SSA Study Guide - Test Date: May 4th

Power Standards: SM

- **SC.8.N.1.1 (SC.8.N.1.3, SC.6.N.1.1, SC.7.N.1.1): Students will evaluate a scientific investigation using evidence of scientific thinking and problem solving. Students will interpret and analyze data to make predictions and/or defend conclusions.**
- **SC. 7.N.1.3 (SC.6.N.1.3): Students will distinguish between an experiment and other types of scientific investigations where variables cannot be controlled.**
- **SC. 7.N.1.4: Students will identify test variables (independent variables) and outcome variables (dependent variables) in a given scientific investigation.**
- **SC. 8.N.1.4: Students will explain how hypotheses are valuable.**

1. What is the purpose of the control group?
   The control group is used to compare changes in the experimental group.
2. What is an independent variable?
   The variable that is TESTED in an experiment. Changed by the experimenter.
3. What is a dependent variable?
   The variable that is MEASURED in an experiment. It's your data!
4. What is a control variable?
   The VARIABLES that are kept the SAME/CONSTANT in order to not affect the outcome of the experiment.
5. Why can't there be more than one independent variable in an experiment?
   You will not know which variable affected the experiment.
6. On a graph, which axis represents the independent variable and which represents the dependent variable?
   Remember: DRY MIX (Dependent Responding Y-axis)/ (Manipulated Independent X-Axis)
7. What is a hypothesis? What is it based on?
   An educated guess based on prior knowledge and research.

Power Standard: SM

- **SC.7.N.1.2 (SC.6.N.1.2 , SC.8.N.1.2) : Students will differentiate between replication and repetition. Students will evaluate the use of repeated trials or replication in a scientific investigation. Students will explain why scientific investigations should be replicable.**
- **SC.6.N.1.4 : Students will compare methods and results obtained in a scientific investigation.**

1. What is replication? Give an example.
   When scientists recreate each other's experiments. An example would be when scientists and researchers continue to prove theories to make them laws.
2. What is repetition? In an experiment, how is repetition represented?
   TRIALS in an experiment.

Power Standard: SM

- **SC.6.N.2.2(SC.8.N.1.5), SC.7.N.2.1(SC.7.N.1.7): Students will explain that scientific knowledge may change as new evidence is discovered or new scientific interpretations are formed. Students will identify instances in the history of science in which scientific knowledge has changed as a result of new evidence.**
- **SC.8.N.1.6 (SC.7.N.1.6): Students will explain that scientific explanations are based on empirical evidence, logical reasoning, predictions, and modeling.**

1. What is the importance of models in science?
   Models allow for us to investigate topics that we would not otherwise be able to see. For instance, we study models of an atom because we cannot see them.
2. Give an example of how scientific knowledge has changed as a result of new evidence.
   Pluto was once thought of as a planet until further research showed that it does not truly have the characteristics of a planet, therefore, causing it to be demoted as a planet in 2006.

Power Standard: SM

- **SC.7.N.3.1 (SC.6.N.3.1): Students will explain the difference between theories and laws. Students will identify examples of theories and laws.**
- **SC.8.N.3.2: Students will explain why theories may be modified but are rarely discarded.**

1. What is the difference between a law and a theory? Given an example of each.
   Theory: A well-substantiated explanation acquired through the scientific method and repeatedly tested and confirmed through observation and experimentation. Example: "When the sun is out, it tends to make it bright outside."
   Law: A statement based on repeated experimental observations that describes some phenomenon of nature. Proof that something happens and how it happens, but not why it happens. Example: Newton's Law of Universal Gravitation.

Power Standard: Earth Science
- **SC.8.E.5.3: Students will compare and contrast the relative distance, relative size, and general composition of astronomical bodies in the universe.**
- **SC.8.E.5.1: Students will describe distances between objects in space in the context of light and space travel.**
- **SC.8.E.5.2: Students will describe that the universe contains billions of galaxies and stars.**

1. List the astronomical objects in order from largest to smallest: galaxy, planet, universe, and moon.
   universe, galaxy, planet, moon
2. What unit of measure is used between objects in our solar system?
   astronomical units (AU)
3. What unit of measure is used outside of our solar system?
   light years (LY)
4. How many galaxies are there in the universe? How many stars are in galaxies?
   BILLIONS!!

Power Standard: Earth Science
- **SC.8.E.5.5 : Students will describe and classify physical properties of stars: apparent magnitude, temperature (color), size, and absolute brightness**
- **SC.8.E.5.6: Students will evaluate models of solar properties and explain solar characteristics, including rotation, structure of the Sun, convection, sunspots, solar flares, and prominences.**

1. What is the difference between apparent and absolute magnitude?
   Apparent – how bright the star appears to be from EARTH/ absolute – how bright the star ACTUALLY is
2. What determines the temperature of a star?
   The color of the star.
3. Be able to read the HR diagram. Review Tier Work
4. Review layers of the Sun. Review Tier Work.

Power Standard: Earth Science
- **SC.8.E.5.7 : Students will compare and contrast the characteristics of objects in the Solar System.**
- **SC.8.E.5.4: Students will identify and explain the role that gravity plays in the formation and motion of planets, stars, and solar systems.**
- **SC.8.E.5.8: Students will compare and contrast various historical models of the Solar System.**

1. Review your LOG BOOK.
2. What is gravity's role in the formation of the solar system? What is its current role?
   Gravity brought all the "stuff" in space together to form the stars, planets, etc. Currently, it is used to create new stars in nebulae and keep everything in orbit.
3. What is the difference between geocentric and heliocentric models of the solar system?
   Geocentric – Earth centered/ Heliocentric – Sun-centered

Power Standard: Earth Science
- **SC.8.E.5.9 : Students will explain the effect of astronomical bodies on each other including the Sun's and the Moon's effects on Earth**

Review moon phases, tides, and seasons.

Power Standard: Earth Science

- **SC.7.E.6.2: Students will identify and describe steps of the rock cycle and relate them to surface and sub-surface events.**
- **SC.6.E.6.1: Students will describe and explain how Earth's surface is built up and torn down through the processes of physical and chemical weathering, erosion, and deposition.**
- **SC.6.E.6.2: Students will identify different types of landforms commonly found on Earth. Students will describe similarities and differences among landforms found in Florida and those found outside of Florida.**
- **SC.7.E.6.6: Students will identify and describe the impact that humans have had on Earth.**

1. How is sedimentary rock formed?
   Sediment (weathered and eroded rock particles) come together through a process called deposition, then pressure is applied.
2. How is metamorphic rock formed?
   Heat and pressure are added to sedimentary rock.
3. How is igneous rock formed?
   Rock is melted and cooled. Crystallization happens.
4. What is the difference between weathering, erosion, and deposition?
   http://www.tutorialsolutions.com/esWEDNotes.htm (see the following website)
5. Describe sinkholes.
   Sinkholes are pits in the ground that form in areas where water gathers without external drainage. Sinkholes mainly occur as water drains below ground. It can dissolve subterranean caverns, particularly in areas where the bedrock is made of water-soluble evaporate rocks such as salt or gypsum or of carbonate rocks such as limestone or dolomite. Sinkholes can be natural or man-made. Natural sinkholes occur due to erosion or underground water.
6. What are positive impacts that humans have had on Earth? What's the result of these impacts?
   Use this website and other resources.
   http://greenliving.lovetoknow.com/How_Do_Humans_Affect_the_Environment
7. What are negative impacts that humans have had on Earth? What's the result of these impacts?
   Use this website and other resources.
   http://greenliving.lovetoknow.com/How_Do_Humans_Affect_the_Environment

Power Standard: Earth Science

- **SC.7.E.6.4: Students will identify examples of and explain physical evidence that supports scientific theories that Earth has evolved over geologic time due to natural processes.**
- **SC.7.E.6.3: Students will identify and describe current scientific methods for measuring the age of Earth and its parts.**

1. Looking at a cross-section of the Earth, the oldest fossils would be found where? Explain.
   The oldest fossils are at the bottom. This is due to the fact that fossils are found in sedimentary rock in which the top layers are the newest layers.

