Name: _____ Period: _____

Reporting Category 1: Matter and Energy

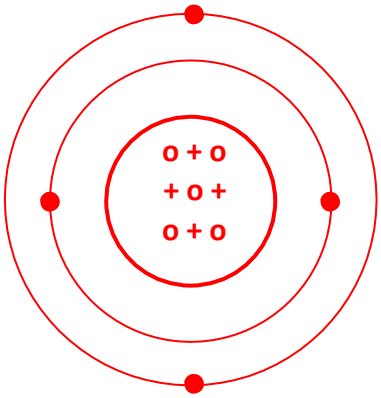
Atoms

Fill in the missing information to summarize what you know about atomic structure.

Name of Subatomic Particle	Location within the Atom	Electrical Charge	Relative Mass
	inside the nucleus	**positive**	1 amu
neutron	**inside the nucleus**	neutral	**1 amu**
electron	**outside the nucleus**	**negative**	1/1836 amu

Bohr Model –

Draw an atom that has four protons, five neutrons, and four electrons. Complete the key to identify the three major subatomic particles.



KEY

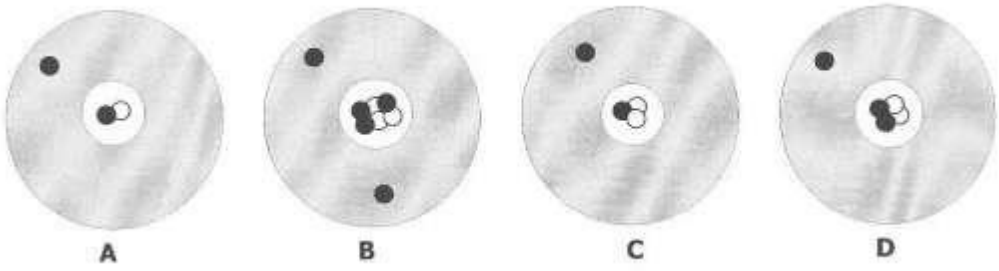
\+ Protons

o Neutrons

● Electrons

What determines the identity of an element? **# of protons**

The diagram below shows models of four different atoms. Use the models to answer the following questions:



Which atom has the greatest mass? **B**

Which atom(s) have a neutral electrical charge? **A and C**

Which atom(s) have a positive electrical charge? **B and D**

Which atom(s) have a negative electrical charge? **none**

Periodic Table

Atomic number = **# of protons and # of electrons** **A = P = E**

Atomic Mass = **# of protons plus # of neutrons** **M – A = N**

*** Electrons are not included in the atomic mass

	Metals	Non-Metals	Metalloids
Where located	**left of stair step**	**right of stair step**	**along stair step**
Luster	**shiny**	**dull**	**shiny to dull**
Conductivity	**good**	**poor**	**some good, some poor**
Malleability	**yes**	**no - brittle**	**some yes, some no**
Most Reactive found where	**far left (Group 1)**	**far right (Group 17)**	**depends**

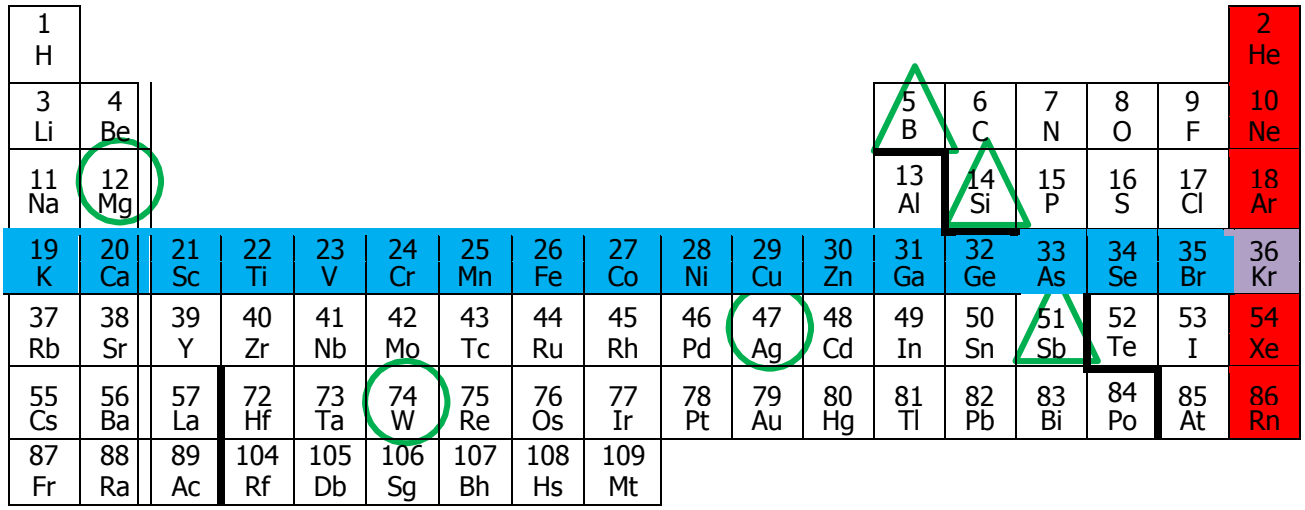
Group 18 – Noble Gases – unreactive (inert) – full set of valence electrons

