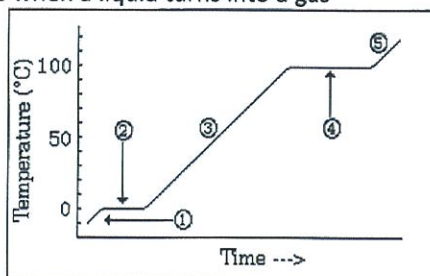


Study Guide

B	M	F
100	0	0

5.5B: Boiling, Melting and Freezing Point of Water (H₂O)

- The **melting AND freezing** point of water are both 0 Celsius
 - Melting is when a solid turns into a liquid
 - Freezing is when a liquid turns into a solid
- The **boiling** point of water is **100 Celsius**.
 - Boiling is when a liquid turns into a gas



- Water is Ice (solid) below 0° C
- Melting and Freezing point 0° C
- Water is liquid
- Boiling Point at 100° C
- Water vapor (gas) above 100° C

5.5C,D: Mixtures and Solutions

- **Mixtures** are when two or more ingredients are combined and all of the ingredients maintain their physical properties.
 - Ex: Salad, Banana split, oil and water, pebbles and sand, sand and water, iron filings and sand
 - You can separate mixtures using magnets (with things containing iron, nickel, cobalt, and steel) sieves/strainers, tongs, hands, filter paper, etc.
- **Solutions** can be when two or more ingredients are combined and one of the ingredients is soluble, or dissolves, in the other to create a new substance. **Physical Properties Change**
 - Ex: lemonade(adding lemon juice to water), drink mix and water, salt and water, sugar and water
 - You can separate a solution by boiling or evaporating the water.

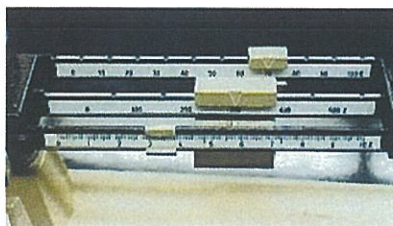
Lab Safety

- Safety Equipment: Apron, Goggles, Gloves
- Lab Safety:
 - If there is ever an accident, tell the teacher immediately
 - Follow all instructions
 - Waft a chemical in order to smell it.

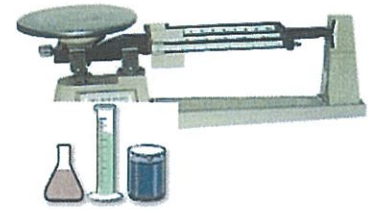


Mass

- Mass is the amount of matter in an object.
- It is measured in grams (g)



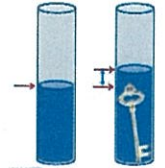
- You use a balance scale to measure mass
- Mass and weight are NOT the same thing
- You can calculate the mass by **adding** the weights.
- **Mass, matter, matter; mass, matter, matter; mass**



- **Volume**
- The amount of space an object takes up.
- You can find the volume of a liquid by using a beaker or graduated cylinder
- It is measured in liters, milliliters (mL)
- You can find the volume of a rectangular prism by using $L \times W \times H$ (cm^3)
- You can use displacement to find the volume of an irregular shaped object by placing the object in a graduated cylinder and measuring how much the water rises.



object by



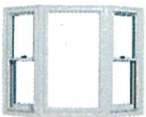
- **Magnetism:** Magnets attract object made of iron, nickel, cobalt, and steel. **MAGNET INCS**
- **Solubility:** If an object is soluble than it means that it can be dissolved.
- **Conductor or Insulator** of thermal energy
 - o Conductors Can let energy go through. Ex: metals; aluminum, gold, copper, brass, steel, iron, nickel
 - o Insulators Stop energy from going through. Ex: plastic, wood, foam, glass, non-metals
 - o CONductor, CAN-ductor, GO GO GO , InSulator Stop!
- **Relative Density**
 - o If an object is more dense (denser) than water than it will sink
 - o If an object is less dense than water than it will float.
 - o More dense sinks, Less dense floats
- **Physical State**
 - o Solid: Definite shape and definite volume (molecules tightly packed) **LAZY**
 - o Liquid: Definite volume but no definite shape
 - o Gas: No definite volume or shape (molecules spread far apart) **MOST ENERGY**

More dense



Less dense

Clarity



- o **Transparent:** Can see through clearly.
- o Ex: Ziploc bag, window, clear glass, lenses

- o **Translucent:** Can partially
- o Ex: clouds, plastic grocery bags



through it.

