Conductors

* Materials that ALLOW heat to pass/move through easily.

Good Conductors

- metal
- aluminum
- copper
- steel
- water
- iron

Insulators

* Materials that DO NOT allow heat to pass/move through easily.

Poor Conductors

- plastic
- rubber
- wood
- styrofoam
- wool
- ceramic
- glass
- air

States of Matter

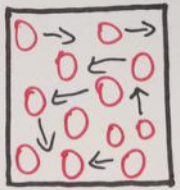
* ALL matter has mass + takes up space!!!

Solids

* Definite Volume
* Definite Shape
* Molecules are tightly packed + don't move much at all.

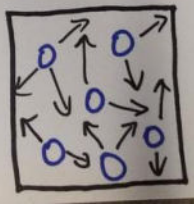
Liquids

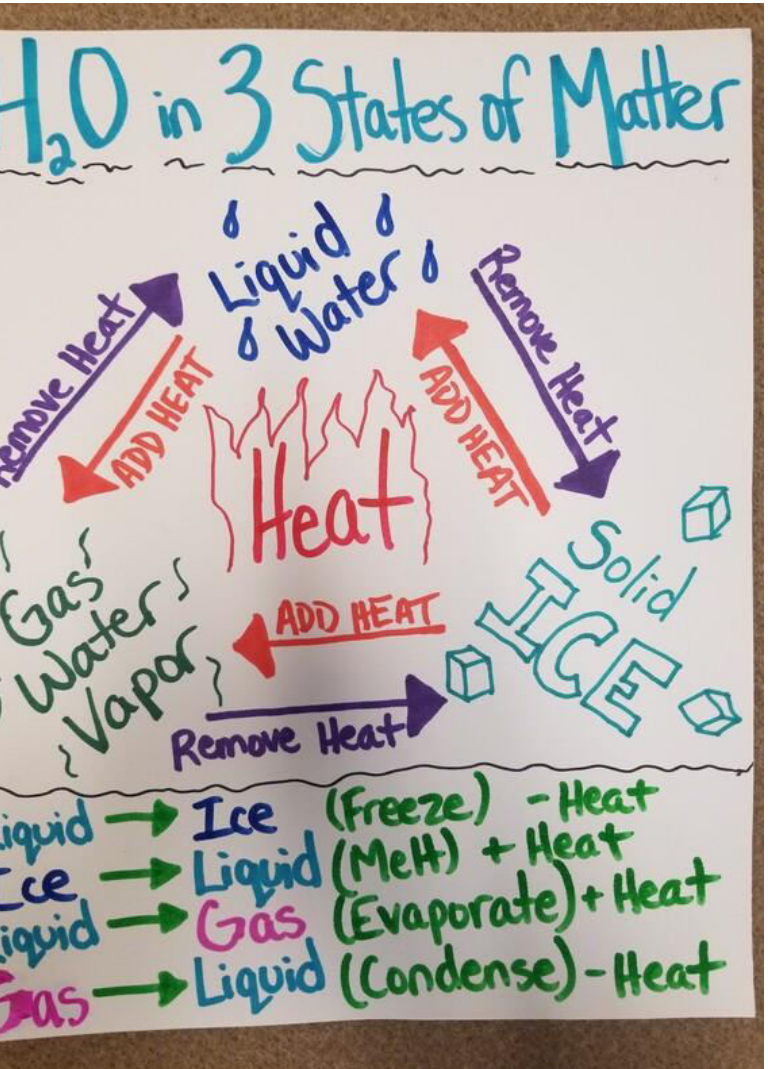
* Definite Volume
* No Definite Shape (takes shape of it's container).
* Molecules are loosely packed + can move a little.

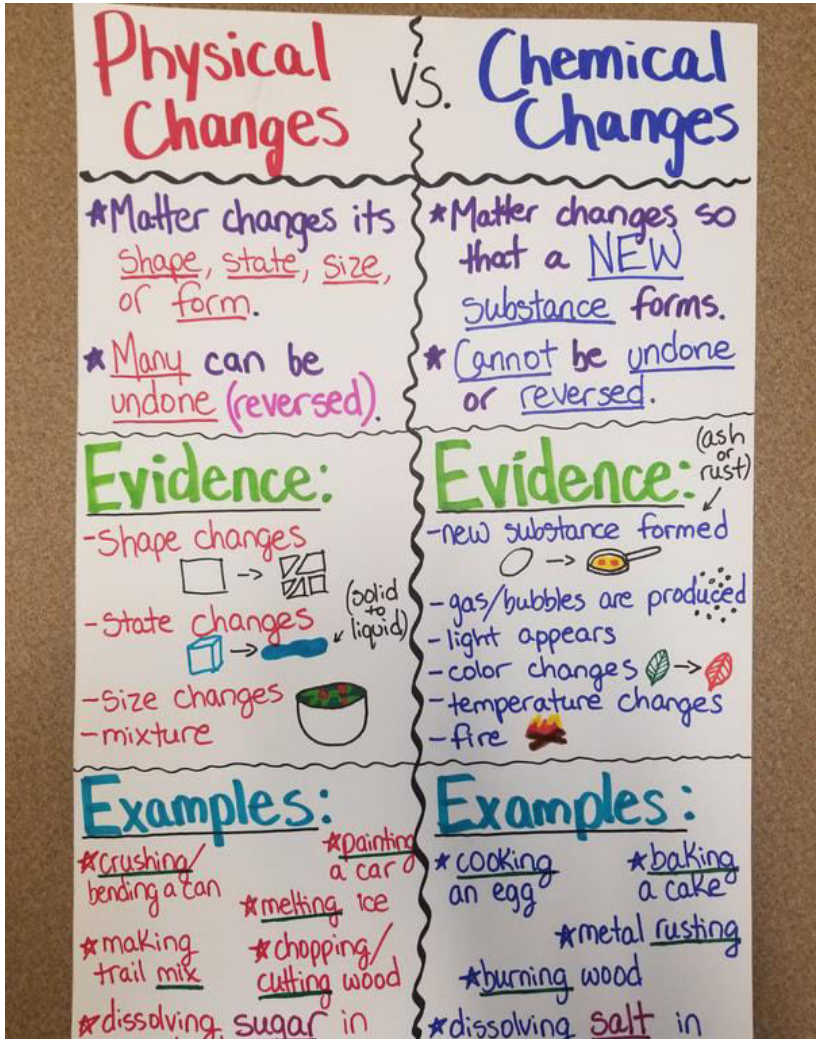


Gas

* No Definite Volume
* No Definite Shape
* Molecules are very loosely packed + can move around all over the place.