Period – **horizontal rows (↔) – different properties – same # energy levels**

Family/group # – **vertical columns (↕) – same properties – same # valence electrons**

On the Periodic Table below:

Shade in the group of elements that are called the Noble Gases red.
Shade all of the elements in Period 4 blue.
Circle three elements that are classified as metals.
Draw triangles around three elements that are classified as metalloids.



How many groups or families of elements are on the table? **18**

How many periods of elements are on the table? **7**

Valence Electrons – **outermost electrons, determine chemical properties and reactivity**

Elements have similar properties because? **They have the same # of valence electrons**

Reactivity – **how easily elements combine to form compounds; elements with 1 or 7 valence electrons are the most reactive**

Molecule – **2 or more atoms combined**

Compound – **2 or more different elements combined**

Physical Change – **change in appearance without a change in properties**

Chemical Change – **change in properties – new substance formed**

Chemical Reaction – **same as chemical change**

Evidence of Chemical Reaction – **unexpected color change, precipitate forms, gas production (bubbles, fizzes), change in temperature, change in odor, change in properties**

Chemical Equation – **combination of symbols and formulas that describe a chemical reaction**

What does a coefficient tell you? **# of molecules**

What does a subscript tell you? **# of atoms**

Are they balanced?

$C + H_2O \rightarrow C_6H_{12}O_6$ **No**

E	R	P
C	**1**	**6**
H	**2**	**12**
O	**1**	**6**

$2\ Ag + H_2S \rightarrow Ag_2S + H_2$ **Yes**

E	R	P
Ag	**2**	**2**
H	**2**	**2**
S	**1**	**1**

Conservation of mass – **# atoms in reactants = # atoms in products**
mass of reactants = mass of products

How can we show conservation of mass?
balanced equation

Fill in the missing information to complete the chart.

Substance	Check One: Chemical Symbol	Check One: Chemical Formula	Check One: Element	Check One: Compound	# of Elements	# of Atoms	# of Molecules
H_2O		X		X	2	3	1
O_3		X	X		1	3	1
$CaCO_3$		X		X	3	5	1
He	X		X		1	1	0
Ag	X		X		1	1	0
2 CO		X		X	2	4	2

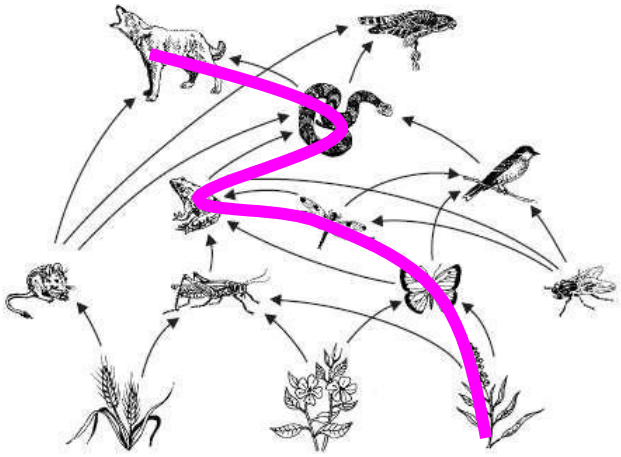
Organic Compounds – contain **carbon** and other elements such as hydrogen, oxygen, phosphorus, nitrogen, or sulfur

Substance	Formula	Organic	Inorganic
sugar	$C_6H_{12}O_6$	X	
salt	NaCl		X
methane	CH_4	X	
water	H_2O		X

Digestion

Structure	Physical	Chemical
Mouth	X	X
Esophagus	X	X
Stomach	X	X
Small Intestine		X

Energy Flow through Living Systems



Highlight one complete food chain on the food web.