- o **Opaque:** Cannot see through it
- o Ex: door, wood, metal, floor, ceiling, ball

at all.



Solar System/Planets

- The sun is located in the **center** of our solar system.
- There are **eight planets** in our solar system
- The planets orbit, or revolve, around the sun.
- The **4 planets that are closest to the sun, and inside the asteroid belt, are called inner planets and they are also all terrestrial planets because they all have a rocky surface.**
- The 4 planets that are **farthest from the sun, and outside the asteroid belt, are called outer planets. They are also known as Jovian planets, which mean Jupiter like, because they are all gaseous planets known as gas giants.**
- The planets are **Not** in a straight line, however, many people draw them that way so that they can see the order they are in of their distance from the sun.
- The order of the planets from the planet closest to the sun to the planet farthest away is **Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.**

My Mercury
(Starts with M ends with y)

Very Venus

Educated Earth

Mother Mars

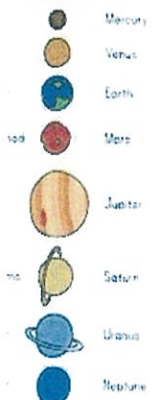
(4 letters= 4th planet)

Just Jupiter

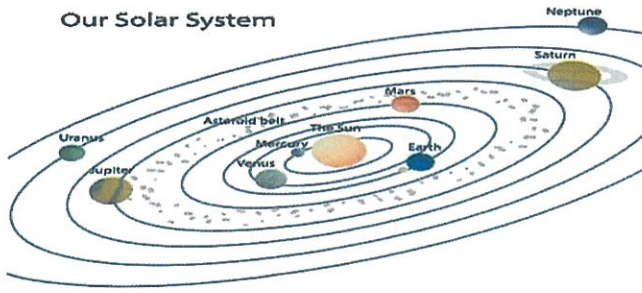
Served Saturn

Us Uranus

Nachos Neptune



Our Solar System



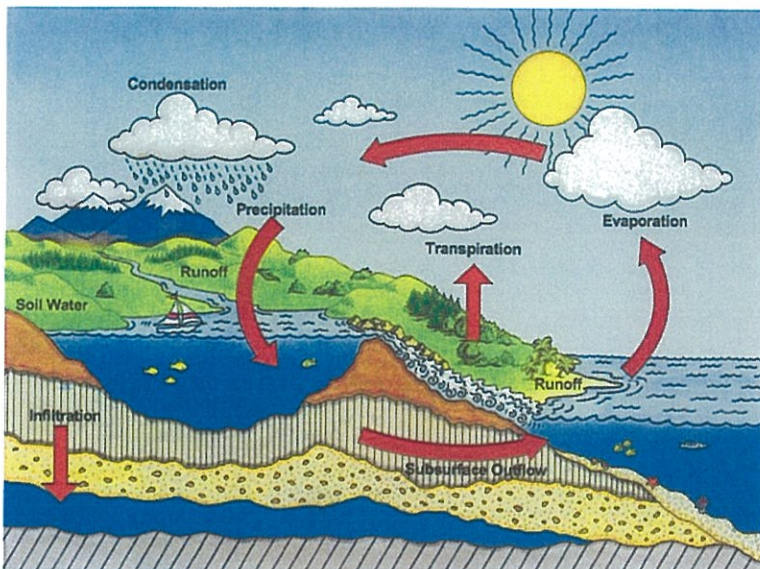
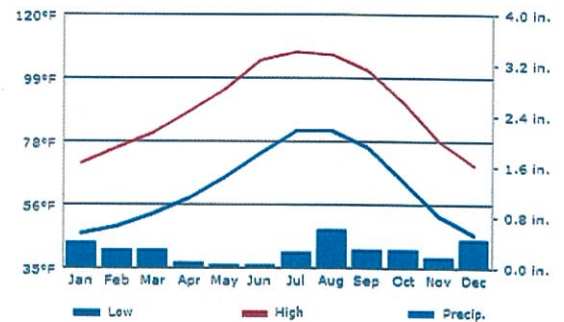
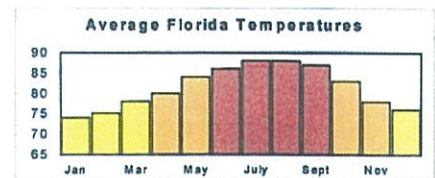
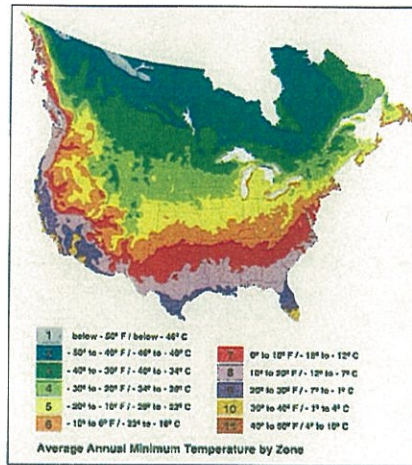
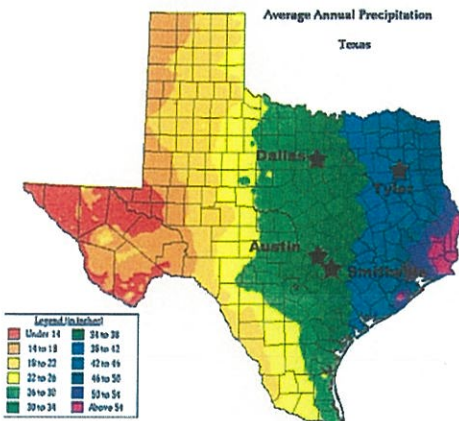
Climate

Climate is the average weather in an area over a long period of time.

	January Average Temp F/C°	August* Average Temp F/C°	January Average Humidity %	August Average Humidity %	Annual Rainfall (in/cm)
Playas Pacificas	70 / 21	83 / 29	55	69	4 / 10
La Paz	68 / 20	93 / 34	70	78	12 / 31
Cabo San Lucas	64 / 18	85 / 29	55	74	10 / 25

This data table is an example of climate because it shows the average weather over a long period of time. It does not show weather on any specific days.

Examples of Climate.....