H_2O in 3 States of Matter
Liquid Water
Heat
Remove Heat
ADD HEAT
ADD HEAT
Remove Heat
Gas Water Vapor
ADD HEAT
Remove Heat
Solid ICE
Liquid → Ice (Freeze) - Heat
Ice → Liquid (MeH) + Heat
Liquid → Gas (Evaporate) + Heat
Gas → Liquid (Condense) - Heat


Physical Changes VS. Chemical Changes
*Matter changes its Shape, state, size, or form.
*Many can be undone (reversed).
*Matter changes so that a NEW substance forms.
*Cannot be undone or reversed.
Evidence:
-Shape changes
-State changes
(solid to liquid)
-Size changes
-mixture
Evidence:
(ash or rust)
-new substance formed
-gas/bubbles are produced
-light appears
-color changes
-temperature changes
-fire
Examples:
*crushing/bending a can
*painting a car
*melting ice
*making trail mix
*chopping/cutting wood
*dissolving sugar in
Examples:
*cooking an egg
*baking a cake
*metal rusting
*burning wood
*dissolving salt in

USING THE

SCIENTIFIC METHOD

1 QUESTION

Ask yourself, "What do I want to learn more about?", or "I wonder what would happen if . . . ?"

2 HYPOTHESIZE

Research to help you make an educated guess, or hypothesis, and then answer your question.

3 EXPERIMENT

Test your hypothesis by making a plan and conducting an experiment.

4 OBSERVE & RECORD

Make careful observations and write down what happens.

5 ANALYZE

Use your information to draw conclusions about your experiment. Was your hypothesis correct?

6 SHARE RESULTS

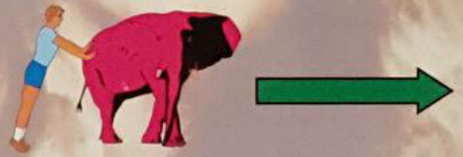
Explain your results by presenting your experiment, observations, and conclusions.

Newton's Laws

1st Law: An object in motion will remain in motion unless acted upon by an outside force.
An object at rest will remain at rest unless acted upon by an outside force.

2nd Law: F=ma

Force = Mass x Acceleration



3rd Law: For every action, there is an equal and opposite reaction.

Human Body Systems

Digestive

Digestive System

- ★Breaks down food to turn into energy for the body.
- ★Gives nutrients to the body.
- ★Eliminates waste.

Respiratory

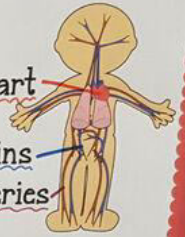
Respiratory System

- ★Movement of air in + out of the lungs.
- ★Intake of oxygen + removal of carbon dioxide (waste) from the body.

Circulatory System

- ★Transports blood, oxygen, + nutrients throughout the body by the heart pumping.
- ★Helps remove waste.

Circulatory



Skeletal System

- ★Support/Structure for the body.
- ★Protects Organs.
- ★Allows the body to Move.

Muscular

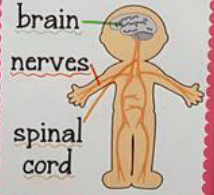
Muscular System

- ★Involuntary + Voluntary body movements (move bones, organs, + the heart).
- ★Skeletal (bones), Cardiac (heart), + smooth (digestion).

Nervous System

- ★Control + Communication network of the body.
- ★Sends messages to + from the brain to control reactions to stimuli + body functions.

Nervous



Skeletal

Genetics

Inherited Traits: characteristics passed from parent to offspring (born with it) - eye color.