Power Standard: Earth Science

- **SC.7.E.6.5 (SC.7.E.6.7): Students will describe the scientific theory of plate tectonics and how the movement of Earth's crustal plates and the flow of heat and material cause various geologic events to occur.**
- **SC.7.E.6.1: Students will identify and/or describe the layers of Earth**

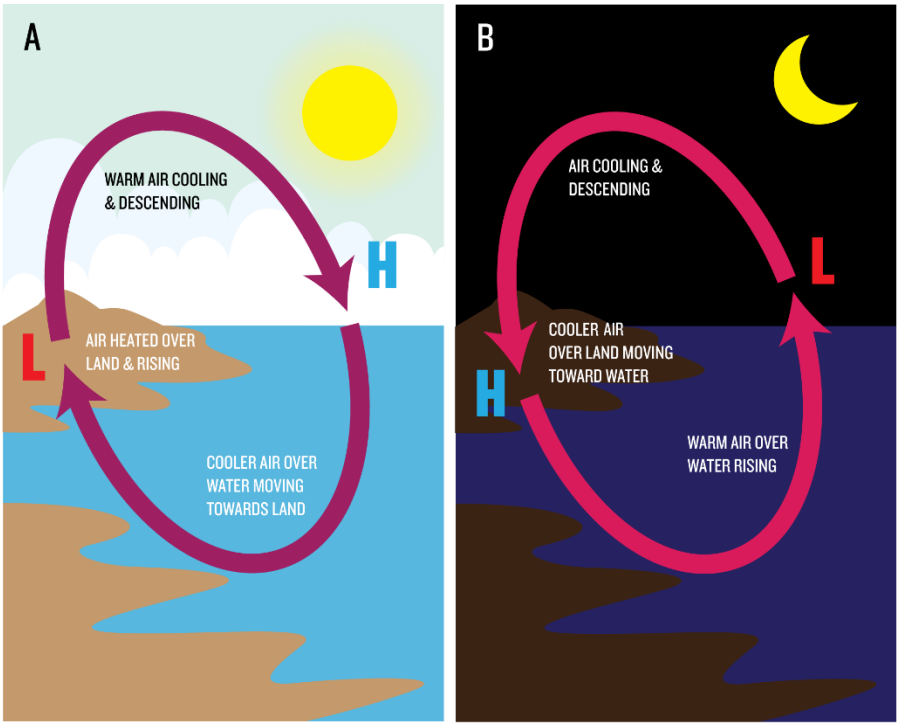
1. What is a convergent boundary? What do they create?
   See the following website. http://www.cotf.edu/ete/modules/msese/earthsysflr/plates2.html
2. What is a divergent boundary? What do they create?
   See the following website. http://www.cotf.edu/ete/modules/msese/earthsysflr/plates3.html
3. What is a transform boundary? What do they create?
   See the following website. http://www.cotf.edu/ete/modules/msese/earthsysflr/plates4.html
4. What are the layers of the Earth from the center to the outside?
   Use the following website. https://www.learner.org/interactives/dynamicearth/structure.html
5. Which layer of the Earth is the thickest?
   The mantle.
6. Which layer of the Earth is the densest?
   The core.

7. Which layer of the Earth is the hottest?
   The core.

Power Standard: Earth Science

- **SC.6.E.7.4: Students will differentiate and explain interactions among the geosphere, hydrosphere, cryosphere, atmosphere, and biosphere.**
- **SC.6.E.7.2 (SC.6.E.7.3): Students will describe and explain how the cycling of water and global patterns influence local weather and climate.**
- **SC.6.E.7.6: Students will differentiate between weather and climate.**
- **SC.6.E.7.9: Students will describe the composition and structure of the atmosphere and how the atmosphere protects life and insulates the planet.**

1. Describe geosphere, hydrosphere, cryosphere, atmosphere, and biosphere.
   See the power point in your Earth Science Review folder on Edmodo.
2. Describe jet streams and their impact on weather.
   See the following website. http://www.srh.noaa.gov/jetstream/global/jet.html
3. What is the difference between land breeze and sea breeze.

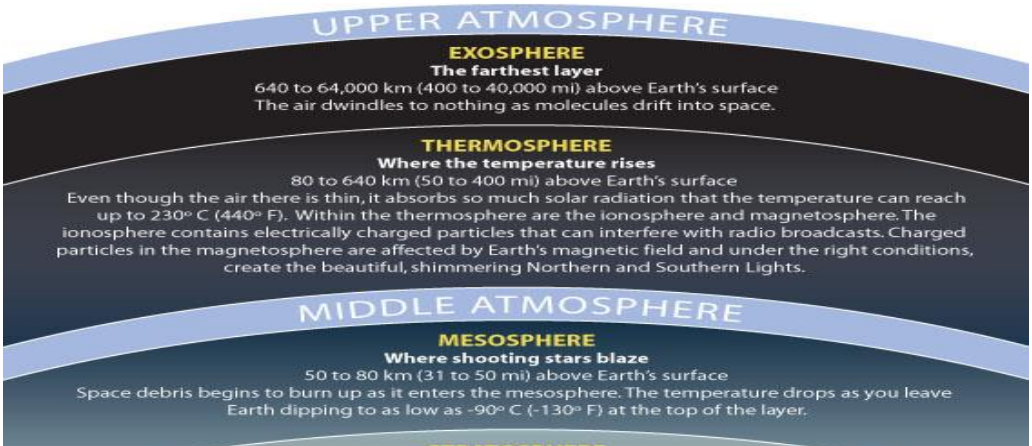


In the day, when the sun is up, the land heats up very quickly and the air above it warms up a lot more than the air over the water. The warm air over the land is less dense and begins to rise. Low pressure is created.

The air pressure over the water is higher with cold dense air, which moves to occupy the space created over the land. The cool air that comes along is called a sea breeze.

In the night, the reverse happens. The land quickly loses its' heat whiles the water retains its' warmth. This means the air over the water is warmer, less dense and begins to rise. Low pressure is created over the water. Cold and dense air over the land begins to move to the water surface to replace the warmer rising air. The cool breeze from the land is called a land breeze.

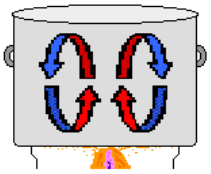
4. What is the difference between weather and climate?
   The difference between weather and climate is a measure of time. Weather is what conditions of the atmosphere are over a short period of time, and climate is how the atmosphere "behaves" over relatively long periods of time.
5. What are the layers of our Earth's atmosphere?



Power Standard: Earth Science

- **SC.6.E.7.5: Students will explain how energy provided by the Sun influences global patterns of atmospheric movement and the temperature differences among air, water, and land.**
- **SC.6.E.7.1: Students will differentiate among radiation, conduction, and convection in Earth's systems.**

1. What is radiation? Give an example.
   Radiation is the transfer of heat by means of electromagnetic waves. Think EM Spectrum Song ☺
2. What is convection? Given an example.
   Convection is the process of heat transfer from one location to the next by the movement of fluids. The moving fluid carries energy with it. The fluid flows from a high temperature location to a low temperature location.
3. What is conduction? Give an example.

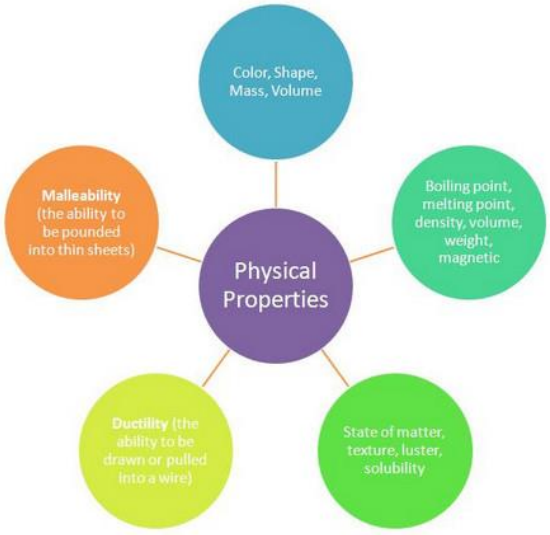


Heated water rises from the bottom to the top of the pot. Cold water replaces the rising water.