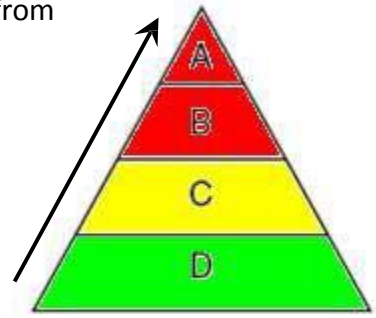
What organisms on the food web have the most available energy?

plants / producers

What organisms on the food web have the least available energy?

coyote & hawk

Draw arrows on the energy pyramid to show the direction of energy flow from greatest to least.

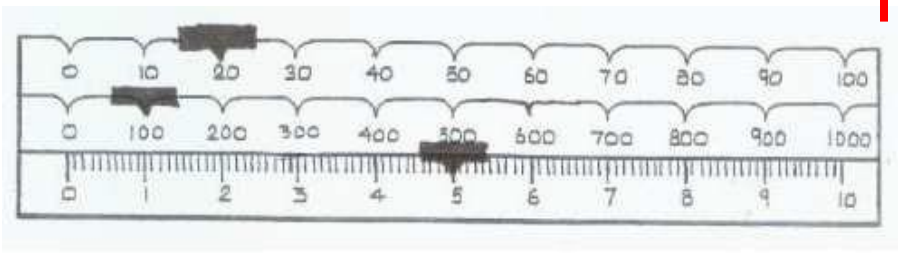


Color producers green, herbivores yellow, and carnivores red.

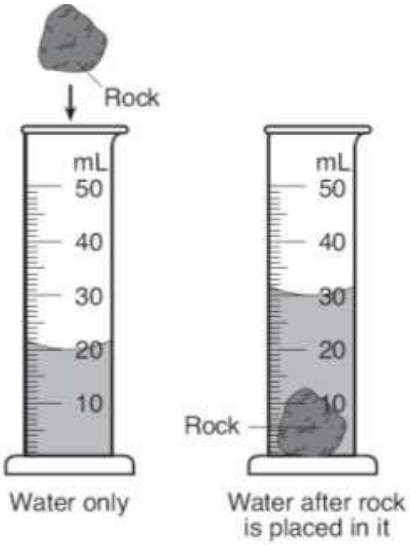
Density = **mass** ÷ **volume**

Use the pictures of the triple beam balance and graduated cylinder to find the density of the rock.

Density = 12.5 g/mL



12.5
10 | 125.0
10
25
20
50
50
0



1. Which two elements are most similar?

   A. Fe and Co
   B. Li and F
   C. Cu and Ag
   D. H and O

2. What are metalloids?

   A. The metal elements with small atomic numbers
   B. The elements between metals and nonmetals on the periodic table
   C. Chunks of metal ore
   D. Nonreactive metal elements

3. Which of the following elements is a liquid at room temperature?

   A. N
   B. B
   C. Br
   D. Si

4. Which of the following elements is the least reactive metal?

   A. K
   B. Ca
   C. Mn
   D. Zn

5. Which of the following is a noble gas?

   A. Ne
   B. N
   C. O
   D. H

6. Which of the following is the better conductor?

   A. Ge
   B. S
   C. Au
   D. C

7. What elements are contained in the compound LiBr?

   A. Lithium, Iodine, and Boron
   B. Lithium and Bromine
   C. Lithium and Boron
   D. It is a compound, so it does not contain elements.

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$$

8. During cell respiration, sugar ($C_6H_{12}O_6$) reacts to form carbon dioxide (CO_2) and water (H_2O). Which of the following best explains what happens during cell respiration?

   A. Single atoms are formed into different elements.
   B. Atoms are rearranged into different compounds.
   C. A molecule is broken down into its pure elements.
   D. Two elements are formed into one compound.

Reporting Category 2: Force, Motion, and Energy

A _____force_____ is a push or a pull in a specific direction.

The combination of all forces acting on an object is called _____net force_____.