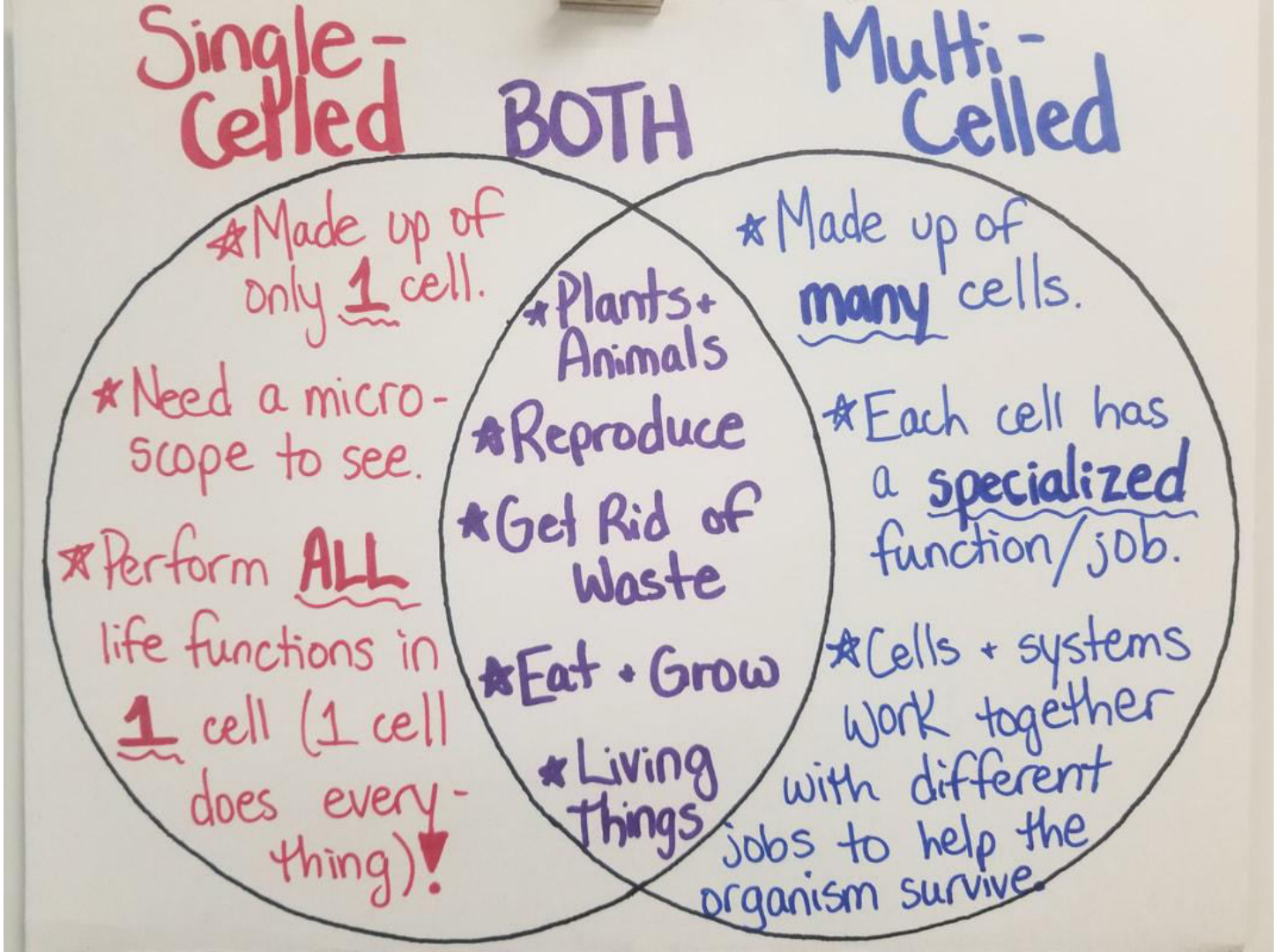
Acquired Traits: characteristics that develop during your lifetime (NOT born with) - a scar.

Learned Behaviors: a skill that someone develops/learns during their lifetime - ride a bike.

Instinct: inherited behaviors an organism is born knowing how to do - birds migrating.

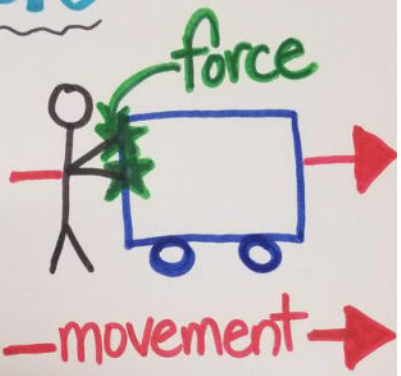
Systems Working Together!

Skeletal + Muscular	muscles pull bones to move + help you stand up straight.
Circulatory + Respiratory	takes in oxygen + delivers oxygen-rich blood to the body (removes carbon dioxide as waste)
Circulatory + Digestive	breaks down food + delivers nutrients throughout the body.
Circulatory + Muscular	cardiac muscle that pumps the heart.
Nervous + Muscular	recieves messages from the body to control muscle movement
Muscular + Respiratory	takes in oxygen to keep the body/muscles moving (more excercise = more breathing).

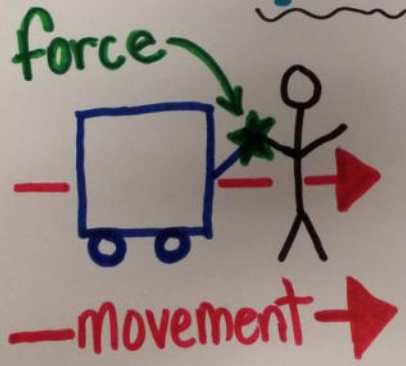

Single-Celled
BOTH
Multi-Celled
*Made up of only 1 cell.
*Need a micro-scope to see.
*Perform ALL life functions in 1 cell (1 cell does every-thing)!
*Plants + Animals
*Reproduce
*Get Rid of Waste
*Eat + Grow
*Living Things
*Made up of many cells.
*Each cell has a specialized function/job.
*Cells + systems work together with different jobs to help the organism survive.

Push

*A force to move something away.



Pull



*A force to move something toward.

Gravity

*A force that attracts/pulls 2 objects toward each other.