Power Standard: Physical Science

- **SC.8.P.8.4: Students will classify and compare substances on the basis of their physical properties and explain that these properties are independent of the amount of the sample.**
- **SC.8.P.8.3: Students will describe density and calculate and compare the densities of various materials using the materials' masses and volumes**

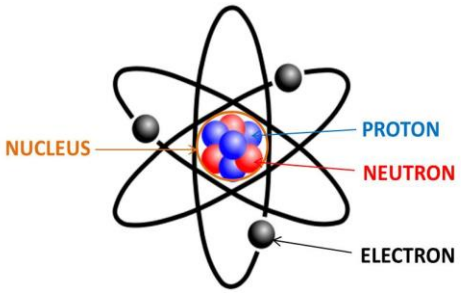
1. What is a physical property? Give 4 examples of a physical property?
   See image to the right.
2. Does the amount of a substance affect an object's density? Explain.
   No. Density is mass/volume. If you cut an object in half or double it, you're going to cut the mass and volume in half, or double it.
3. What is density?
   D = m/V
4. When do objects sink? Float?
   Objects/substances sink when they are denser than the object/substance they are in combination with. They float with they are less dense.



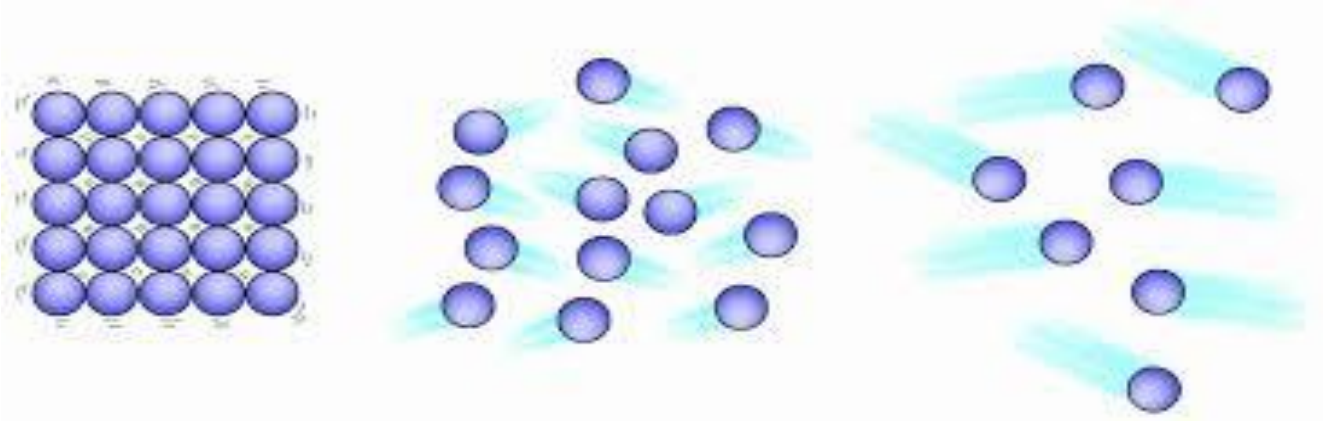
Power Standard: Physical Science

- **SC.8.P.8.7: Students will explain that atoms are the smallest unit of an element and are composed of subatomic particles.**
- **SC.8.P.8.5: Students will describe how elements combine in a multitude of ways to produce compounds that make up all living and nonliving things.**
- **SC.8.P.8.9: Students will differentiate among pure substances, mixtures, and solutions.**
- **SC.8.P.8.1: Students will describe the motion of particles in solids, liquids, and/or gases.**
- **SC.8.P.8.6: Students will explain that elements are grouped in the periodic table according to similarities of their properties.**
- **SC.8.P.8.8: Students will identify common exs of acids, bases, salts. Students will compare, contrast, and classify the properties of compounds, including acids and bases.**

1. Label the parts of an atom: protons, electron, and neutrons.
   See image to the right.
2. What are compounds made of?
   Compounds are made of elements.
3. What is the difference between a pure substance and mixture?
   A pure substance is a material that is composed of only one type of particle; examples of a pure substance include gold, oxygen and water. A mixture a material made up of at least two different pure substances.



4. What is the difference between a homogeneous and heterogeneous mixture?
   See the following website. http://chemistry.elmhurst.edu/vchembook/106Amixture.html
5. What is a solution made of? Describe the parts. Give an example.
   A solution is a mixture of two or more substances in a single phase. At least two substances must be mixed in order to have a solution. The substance in the smallest amount and the one that dissolves or disperses is called the SOLUTE. The substance in the larger amount is called the SOLVENT. In most common instances water is the solvent. The gases, liquids, or solids dissolved in water are the solutes. Air, Carbon Dioxide (CO_2) in Soda, Hydrogen (H_2) in Palladium (Pd) Metal, Gasoline, Dental Fillings, Metal Alloys Such as Sterling Silver.
6. Describe the motion of the particles of a solid, liquid, and gas?



7. What do all elements in a group on the periodic table have in common?
   They all have the same properties.
8. Where are metals, nonmetals, and metalloids on the periodic table?
   Metals are left of the "zig-zag" line, nonmetals are to the right, and metalloids are touching the "zig-zag" line.
9. Describe differences between acids and bases.
   See the following website. http://www.chem4kids.com/files/react_acidbase.html

Power Standard: Physical Science

- **SC.8.P.9.2: Students will differentiate between physical and chemical changes.**
- **SC.8.P.9.1: Students will explain that mass is conserved when substances undergo physical and chemical changes, according to the Law of Conservation of Mass.**
- **SC.8.P.9.3: Students will describe how temperature influences chemical changes.**

1. What is the difference between physical and chemical changes? Give an example of each.
   Chemical and physical changes are related to chemical and physical properties.
   Chemical Changes
   Chemical changes take place on the molecular level. A chemical change produces a new substance. Another way to think of it is that a chemical change accompanies a chemical reaction. Examples of chemical changes include combustion (burning), cooking an egg, rusting of an iron pan, and mixing hydrochloric acid and sodium hydroxide to make salt and water.
   Physical Changes
   Physical changes are concerned with energy and states of matter. A physical change does not produce a new substance, although the starting and ending materials may look very different from each other. Changes in state or phase (melting, freezing, vaporization, condensation, sublimation) are physical

changes. Examples of physical changes include crushing a can, melting an ice cube, and breaking a bottle.

2. What are some indications that a chemical change has occurred?
   The following are indicators of chemical changes:
   - Change in Temperature.
   - Change in Color.
   - Noticeable Odor (after reaction has begun)
   - Formation of a Precipitate.
   - Formation of Bubbles.
3. How does temperature affect a chemical change?
   The more they move, the more collisions occur, and the more reactions occur between the chemicals = faster reaction rate. Increasing the temperature will cause chemical changes to occur faster. Decreasing the temperature, causes the particles to lose energy which causes them to move around less and slower.
4. State the Law of Conservation of Mass.
   According to this law, during any physical or chemical change, the total mass of the products remains equal to the total mass of the reactants.

Power Standard: Physical Science

- **SC.7.P.10.1: Students will identify, compare and contrast the variety of types of radiation present in radiation from the Sun.**
- **SC.8.E.5.11: Students will identify and compare characteristics of the electromagnetic spectrum. Students will identify common uses and applications of electromagnetic waves**.