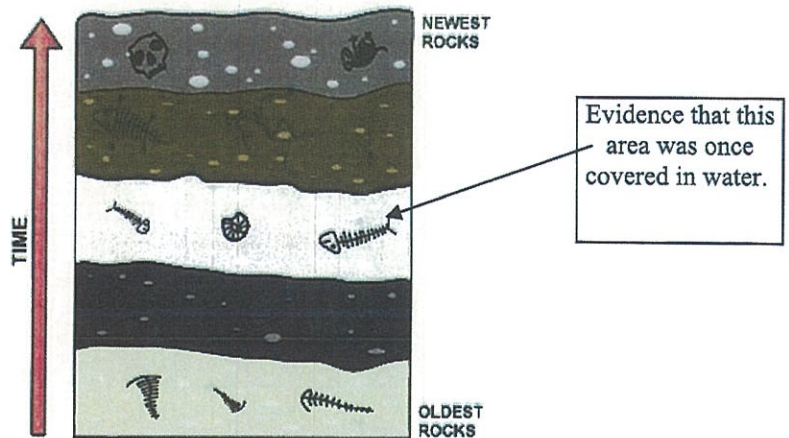
Water Cycle

- The sun is the main source of energy that drives the water cycle.
- The sun heats up the water and causes the liquid water to turn into a gas in the process of evaporation.
- Water can also evaporate from plants or trees in the process called transpiration.
- When the water vapor rises into the air and gets colder it turns back into a liquid and forms clouds. When water vapor (gas) turns back onto a liquid it is called condensation.
- When the water in the clouds gets too heavy, gravity pulls it down in a process called precipitation. It can either be a solid or a liquid in the form of rain, sleet, snow or hail.
- Infiltration is when water goes through the ground and into the groundwater, which is water under the ground.
- Runoff is the water that flows into a larger body of water.
- Accumulation is a collection of water such as a lake, river, or ocean.

Natural Resources Study Guide

Sedimentary Rock and Fossils

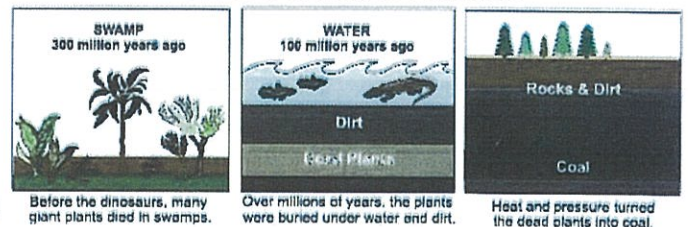
- **Sedimentary rock** is formed when **sediments** (tiny pieces of rock) deposit in layers on top of each other over time. The weight of the layers **compress** (push down) and **compact** (push together) the sediment until it becomes **cemented** (hardened) into rock.
- Most fossils are found in sedimentary rock. **Fossils are evidence of past living organisms.** Fossils give clues about past environments and can show the history of an organism. **Fossils that are found on the bottom layers of sedimentary rock are older than fossils found at the top.**



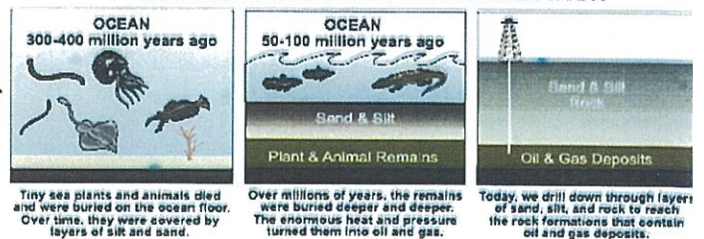
Fossil Fuels

- **Fossil fuels** are the remains of dead plants and animals that died and were buried under sediments millions of years ago.
- Fossil fuels include **coal, oil (petroleum), and natural gas.**
- Fossil fuels are considered **nonrenewable resources.**
- **Coal** is formed by the remains of **swampy plants** as heat and pressure from layers of sediment is exerted on them over millions of years.
- **Oil (petroleum), and natural gas** are formed from the remains of **sea organisms** as heat and pressure from layers of sediment is exerted on them over millions of years.

HOW COAL WAS FORMED



PETROLEUM & NATURAL GAS FORMATION

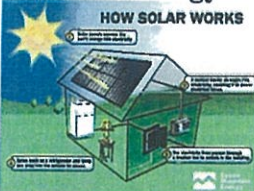

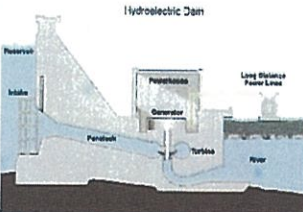
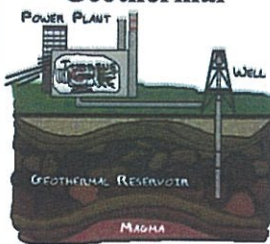



Natural Resources

- **Natural Resources** are resources that come naturally from the earth. They are NOT man-made. For example, paper and plastic are not natural resources because they are man made. However, wood and soil are natural resources because the earth makes them.
- **Renewable resources** are resources that nature produces again and again in a **relatively short period of time.**
 - **Ex: plants, animals, air, water,**
- **Nonrenewable resources** are resources that nature **cannot replace quickly enough** to meet people's needs.
 - **Ex: Fossil Fuels (coal, oil, natural gas), minerals, gold, metals,**

Alternative Energy

- Because fossil fuels are nonrenewable when they are used up, they cannot be replaced. Most of the energy we use comes from fossil fuels. In order to conserve these fossil fuels, or not use them all up, we will need to use alternative sources of energy that use renewable resources that will not run out. The following are various alternative energy resources that can be used....