*More Mass = More Gravity

*More Distance = Less Gravity

Friction

Motion

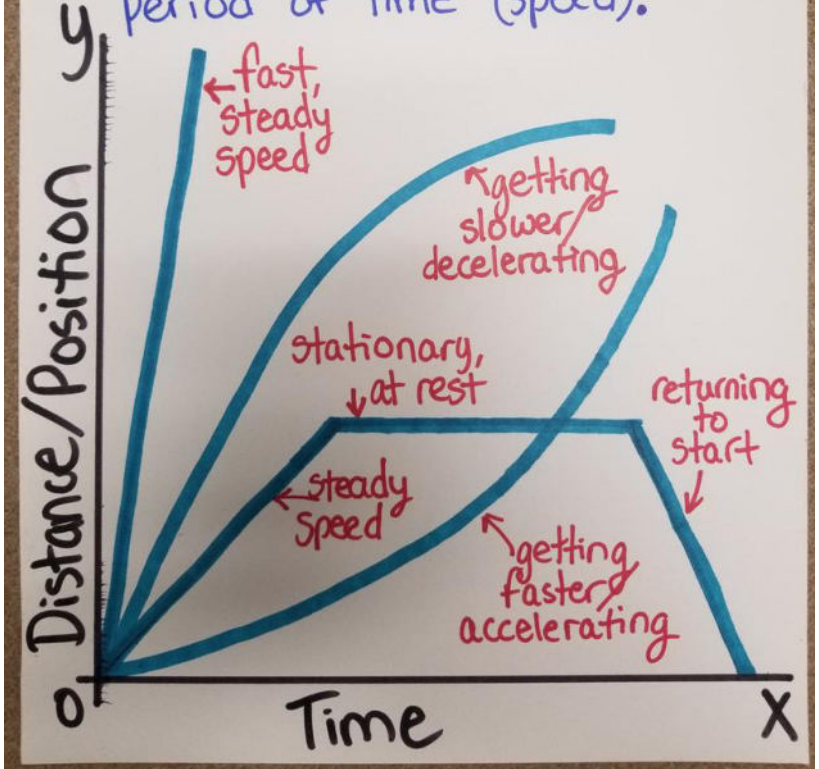
Friction

*Air resistance is friction in the air!

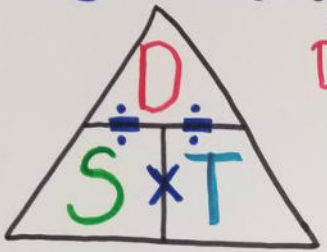
*A force that works against motion to slow it down.

Distance-Time Graph

★shows a change in position over a period of time (speed).



Calculating Speed



D = Distance
S = Speed
T = Time

A car traveled 300 miles in 5 hours. How fast was it going?

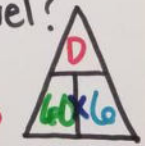
Speed = Distance / Time

$5\overline{)300}$ → 60 mph

A bus traveled for 6 hours at a speed of 60 mph. How far did it travel?

Distance = Speed x Time

60 x 6 = 360 miles



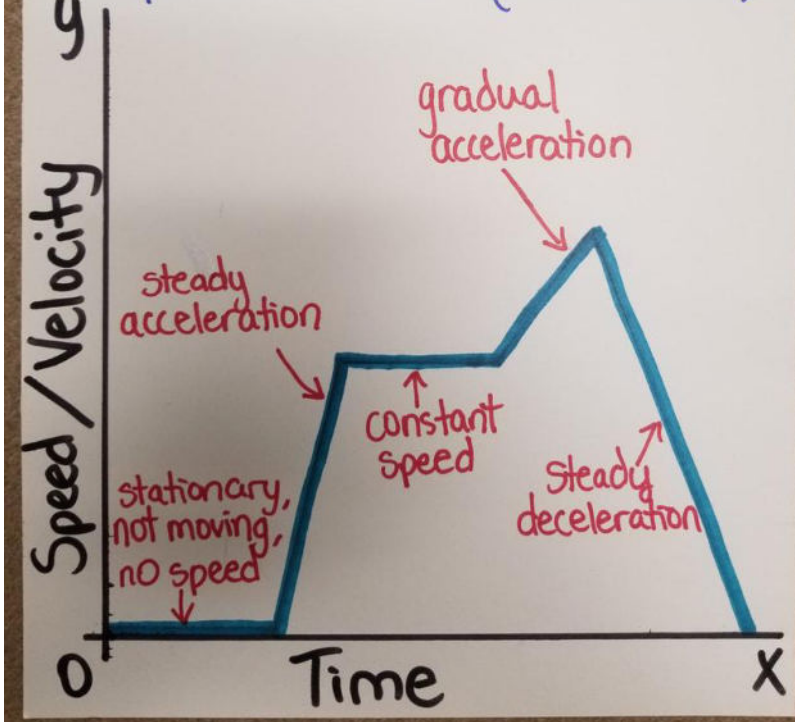
How long would it take to travel 36 miles at 9 mph?

Time = Distance / Speed

$9\overline{)36}$ → 4 hours

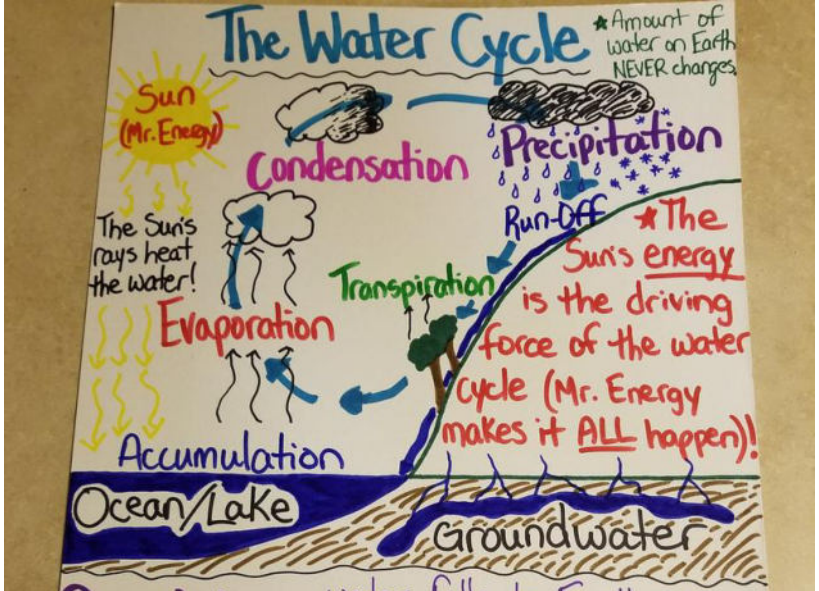
Speed-Time Graph

★shows a change in speed over a period of time (acceleration).



The Water Cycle

★Amount of water on Earth NEVER changes.