1. What is the EM Spectrum in order from least energy to most energy.
   Radio waves, microwave, infrared radiation, visible light, UV, X-ray, Gamma Ray

2. Describe uses of each form of radiation on the EM spectrum.

Electromagnetic radiation	Uses	
Radio waves	Broadcasting and communications – their longer wavelength means they travel further in the Earth's atmosphere, reflecting off hills and the upper atmosphere.	
Microwaves	Cooking food – microwaves are absorbed by water molecules causing them to vibrate (heat up). Satellite transmissions – their wavelength penetrates our atmosphere.	
Infrared	Heater and night vision equipment – all objects, including people, give out infrared rays which can be detected even at night. It's also used for television remote controls.	
Visible light	Human vision, photography and optical fibres – it's the only part of the spectrum we can see.	
Ultraviolet	Fluorescent lamps – they have chemicals inside them which absorb ultraviolet rays and convert the energy to visible light.	
X-rays	Medical equipment – they enable us to see the internal structure of objects and materials by passing through some substances (eg body tissue) but being absorbed by others (eg bone).	
Gamma rays	Sterilising food and medical equipment – they are highly penetrative and can kill.	

Power Standard: Physical Science

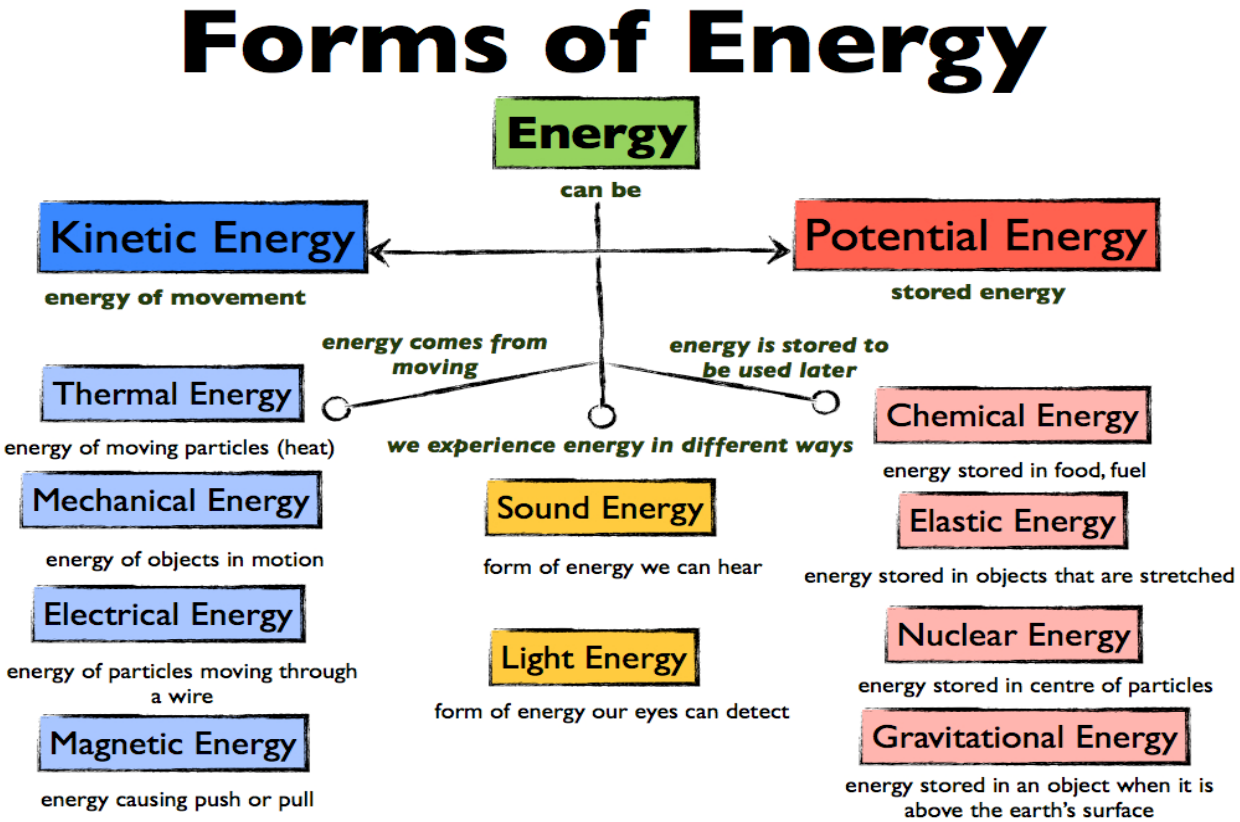
- **SC.7.P.10.3: Students will describe and explain that waves move at different speeds through different materials.**
- **SC.7.P.10.2: Students will explain that light waves can be reflected, refracted, and absorbed.**

1. Explain how refraction works. Give an example.
   See the following website. http://www.physicsclassroom.com/class/refrn/Lesson-1/The-Cause-of-Refraction
2. What is reflection? Give an example.
   See the following website. http://www.physicsclassroom.com/class/refln/Lesson-1/The-Law-of-Reflection
3. What is absorption? Give an example.
   See the following website. http://www.britannica.com/science/absorption-physics

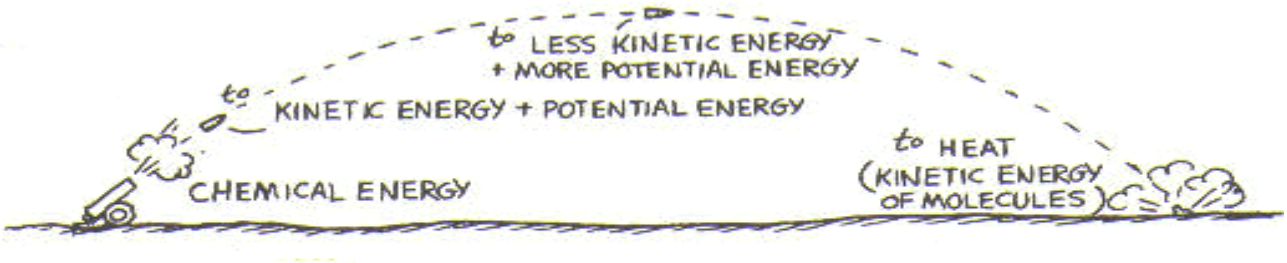
Power Standard: Physical Science

- **SC.7.P.11.2: Students will identify and describe the transformation of energy from one form to another.**
- **SC.6.P.11.1: Students will differentiate between potential and kinetic energy. Students will identify and explain situations where energy is transformed between kinetic energy and potential energy.**
- **SC.7.P.11.3: Students will identify and describe examples of the Law of Conservation of Energy.**

1. Describe the multiple types of energy: mechanical, radiant, chemical, thermal, electrical, etc.



2. What is the difference between potential and kinetic energy.
   See above diagram.
3. Explain and give an example the Law of Conservation of Energy.



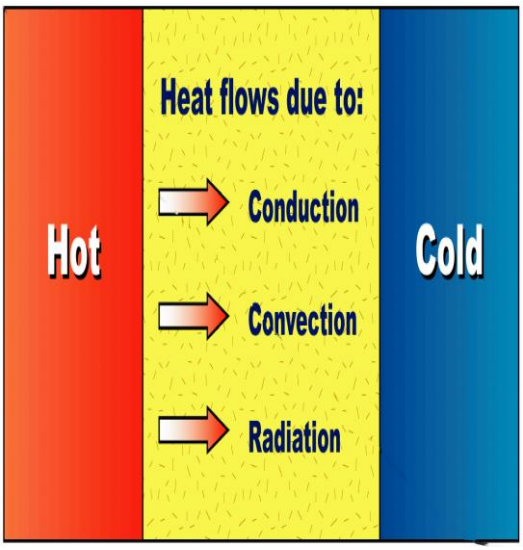
Energy Cannot Be Created or Destroyed

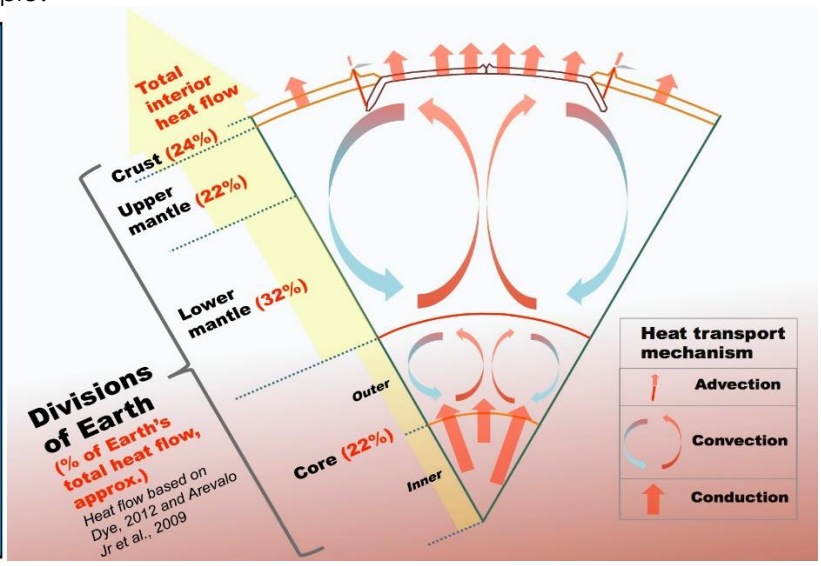
(It just changes forms)