<p>Solar Energy HOW SOLAR WORKS</p>  <p>Solar Panels collect energy from the sun. Advantages: the sun is renewable (it won't run out); no pollution; cost-free Disadvantages: less sunlight on cloudy days; takes up a lot of space; costly</p>	<p>Wind Energy</p>  <p>Wind turns the turbines Advantages: Renewable; no pollution Disadvantages: wind not always blowing; can be noisy; and may harm birds.</p>	<p>Hydroelectric</p>  <p>"Hydro" means water. Flowing water turns turbines Advantages: renewable, low pollution; reliable, Disadvantages: can destroy habitats (floods); costly</p>	<p>Geothermal</p>  <p>"Geo" means earth and "Thermal" means heat Heat from inside the earth is used to turn turbines. Advantages: renewable; no pollution, Disadvantages: not available in most places; costly</p>	<p>Biofuel</p>  <p>"Bio" means life Biomass= plant and animal material such as wood, waste and leftover crops. Biomass can be burned or turned into oil. Advantages: renewable; can come from the garbage. Disadvantages: air pollution; farmland used for fuel crops rather than food crops; cannot be used in all cars and trucks.</p>
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Conservation, Recycling, Disposal

Conservation is the wise use and protection of natural resources.

The following are a few ways that you can conserve natural resources.

- You can conserve **fossil fuels** by using alternative sources of energy.
- You can conserve **water**, by turning off the water while brushing your teeth or taking quick showers.
- You can conserve **energy**, by turning off lights and electronics while not in use.
- You can conserve **trees** by recycling paper or planting new trees to replace ones that are chopped down.

Proper Disposal: You should not throw away batteries, electronics, or hazardous waste because their toxic compounds are brought to landfills where they can get into soil and pollute water. Instead, they should be brought a proper recycling center.



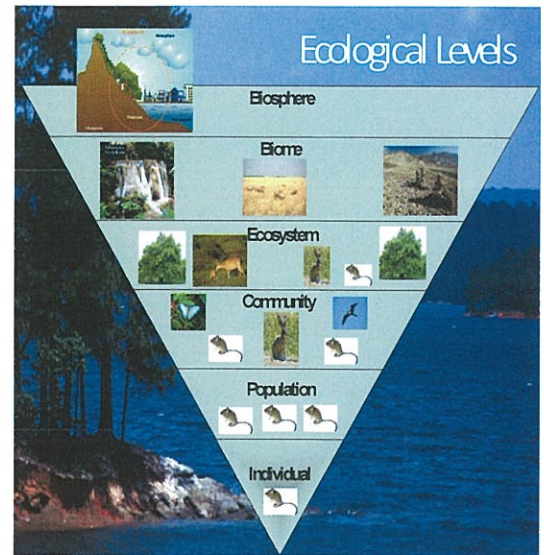
Recycling is use again or to reuse waste material by converting it into something new.

- Paper, plastics, and metals can be recycled instead of thrown away.