What are balanced forces? **forces that are equal in strength but act in opposite directions, canceling each other out resulting in no movement**

What are unbalanced forces? **forces that are either unequal in strength or are working in the same direction, resulting in movement**

What direction will each move? Why?

moves to left due to unbalanced forces – greater force to left than to right

ball moves down due to unbalanced forces – force of gravity greater than the upward force

The unit of force is the _____Newton_____.

Force = **mass** **X** **acceleration**

A 50 gram object is accelerating at a rate of 5 m/s. Calculate the force needed to produce this acceleration.

mass = 50 g
acceleration = 5 m/s

F = m X a
F = 50 g X 5 m/s
F = 250 gm/s
F = 250 N

50
X 5
250

What is speed?

the distance an object moves in a period of time

Average speed = **total distance** ÷ **total time**

What is velocity? **how fast an object travels in a particular direction**

What is acceleration? **a change in speed or direction**

A car travels 2.5 hours in a northerly direction for 300 km. Determine the car's speed and velocity.

time = 2.5 hrs
distance = 300 km
direction = north

s = d / t
s = 300 km / 2.5 hrs
s = 120 km/hr
v = 120 kph north

$$2.5 \overline{)\,300.0} = 120$$

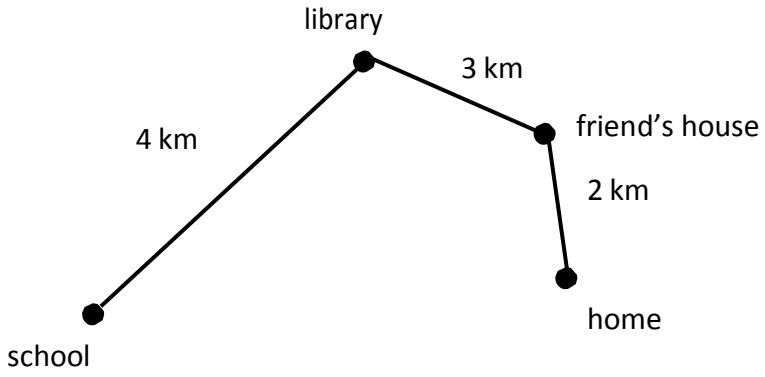
25
50
50
0

Study the diagram below. A student rides a bike 2 hours from school to home, making stops along the way. What is the average speed at which the student travels? Did the student accelerate during the ride home?

time = 2 hrs
distance = 4 km + 3 km + 2 km = 9 km

s = d / t
s = 9 km / 2 hrs
s = 4.5 km/hr

the student did accelerate because she changed directions



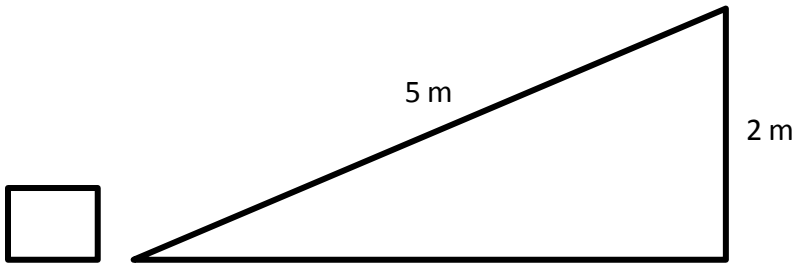
Example of Motion	Speed	Velocity	Acceleration
A greyhound dog can run about 40 mi/hr.	X		
Monarch butterflies fly 12 mi/hr south as they migrate.		X	
A car slows from 60 mi/hr to 25 mi/hr.			X
A car turns left while maintaining the same speed.			X
A trip from Austin to Dallas takes about 3 hours going 65 mi/hr north.		X	
Canadian geese can fly approximately 75 miles in 3 hours.	X		
A car increases speed from 30 mi/hr to 65 mi/hr.			X

The transfer of energy from one object to another is called **work**.

Work = **force** X **distance**

Use the information and diagram below to answer the questions.

A student needs to move the box onto a table that is 2 meters high. She uses 10 newtons of force to move the box.