Power Standard: Physical Science

- **SC.7.P.11.4: Students will describe how heat flows in predictable ways.**
- **SC.7.P.11.1: Students will explain that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state**

1. How does heat move? Given an example.





Power Standard: Physical Science

- **SC.6.P.13.1: Students will identify and describe types of forces.**
- **SC.6.P.13.2: Students will describe the relationship among distance, mass, and gravitational force between any two objects.**
- **SC.8.P.8.2: Students will differentiate between mass and weight**

1. Describe the following contact forces: applied, friction, spring, tension, etc.
   See the following website. http://www.physicsclassroom.com/class/newtlaws/Lesson-2/Types-of-Forces
2. What is the difference between a contact and noncontact force?
   See link above.
3. How does mass and distance between objects effect gravity?
   The more mass the more gravitational pull. The closer objects are the more gravitational pull.
4. What is the difference between mass and weight?
   Mass is the amount of matter in an object (stays the same) and weight is a due to gravitational pull (changes).

Power Standard: Physical Science

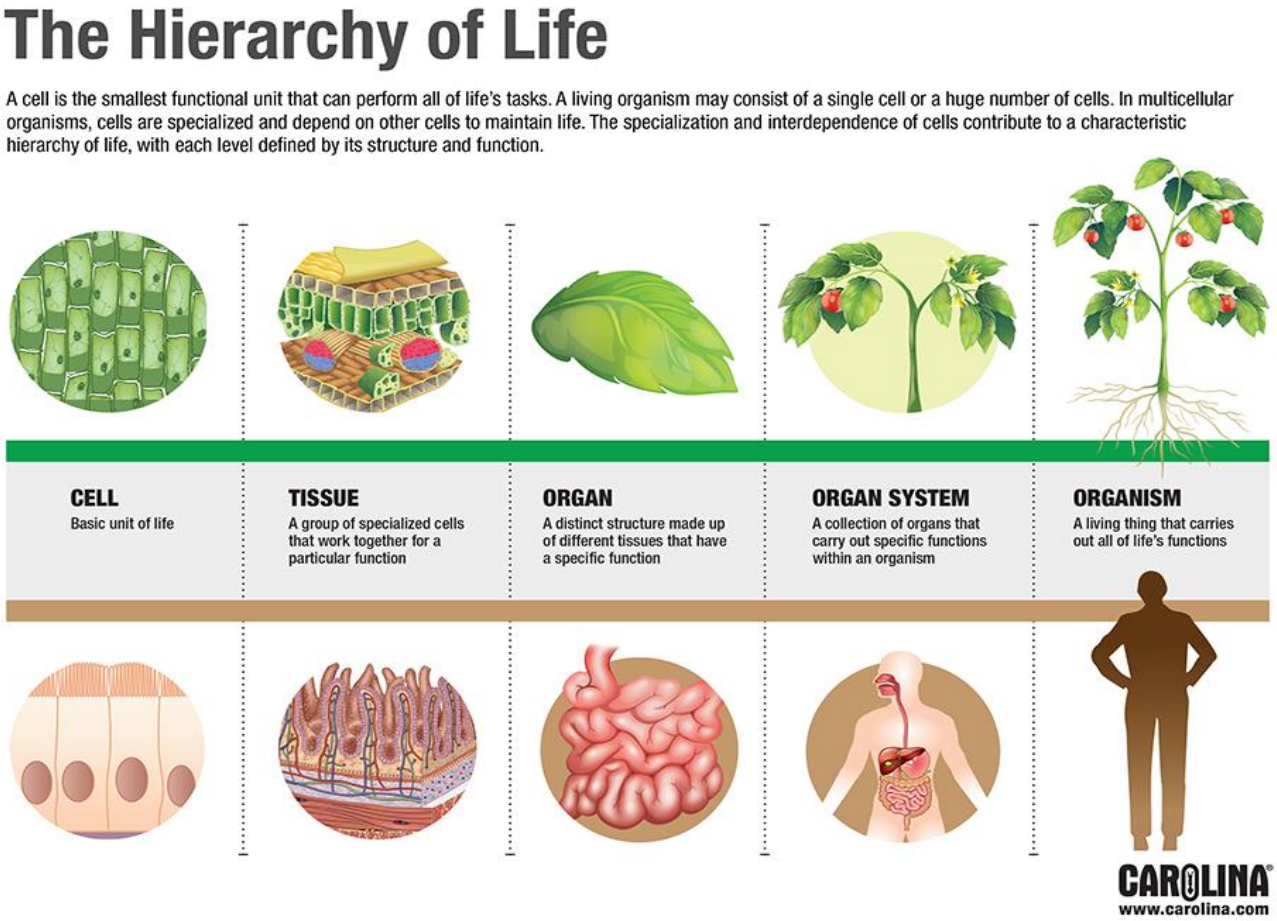
- **SC.6.P.13.3: Students will describe and explain that an unbalanced force acting on an object changes its speed and/or direction.**
- **SC.6.P.12.1: Students will interpret and analyze graphs of distance and time for an object moving at a constant speed.**

1. Be able to interpret a speed graph.
   See physical science reference guide (given to you in class).

Power Standard: Life Science

- **SC.6.L.14.1: Students will identify and/or describe patterns in the hierarchical organization of organisms, from atoms to molecules, to cells, to tissues, to organs, to organ systems, to organisms**

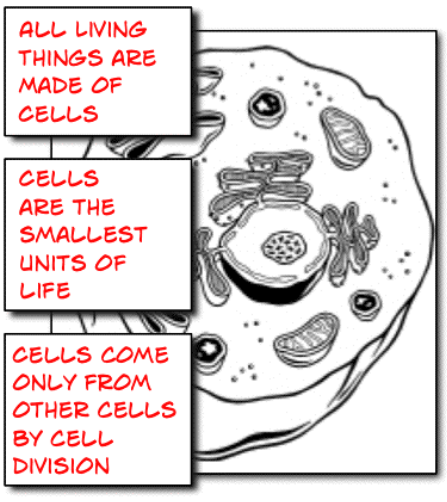
1. What is the hierarchy of an organism?