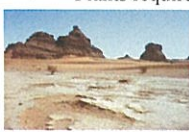





Organisms and Environments Study Guide

Vocabulary

- **Individual:** one organism, by itself.
- **Population:** all the organisms that live in the same place at the same time.
- **Community:** Populations that live in the same place at the same time
- **Ecosystem:** all the living and nonliving elements that interact with each other in an environment.
- **Biome:** a very large area with a certain kind of climate and certain kinds of organisms living there.
- **Biosphere:** the thin, life-bearing, outer layer of the Earth's surface that contains all the biomes.
- **Ecology:** the study of how living and nonliving things interact.
- **Environment:** an organism's surroundings.
- **Habitat:** the environment where an organism lives
- **Organism:** Living things (plants, animals, bacteria, fungi)
- **Niche:** An organism's role or job (Ex: A bee's niche is to make honey or pollinate flowers)
- **Producer:** an organism that makes its own food (plants)
- **Consumer:** organism that eats other things (animals)
- **Primary Consumer:** an animal that eats producers. (Ex: herbivores)
- **Secondary Consumer:** animals that eat primary consumers (Ex: carnivores)
- **Herbivore:** Animals that eat only plants (Ex: rabbits, cows, horses, etc)
- **Carnivore:** Animals that eat only meat or other animals (Ex: sharks, lions, foxes)
- **Omnivore:** Animals that eat both plants and animals (Ex: humans and bears)
- **Grazers:** animals that eat grass (Ex: cows, horses, zebras, etc)
- **Prey :** animals that are being hunted (Ex: rabbits are prey to foxes)
- **Predators:** animals that are hunting prey. (Ex: Sharks are predators of smaller fish)
- **Decomposer:** organism that breaks down dead plant or animal matter. (Ex: fungi, bacteria, mushrooms)
- **Scavenger:** animal that eats dead or decaying matter (Ex: vultures)
- **Perish:** die or suffer complete destruction. (Ex: The rabbit population in the forest perished after the forest fire)
- **Competition:** two or more organisms competing (fighting) against each other (Ex: grass and trees compete for sunlight; cows and horses compete for grass)
- **System:** a group of parts that work together to perform a common function
- **Relationship:** a connection between two or more organisms and their involvement with one another.



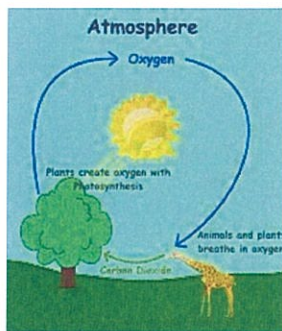
Types of Biomes

<p style="text-align: center;">Deciduous Forest</p> <ul style="list-style-type: none"> • Cold winters; warm, wet summers • Broadleaf trees like maple and oak • Trees lose their leaves in the fall • Deer, raccoons, small birds • Many animals have small bodies so they can move easily through the brush • Brown soil <div style="display: flex; justify-content: space-around;">   </div>	<p style="text-align: center;">Tropical Rainforest</p> <ul style="list-style-type: none"> • Heavy rainfall • Climbing vines • Colorful birds, monkeys, snakes • Tree frogs have long toes with sticky tips to help them climb wet trees • Near equator • Ferns and palms <div style="display: flex; justify-content: space-around;">   </div>	<p style="text-align: center;">Desert</p> <ul style="list-style-type: none"> • Extremely dry • Sparse grasses • Cactus • Plants store water in thick leaves. • Reptiles have tough, scaly skin that prevents water loss. • Plants require little water. <div style="display: flex; justify-content: space-around;">   </div>
<p style="text-align: center;">Taiga</p> <ul style="list-style-type: none"> • Cold winters; short growing season • Evergreen trees • Bears, moose, ducks • A waxy covering protects tree needles from the cold and limits water loss. • Rains in the summer • Acidic soil <div style="display: flex; justify-content: space-around;">   </div>	<p style="text-align: center;">Tundra</p> <ul style="list-style-type: none"> • Extremely cold, dry • Arctic foxes, polar bears, migratory birds • Low shrubs, lichens, no trees Arctic foxes and other animals grow thick white coats to blend into the snowy landscape. • Means "marshy" <div style="text-align: center;">  </div>	<p style="text-align: center;">Grassland</p> <ul style="list-style-type: none"> • Temperate climate • Grasses, both annual and perennial • Antelope, bison, elephants, prairie dogs and jack rabbits • Roots grow just below the surface of the soil and spread out to take in as much rain as possible. <div style="text-align: center;">  </div>

Changes in Ecosystems

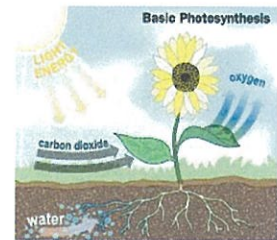
There are many things that can cause changes in ecosystems. Often these changes are caused by humans. Such changes may include the building of highways, prevention of wild fires, pollution, and building of various manmade structures.