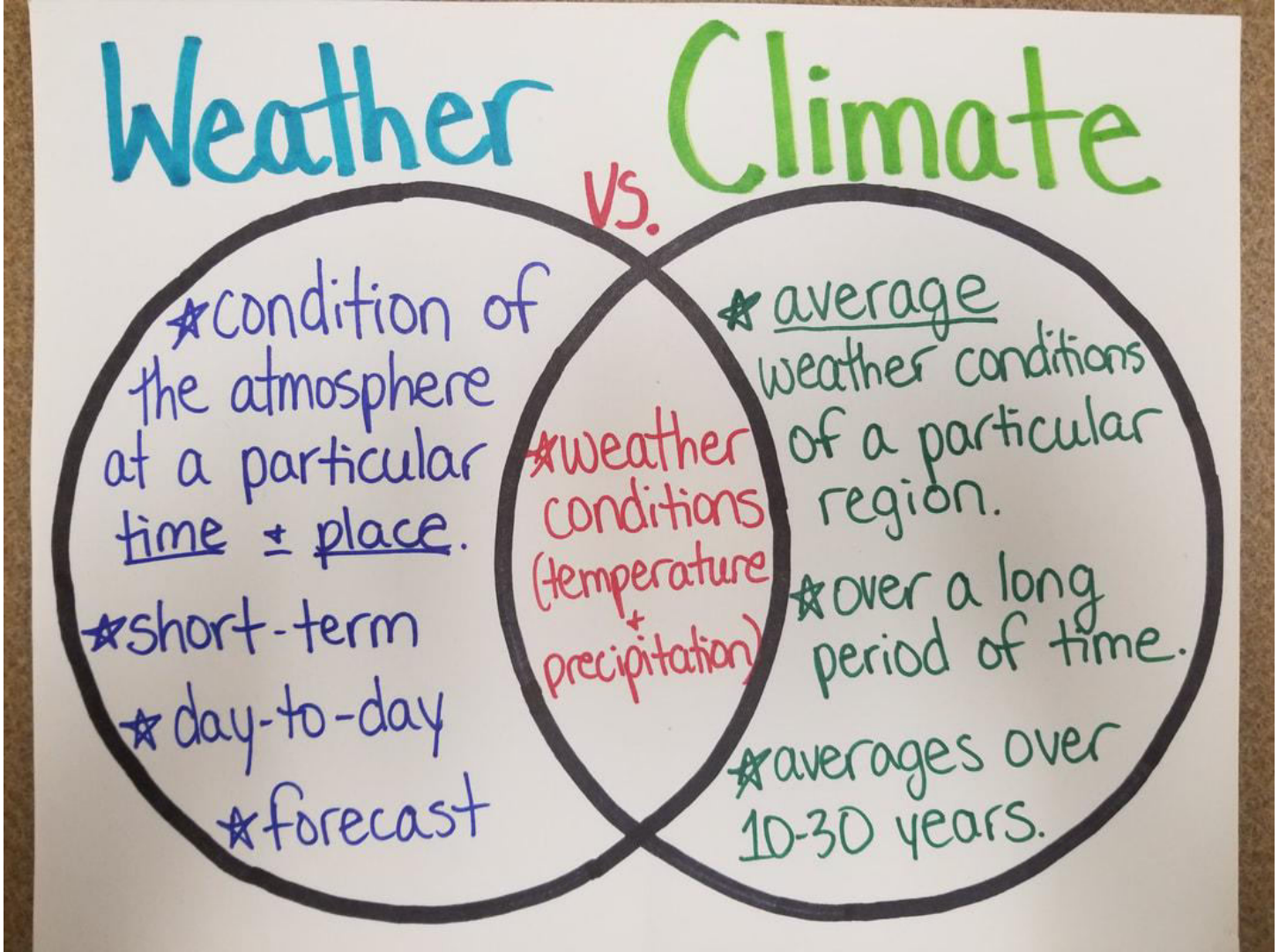
Precipitation: water falls to Earth as rain, sleet, hail, snow, or ice.

Accumulation: run-off + collection of water on Earth (oceans, lakes, etc.)

Evaporation: water changes from a liquid to a gas as it heats up from the Sun.

Transpiration: evaporation from plants.

Condensation: water vapor changes from a gas to a liquid as it cools - clouds form.


Weather
VS.
Climate
★condition of the atmosphere at a particular time + place.
★short-term
★day-to-day
★forecast
★weather conditions (temperature + precipitation)
★average weather conditions of a particular region.
★over a long period of time.
★averages over 10-30 years.

Weather Conditions

Temperature: how hot or cold the air is. (thermometer)

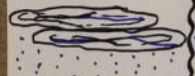
Precipitation: forms of water falling from the sky. (rain gauge)

Humidity: the amount of moisture or water vapor in the air. (hygrometer)

Air Pressure: the force of air pushing on anything. (barometer)

Wind: moving air.
- **Speed**: how fast the wind is going. (anemometer)
- **Direction**: direction wind is blowing from. (wind vane)

Clouds

 Cirrus	★High in the sky ★Thin + Whispy ★Ice Crystals	★Fair weather ★Rain coming in 1-2 days
 Stratus	★Low in the sky ★Stretched out, layered, blanket the sky	★cloudy ★Drizzle, mist, or light rain ★Fog on the ground
 Cumulus	★Puffy + white (like cotton balls) ★Change shapes	★Fair weather ★Can turn into cumulonimbus
 Cumulonimbus	★Dark, tall, + towering ★Extend high in the sky	★Heavy rain/ thunderstorms ★Rain + lightning
 Nimbostratus	★Low in the sky ★Flat, layered, blanket the sky ★Gray	★Steady precipitation (lasts a while) ★Dark stratus

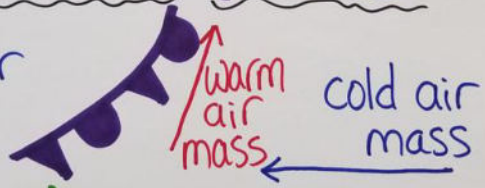
Stationary Fronts

AT Front: rainy, dreary, steady rain for days until the front moves.

Clouds: Nimbostratus

*Similar to a WARM front.