Power Standard: Life Science

- **SC.6.L.14.2: Students will identify, describe, and explain the components of cell theory.**
- **SC.6.L.14.3: Students will describe how cells undergo similar processes to maintain homeostasis.**

1. What is the cell theory?

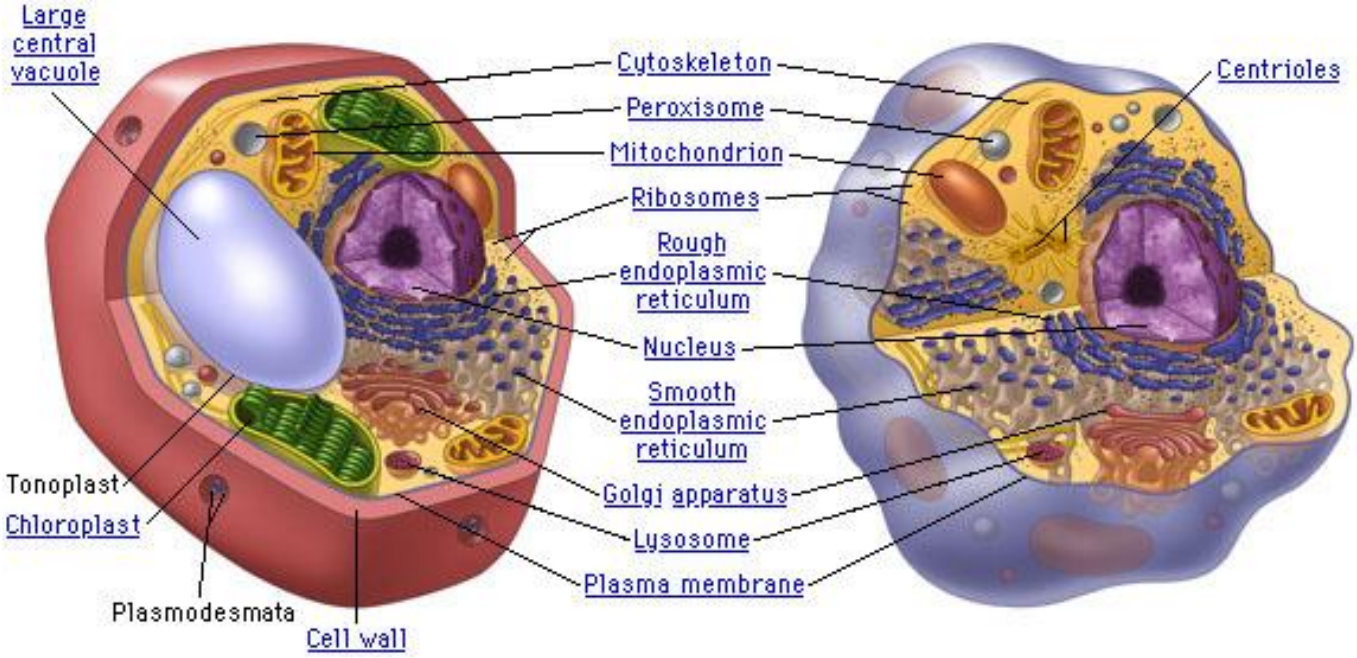


2. What do cells do to maintain homeostasis?
   See the website. http://biologyfunfacts.weebly.com/homeostasis-and-cell-transport.html

Power Standard: Life Science

- **SC.6.L.14.4: Students will compare and/or contrast the structure and function of major organelles of plant and animal cells.**

1. List similarities and differences between an animal cell and a plant cell.



2. Describe the function of the major organelles of each type of cell.

CELL ORGANELLES

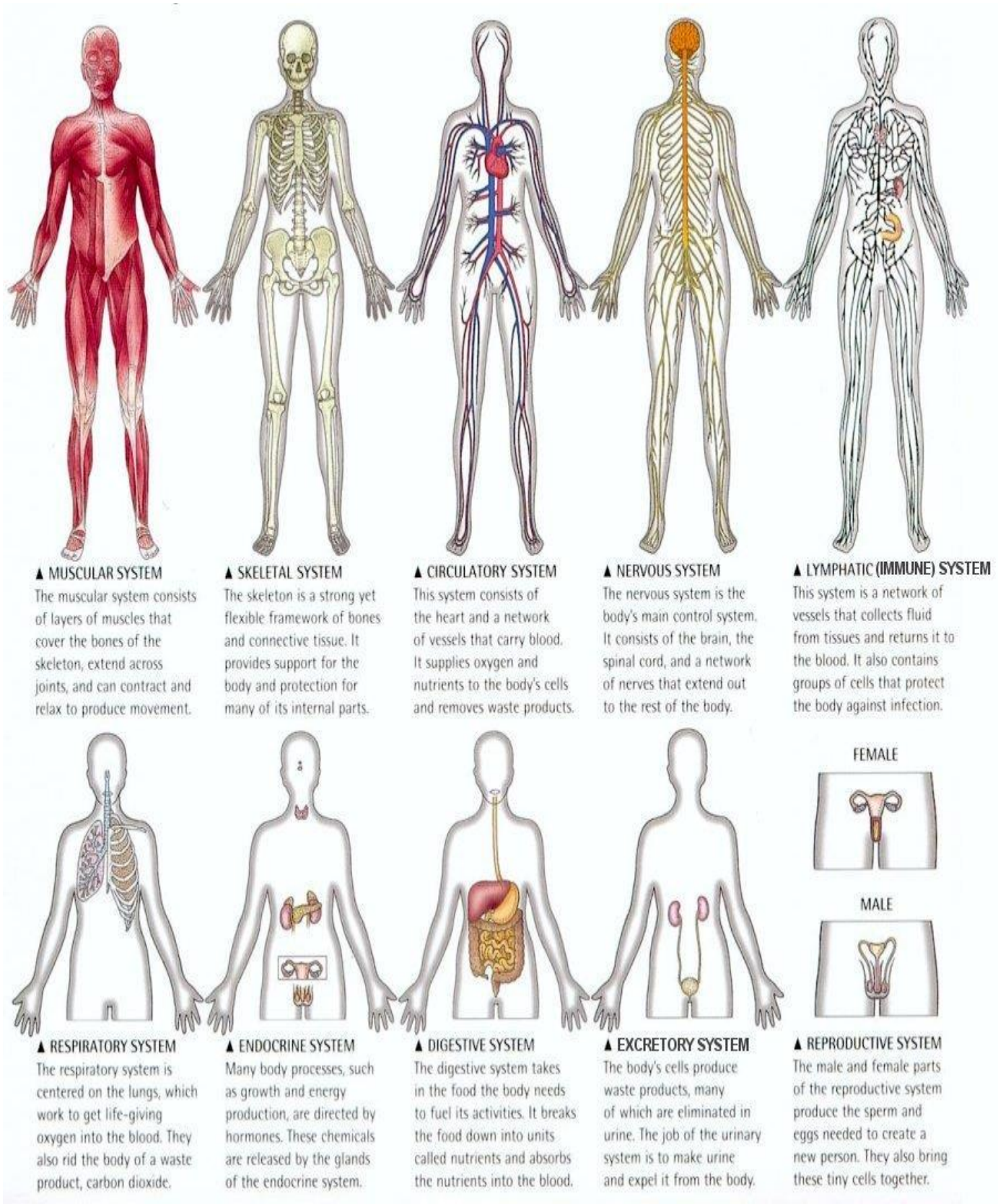
ORGANELLE	LOCATION	DESCRIPTION	FUNCTION
CELL WALL	Plants cells only	OUTER LAYER , RIGID, STRONG, STIFF, NON-LIVING	*Protects and Support Cell * Allows oxygen and water to pass through
CELL MEMBRANE	Both plants and animal cells	Plant - inside cell wall Aniimal - outer layer	Controls what comes in and out of the cell
NUCLEUS	Plant and Animal Cells	Rounded shape surrounded by rest of organelles	Controls the cells activities
CYTOPLASM	Both plants and animal cells	Clear gel-like fluid	Home to the cell's organelles
MITOCHONDRIA	Both plants and animal cells	Bean shaped with inner membrane	Breaks down sugar molecules to create energy
ENDOPLASMIC RETICULUM	Both plants and animal cells	Network of folded tubes or membranes	Carries protein and other materials from one part of the cell to another
RIBOSOMES	Both plants and animal cells	Small bodies floating free or attached to the endoplasmic reticulum	Produces proteins
GOLGI BODIES	Both plants and animal cells	Flattened sacs or tubes	Receives proteins and other materials from the Endoplasmic Reticulum and packages them and then redistributes them
CHLOROPLASTS	Plants cells only	Green, oval structures usually containing chlorophyll	Captures energy from sunlight and uses it to produce food for cells
VACUOLES	Both plants and animal cells	Fluid-filled sacs	Storage area for cells
LYSOSMES	Plants cells -uncommom Animal cells - common	Small round structures	Use chemicals to break down large food particles into smaller ones, and breaks down old cells.