How much work is done if she pushes the box up the incline?

distance = 5 m
force = 10 N

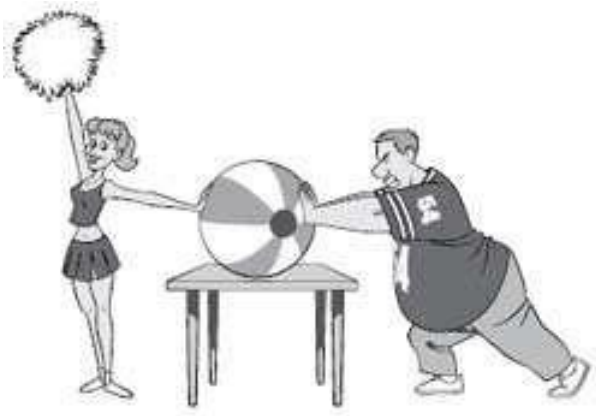
W = F X d
W = 10 N X 5 m
W = 50 Nm
W = 50 J

How much work is done if she lifts the box straight up onto the table?

distance = 2 m
force = 10 N

W = F X d
W = 10 N X 2 m
W = 20 Nm = 20 J

The boy in the picture is pushing against the beach ball with 20 newtons of force. The ball does not move. How much work is he doing?



force = 20 N
distance = 0 m

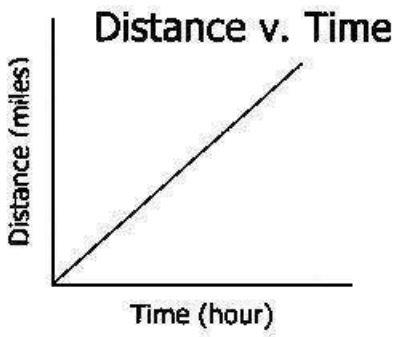
W = F X d
W = 20 N X 0 m
W = 0 Nm = 0 J

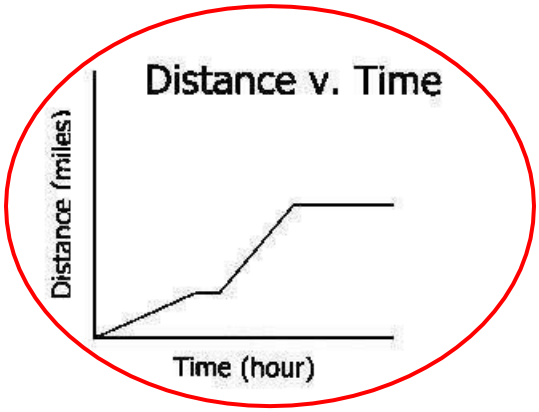
Law of Conservation of Energy states that energy can never be created or destroyed only transferred.

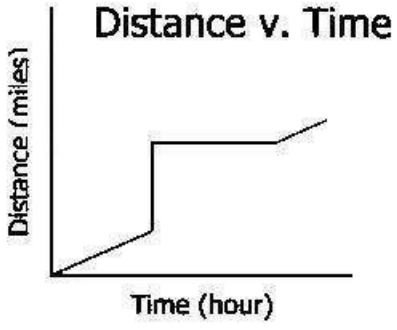
Complete the chart using the types of energy:

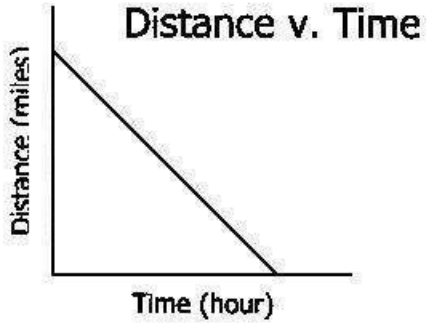
	Beginning Energy Type	Type of Energy Converted To
hair dryer	**electrical**	**thermal**
battery	**chemical**	**electrical**
windmill	**mechanical**	**electrical**
glow stick	**chemical**	**light**
piano	**mechanical**	**sound**

A woman drives to the grocery store. During the trip, the woman drives a constant speed of 35 mph for 5 minutes, then stops at a stop sign. After waiting for traffic, the woman drives an additional 20 minutes at 60 mph before parking in the grocery store parking lot. Circle the distance/time graph that best matches the woman's journey. Justify your answer.