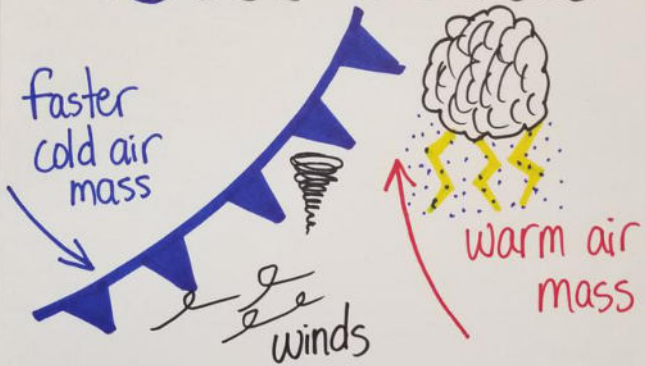
Occluded Fronts



AT Front: severe weather, bad storms, gusty winds, tornadoes.

*Similar to a COLD front, but worse.

Cold Fronts

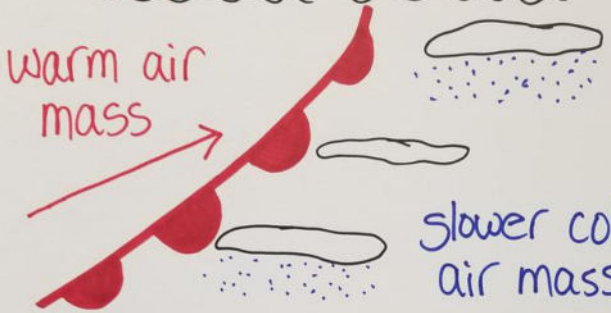


AT Front: brief thunder-storms, heavy rain, strong winds.

Clouds: cumulus + cumulonimbus.

AFTER Front: cool, dry air, clear skies, + fair weather.

Warm Fronts



AT Front: light drizzle, constant/steady showers.

Clouds: stratus, fog, + nimbostratus.

AFTER Front: warm, humid/wet air, + overcast/cloudy.

Air Pressure

High Pressure System

Happy Highs!