Power Standard: Life Science

- **SC.6.L.14.5: Students will identify and/or describe the general functions of the major systems of the human body. Students will identify and/or describe how the major systems of the human body interact to maintain homeostasis.**

- **SC.6.L.14.6: Students will identify, compare, and/or contrast the types of infectious agents that affect the human body**

1. Identify the major organ systems in the body and describe their functions.



▲ MUSCULAR SYSTEM
The muscular system consists of layers of muscles that cover the bones of the skeleton, extend across joints, and can contract and relax to produce movement.

▲ SKELETAL SYSTEM
The skeleton is a strong yet flexible framework of bones and connective tissue. It provides support for the body and protection for many of its internal parts.

▲ CIRCULATORY SYSTEM
This system consists of the heart and a network of vessels that carry blood. It supplies oxygen and nutrients to the body's cells and removes waste products.

▲ NERVOUS SYSTEM
The nervous system is the body's main control system. It consists of the brain, the spinal cord, and a network of nerves that extend out to the rest of the body.

▲ LYMPHATIC (IMMUNE) SYSTEM
This system is a network of vessels that collects fluid from tissues and returns it to the blood. It also contains groups of cells that protect the body against infection.

▲ RESPIRATORY SYSTEM
The respiratory system is centered on the lungs, which work to get life-giving oxygen into the blood. They also rid the body of a waste product, carbon dioxide.

▲ ENDOCRINE SYSTEM
Many body processes, such as growth and energy production, are directed by hormones. These chemicals are released by the glands of the endocrine system.

▲ DIGESTIVE SYSTEM
The digestive system takes in the food the body needs to fuel its activities. It breaks the food down into units called nutrients and absorbs the nutrients into the blood.

▲ EXCRETORY SYSTEM
The body's cells produce waste products, many of which are eliminated in urine. The job of the urinary system is to make urine and expel it from the body.

▲ REPRODUCTIVE SYSTEM
The male and female parts of the reproductive system produce the sperm and eggs needed to create a new person. They also bring these tiny cells together.

2. Compare and contrast bacteria, fungus, and virus.

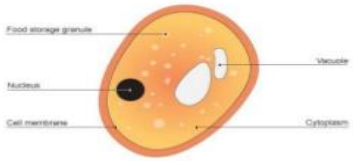
Fungi, Bacteria and Virus

Many living things are so small that they can only be seen through a microscope. These living things are called **microorganisms** or **microbes**. There are three main types of microbe:

- fungi
- bacteria
- viruses

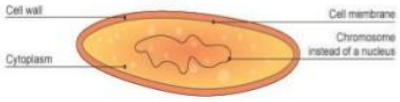
Fungi

Mushrooms and toadstools are fungi, but these are made of lots of cells, so they are not microbes. Yeasts are single-celled fungi, so they are microbes. Fungi are usually the biggest type of microbe. If there is just one of them, we call it a fungus.



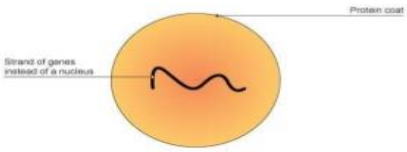
Bacteria

Bacteria are usually smaller than fungi. If there is just one of them, we call it a **bacterium**. Bacteria have many different shapes. Some have 'tails' (called flagella) that let them swim.



Viruses

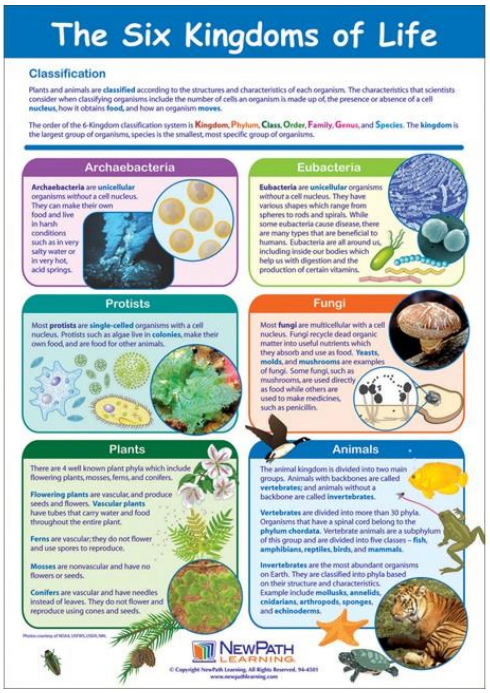
Viruses are the smallest type of microbe. As a virus can only reproduce inside a cell, some people are not convinced that viruses are really living things.

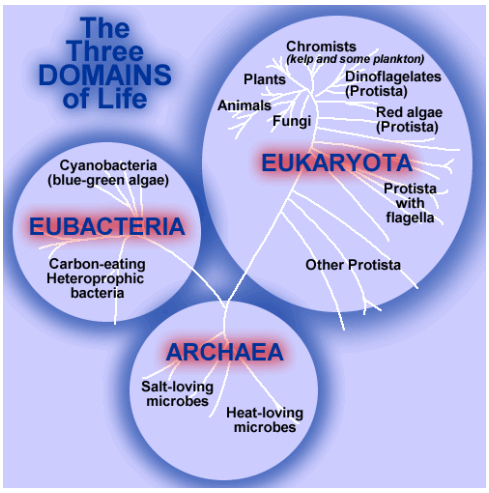


Power Standard: Life Science

- **SC.6.L.15.1: Students will analyze and/ describe how and why organisms are classified.**

1. What are the three domains? See image to the right.
2. Describe each of the six kingdoms. See image to the right. You will have to zoom in!





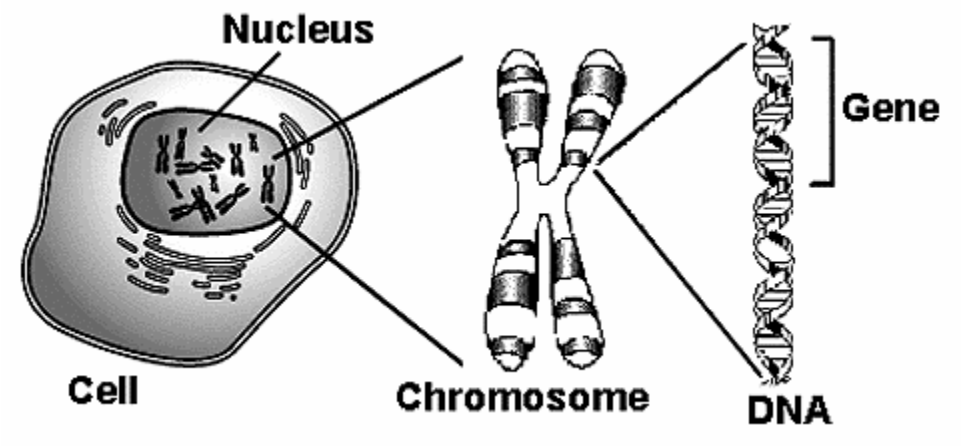
Power Standard: Life Science

- **SC.7.L.15.2: Students will identify and explain ways in which genetic variation and environmental factors contribute to evolution by natural selection and diversity of organisms.**
- **SC.7.L.15.1: Students will identify and explain ways in which fossil evidence is consistent with the scientific theory of evolution.**
- **SC.7.L.15.3: Students will identify and explain how a species' inability to adapt may contribute to the extinction of that species**