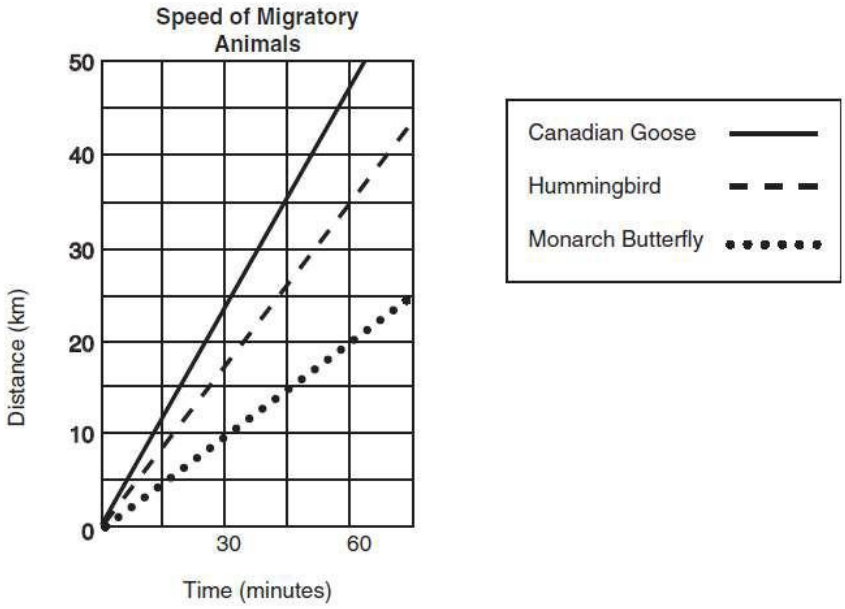






The circled graph is the best answer choice because the graph indicates a slower speed, a brief stopping point, a faster speed, and then another stopping point.

Use the graph below to answer the following questions.

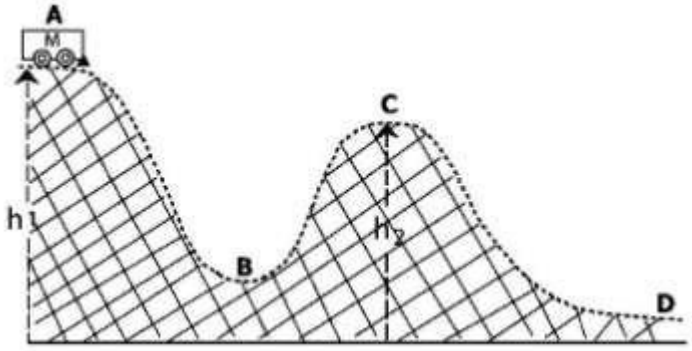


Which animal has the fastest speed? **Canadian Goose**

How far does the hummingbird travel in 60 minutes? **35 km**

What is the speed in km/hr of the monarch butterfly at 60 minutes? **20 km/hr**

Analyze the diagram below.



As the cart moves from point A to point B, the cart's potential energy **decreases** as its kinetic energy **increases**.

As the cart moves from point B to point C, the cart's potential energy **increases** as its kinetic energy **decreases**.

At which of the four points will the cart have the least potential energy? **D**

Potential energy is energy that is stored and available to be used later.

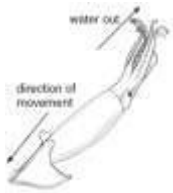
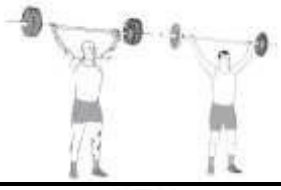
Kinetic energy is energy that an object has because of its motion.

Newton's Laws

balanced / unbalanced inertia

F = m X a

action / reaction = & opposite

	First Law	Second Law	Third Law
			**X**
		**X**	
	**X**		
			**X**

A tennis racket hits a tennis ball, exerting a different amount of force on the ball during a tennis game.

Swing A
F = 20 N

a = F / m

a = 20 N/10 kg

a = 2 m/s^2

Swing B
F = 10 N

a = F / m

a = 10 N/10 kg

a = 1 m/s^2

Swing C
F = 5 N

a = F / m

a = 5 N/10 kg

a = 0.5 m/s^2

Which swing results in the greatest acceleration of the ball?

Swing A

How does Newton's first law of motion apply to a ball rolling across the gym floor after an unbalanced force is applied?