↓ altitude
↓ temperature
↓ humidity

★ Drier + cooler weather

★ Sunny, clear skies

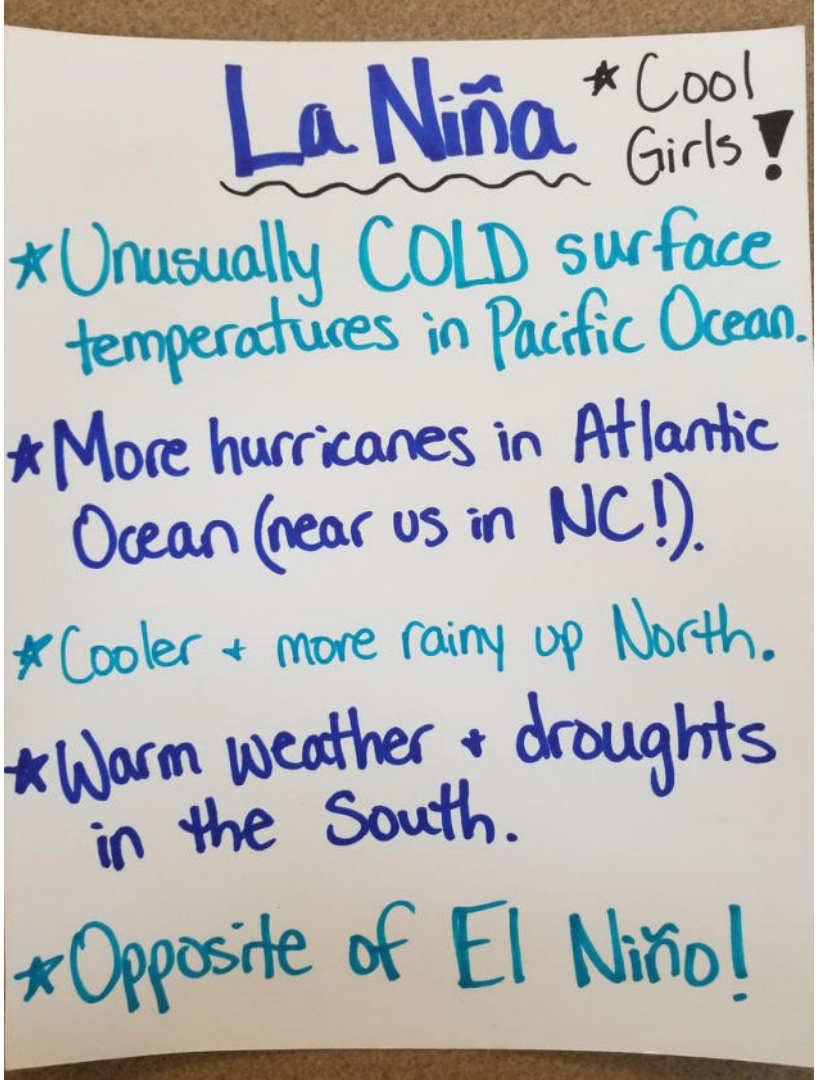
Low Pressure System

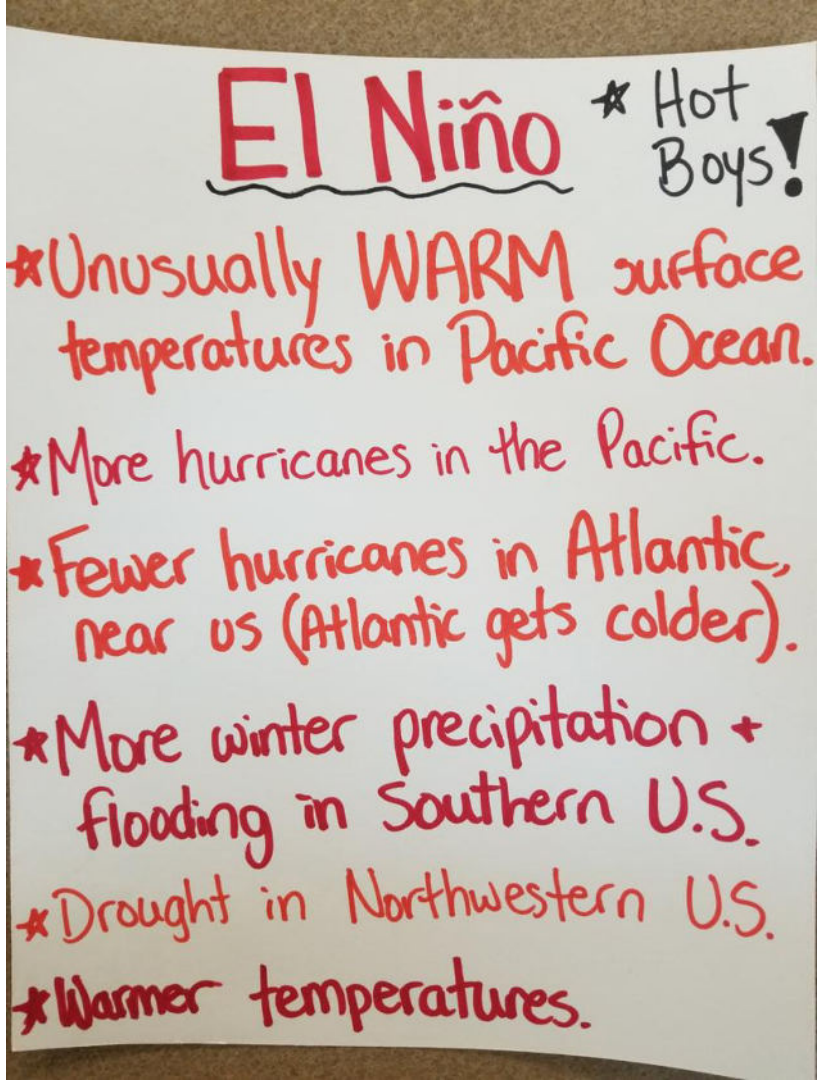
Lowsy Lows!

↑ altitude
↑ temperature
↑ humidity

★ Wetter + warmer weather

★ stormy weather


La Niña
* Cool Girls!
*Unusually COLD surface temperatures in Pacific Ocean.
*More hurricanes in Atlantic Ocean (near us in NC!).
*Cooler + more rainy up North.
*Warm weather + droughts in the South.
*Opposite of El Niño!


El Niño
* Hot Boys!
*Unusually WARM surface temperatures in Pacific Ocean.
*More hurricanes in the Pacific.
*Fewer hurricanes in Atlantic, near us (Atlantic gets colder).
*More winter precipitation + flooding in Southern U.S.
*Drought in Northwestern U.S.
*Warmer temperatures.

Storms

Tornadoes:

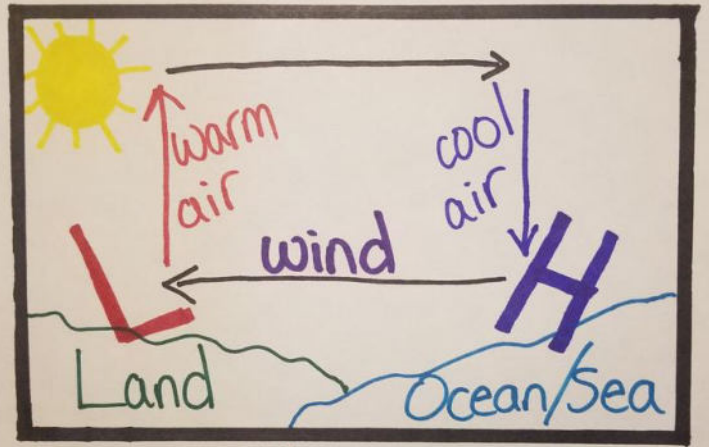
- brings severe weather
- strong winds (100-300 mph)
- FORM ON LAND!

Hurricanes:

- FORM OVER WARM OCEAN WATER!
- bring storm surges + floods
- LOSE STRENGTH + SPEED when they HIT LAND!

No more warm water to strengthen them!

Sea Breeze



★Day-time!

★Land is warmer than the sea!

★Starts above sea.

★Wind moves High→Low!

Land Breeze

★Night-time!

★Sea is warmer than the land!

★Starts above land.

★Wind moves High→Low!

Global Winds

Prevailing Westerlies:

- West → East
  WEEE!
- Primary wind that affects the U.S.!
- Moves weather patterns across the U.S.!

Jet Stream:

- boundary between hot + cold air!!
- West → East
  WEEE!
- Moves weather patterns across globe
- Brings cold weather South when it dips down!

Ecosystems

★All of the living + nonliving things in an area.

Biotic

★Living things!

They can:
- move
- grow
- reproduce
- eat/drink
- empty waste

★Needs (must have to survive):
- food
- sunlight
- water
- air
- shelter

Abiotic

★Nonliving things:
- soil
- water
- air
- rocks
- Sun
- cars
- homes

Ecosystem

★living + nonliving things (biotic + abiotic)