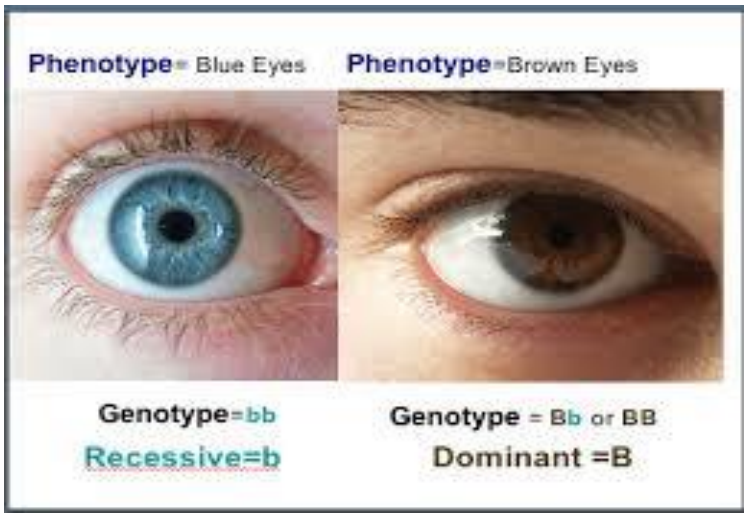
Power Standard: Life Science

- **SC.7.L.16.1: Students will describe and explain that every organism requires a set of instructions that specifies its traits. Students will identify and explain that hereditary information (DNA) contains genes located in the chromosomes of each cell and that heredity is the passage of these instructions from one generation to another.**
- **SC.7.L.16.2: Students will use Punnett squares and pedigrees to determine genotypic and phenotypic probabilities.**
- **SC.7.L.16.3: Students will compare and contrast general processes of sexual and asexual reproduction that result in the passage of hereditary information from one generation to another.**

1. Explain the relationship between genes, chromosomes, and DNA.



2. Review how to read a pedigree.
3. Review how to complete a Punnett square.
4. What is genotype?

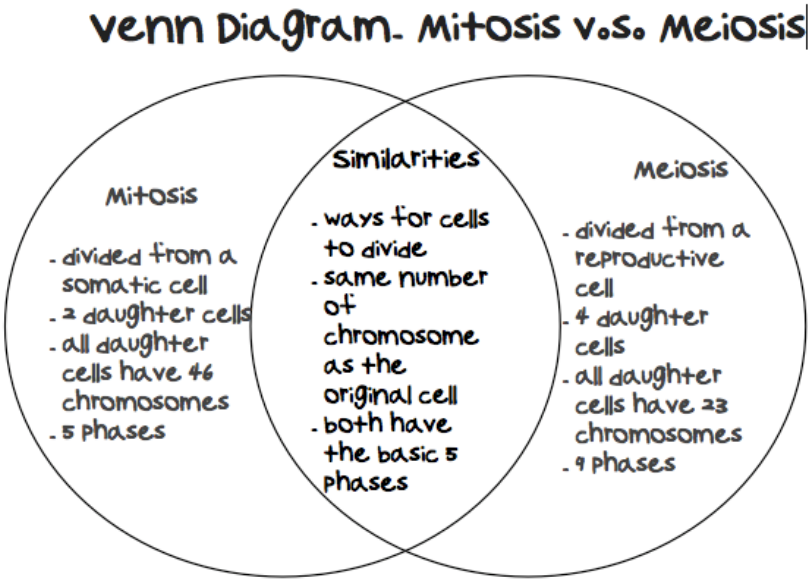


5. What is a phenotype?
   Physical appearance of a trait based on genotype.
6. What is the difference between homozygous and heterozygous?
   Homozygous is the same alleles in a genotype and heterozygous is different alleles in a genotype.

7. Explain the advantages and disadvantages of sexual and asexual reproduction.

	ASEXUAL	SEXUAL
Advantages	* Much faster process * Population can grow quickly * Little energy is required * No need to search for a mate * Less likely for errors to occur * Less danger involved	* Genetic variation within the species * Less likely to go extinct * Selective breeding is possible (choosing best traits for next generation) * Freedom of mate selection
Disadvantages	* Lacks genetic variation (because offspring is an exact copy) * Species is more vulnerable to extinction due to environmental change * If parent has disease, offspring has it too	* Slower process * Lots of energy required * Mate required – can be difficult to find * Greater chance of error (harmful mutations)

8. What are the differences between meiosis and mitosis.



Power Standard: Life Science

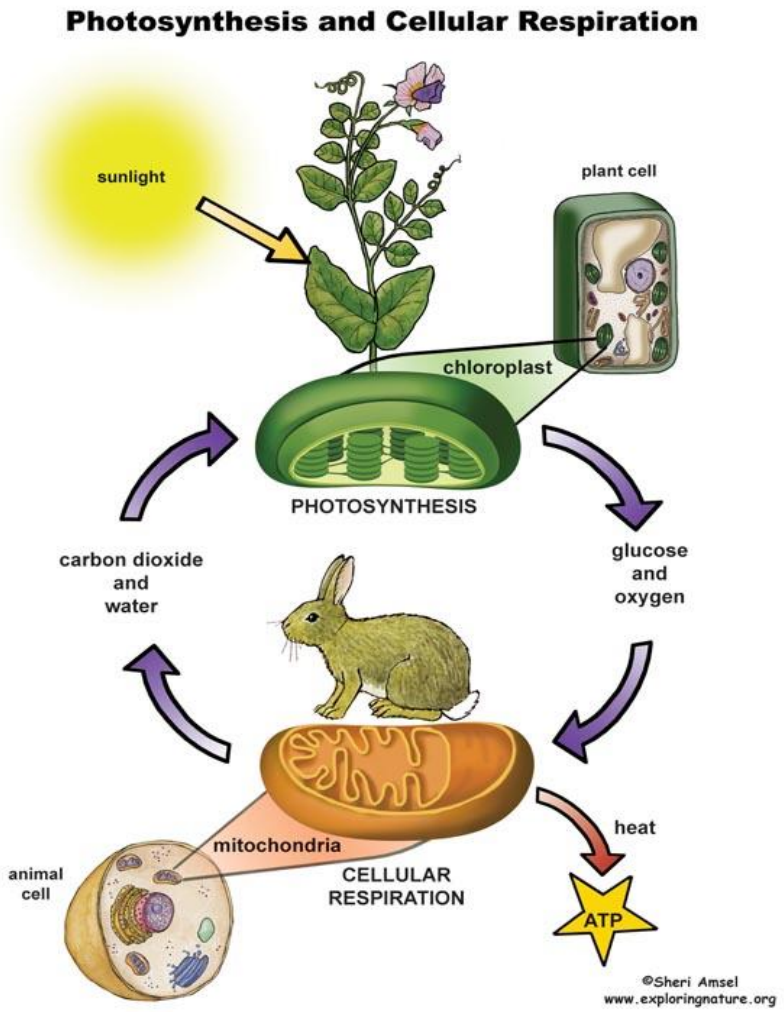
- **SC.7.L.17.2 : Students will compare and contrast relationships between organisms, such as mutualism, predation, parasitism, competition, and commensalism.**
- **SC.7.L.17.1: Students will describe and explain the roles of and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.**
- **SC.7.L.17.3: Students will identify and describe various limiting factors in an ecosystem and their impact on native populations**

1. Describe mutualism, predation, parasitism, competition, and commensalism.
   See the following website. http://www.biology4kids.com/files/studies_relationships.html
2. Describe producers, consumer, and decomposers.
   See the following website. http://www.geography4kids.com/files/land_foodchain.html
3. What are limiting factors?
   Factors that limit growth in an ecosystem.

Power Standard: Life Science

- **SC.8.L.18.4: Students will explain that living systems obey the Law of Conservation of Mass and the Law of Conservation of Energy.**
- **SC.8.L.18.1 (SC.8.L.18.2): Students will describe and explain the general processes of photosynthesis and cellular respiration. Students will describe the role of light, carbon dioxide, water, and chlorophyll in the process and products of photosynthesis**
- **SC.8.L.18.3: Students will describe how matter and energy are transferred in the carbon cycle.**

1. Describe the process of photosynthesis and cellular respiration.



2. What is the role of chlorophyll in photosynthesis?
   Traps sunlight to start the process of photosynthesis.
3. Are these two processes related?
   Yes. They are opposites of each other.

4. Describe the Carbon Cycle.