the history of events in Earth's past, consisting of fossils and major events

**Ice Core** - a core sample of ice removed from a sheet of ice. Properties of the ice and the crystallized components in the ice are used to reconstruct climatic record

**Igneous rocks**- type of rock formed under or above ground when magma or lava cools

**Metamorphic rock** - rock created from the transformation of other types of rock through heat and pressure

**Adaptation** - an inherited mutation in an organism's DNA that provided an advantage for survival for a species.

**Biologic Change** - change in an organism's genetic makeup, DNA, that occurs through natural selection of advantageous traits for survival over an extended period of time.

**Biological classification**- the organization and identification of an organism from general to specific by identifying the organisms' Domain, Kingdom, Phylum, Class, Order, Genus, and Species

**Comparative anatomy** -the analysis of body structures (body systems , skeletal systems) between two or more different species that provides insight into the genetic/biologic similarities and differences across species

**Continental Plate** - the crust that makes up the continents

**Embryological similarities** - liknesses in the embryonic stage of development between different species; evidence for evolution.

**Extinction** -the complete elimination (dying out) of a species due to the species inability to survive and therefore adapt to its environment.

**Geographic Change** - the change in a geographic area caused by earthquakes, volcanoes, mountains forming, and other natural phenomena.

**Geologic Time Scale** - timeline that illustrates Earth's past. This timeline includes the divisors of the 4.6 billion years of Earth's geologic and biologic existence, and divides time into eons, eras, periods, and epochs. The divisions of the time scale are based on major events that have caused major geologic or biologic change throughout history, such as mass extinctions.

**Geology** - the study of the rocks, processes, and history of Earth

**Homologous Body Structures** - Similar body structures and systems between different species; evidence for biologic evolution

**Oceanic Plate** - the part of Earth's crust that underlies the oceans

**Plate Tectonics** -the Earth's lithosphere is broken into major and minor plates of continental or oceanic crust that are in constant motion due to their position above the convection currents of the asthenosphere. The movement of the tectonic plates is responsible for geologic and subsequent biologic change over time.

**Theory of Evolution**- the theory that organisms/species change over time, caused by the natural selection of advantageous traits for survival in a particular environment. This theory also proposes that all organisms evolved from a common ancestor.

**Adaptation** - a beneficial trait that helps an organism survive in its environment.

**Genetic Variation**- the characteristics that make members of the same species different from one another.

**Variations** - are the different forms of a trait.

**Genotype**- the genetic makeup of a cell or organism; defined by certain alleles for a particular trait.

**Offspring** - a child or animal in relation to its parent or parents.

**Phenotype** - the physical appearance that is a result of the genotype.

**Natural Selection** - explanation of how organisms in a population develop traits that allow them to survive and reproduce