Community

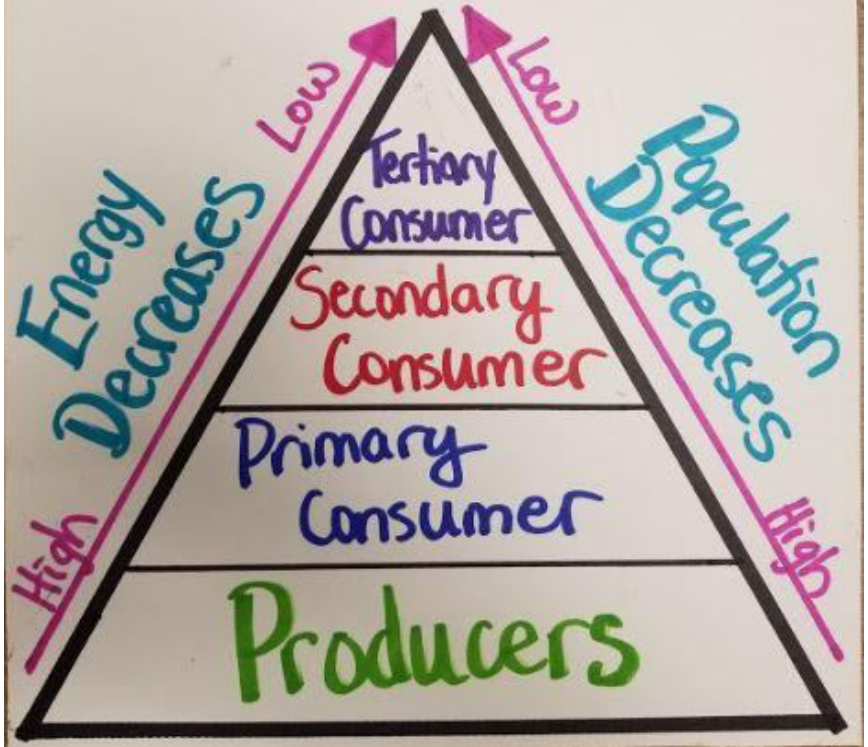
★All the living things (different populations together)

Population

★All of 1 type of organism

Energy Pyramids

★How ENERGY moves through an ecosystem.



Interactions in Ecosystems

Mutualism-

Commensalism-

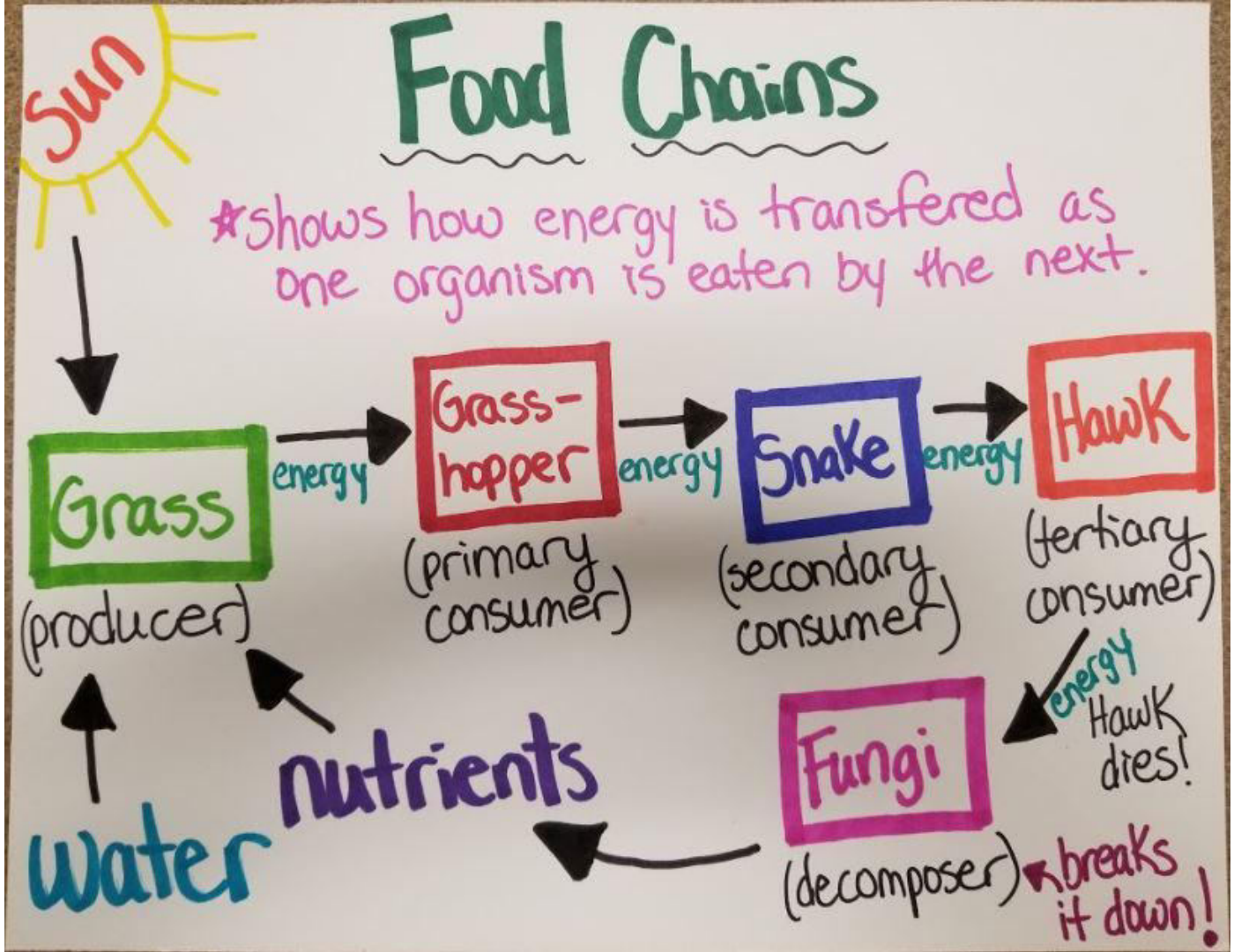
Parasitism-

Producer- makes its own food

Consumer- eats food

- Herbivore- eats only plants
- Omnivore- eats plants + animals
- Carnivore- eats only animals

Decomposer- breaks down waste


Sun
Food Chains
*shows how energy is transfered as one organism is eaten by the next.
Grass
(producer)
energy
Grass-hopper
(primary consumer)
energy
Snake
(secondary consumer)
energy
Hawk
(tertiary consumer)
energy
Hawk dies!
Fungi
(decomposer)
*breaks it down!
nutrients
Water