- **If an animal's population decreases** then the population of that animal's predators will also decrease because they will not have enough food. However, the population of what that animal eats will increase because there will not be as many animals eating it.
- **If an animal's population increases** then the population of the predators of that organism will also increase because they will have more food to eat. However, the population of the food that the animals consumes will decrease because there will be more animals eating it.
- **If the population of a producer increases** then the population the primary consumers that eat them will increase as well because there will be plenty of food, and the population of secondary consumers that eat those primary consumers will also increase because they will be more primary consumers for them to eat.
- **If the population of a producer decreases** then the population of their consumers will also decrease because they will not have enough food, and the secondary consumers that eat those primary consumers will also decrease.



Carbon Dioxide/ Oxygen Cycle

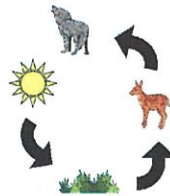
- Plants and animals depend on each other for survival. **Plants release oxygen** which animals need to survive, and **animals exhale carbon dioxide** which plants need during the process of photosynthesis to create their own food.
- The burning of fossil fuels and other wastes also expels carbon dioxide in the air. (Ex: factory pollution)



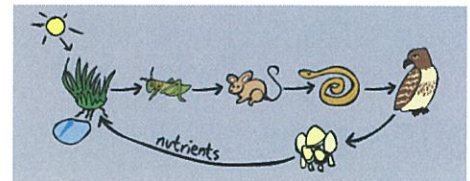
Plants use water, sunlight and carbon dioxide during photosynthesis to create their own food. (They take in carbon dioxide and release oxygen.)

Food Chains/Food Webs

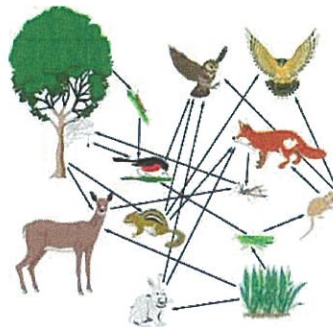
- **All food chains and food webs begin with energy from the sun.** Producers use the sun's energy in the process of photosynthesis.
- **The arrows represent the direction of the flow of energy.** They always point to what is eating them. Because producers get their energy from the sun, then the arrow will point from the sun to the producer because the energy is flowing from the sun to the producer.
- Once the primary consumer or herbivore eats the producer, then the energy from the producer is then transferred to the primary consumer. The arrow will be pointed from the producer to the primary consumer.
- When the primary consumer eats the secondary consumer, the energy from the secondary consumer is then transferred to the primary consumer. Therefore, the arrow will be pointing from the primary consumer to the secondary consumer because the energy flows from the primary to the secondary consumer.
- Decomposers can break down the dead plants and animals and can be found at any part of the food chain or food web.



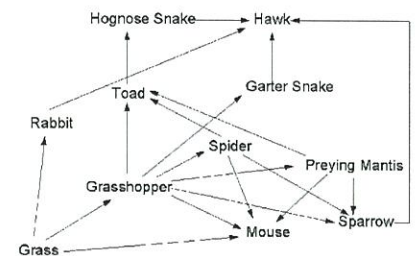
From the food chain above you can see that the energy originates from the sun.



In the food chain above you can see that decomposers break down the dead hawk causing the soil to receive more nutrients which help producers grow.



By looking at a food web, you can determine which animals eat what and which animals compete for the same foods. Remember that all food webs and food chains start with energy from the



From the food web above, you can determine that mice, grasshoppers, and rabbits all compete for grass. Spiders, toads, and garter snakes and mice all compete for grasshoppers. Hawks eat hognose snakes, garter snakes, rabbits and sparrows. Hawks are at the top of this food web because nothing eats them.