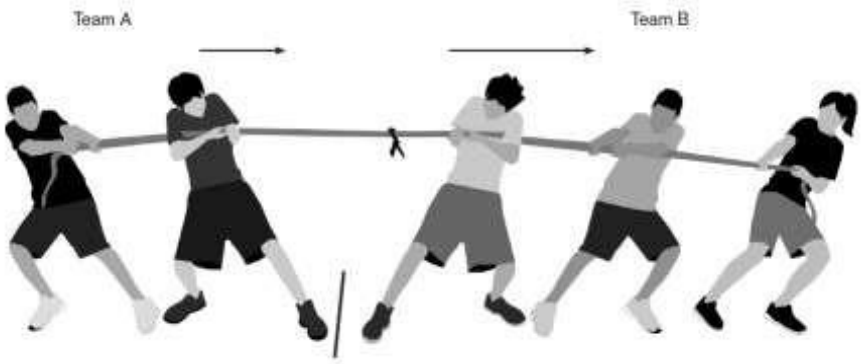
A. The ball will stop at the line halfway across the gym.
B. The ball will continue to roll until an unbalanced force is applied.
C. The ball will start bouncing until it hits the wall.
D. The ball will roll in a zigzag pattern to the other end of the gym.

A person walks out of a store with a pillow at the top of an overflowing shopping cart. While walking to the car, the cart's wheel hits a large rock, causing the cart to suddenly stop. Which of the following is likely to happen as a result of Newton's first law of motion?

F. The pillow will slide backwards due to inertia.
G. The pillow will apply a balanced force on the cart.
H. The pillow will slide forward due to inertia.
J. The pillow will not be affected by the sudden stop.

The law requires all people riding in a car to wear seat belts. If the car suddenly stops, the seat belts hold the passengers in place. How does Newton's first law of motion apply when a person is not wearing a seat belt?

A. The passengers will continue moving forward due to inertia.
B. The passengers will move backward into the seat.
C. The passengers will lean into another passenger's seat.
D. The passengers will not be affected by the sudden stop of the car.



In the picture above, two teams of students are playing tug-of-war. Each team is pulling in the opposite direction, but both teams are moving in the same direction. Which of the following best describes the forces in this situation?

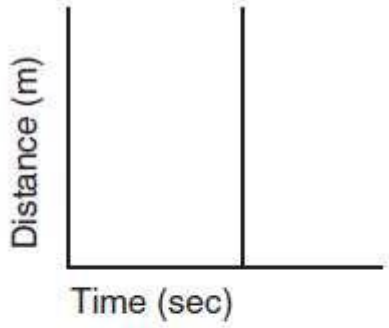
A. The forces are balanced and the net force is zero.
B. The forces are balanced and Team A is exerting a greater force.
C. The forces are unbalanced and Team A's force is greater.
D. The forces are unbalanced and Team B's force is greater.

When a car suddenly stops at a red light, a book lying on the car seat slides forward. Why does the book continue to move forward?

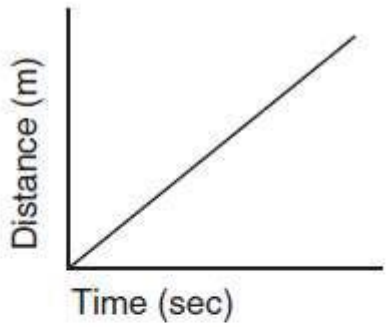
A. The book loses its backward force.
B. The car moves in reverse more rapidly than the book.
C. The friction of braking transfers energy to the book.
D. The book's inertia causes it to continue moving.

Which graph best represents a car traveling down the freeway at a constant speed?

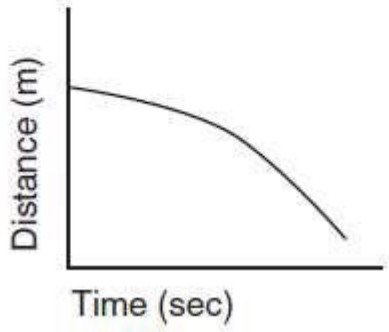
F



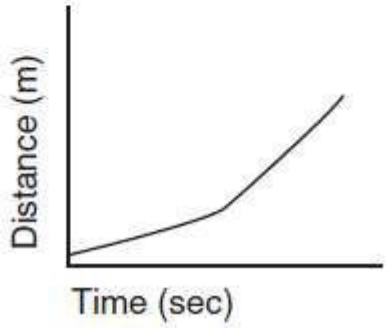
H



G



J



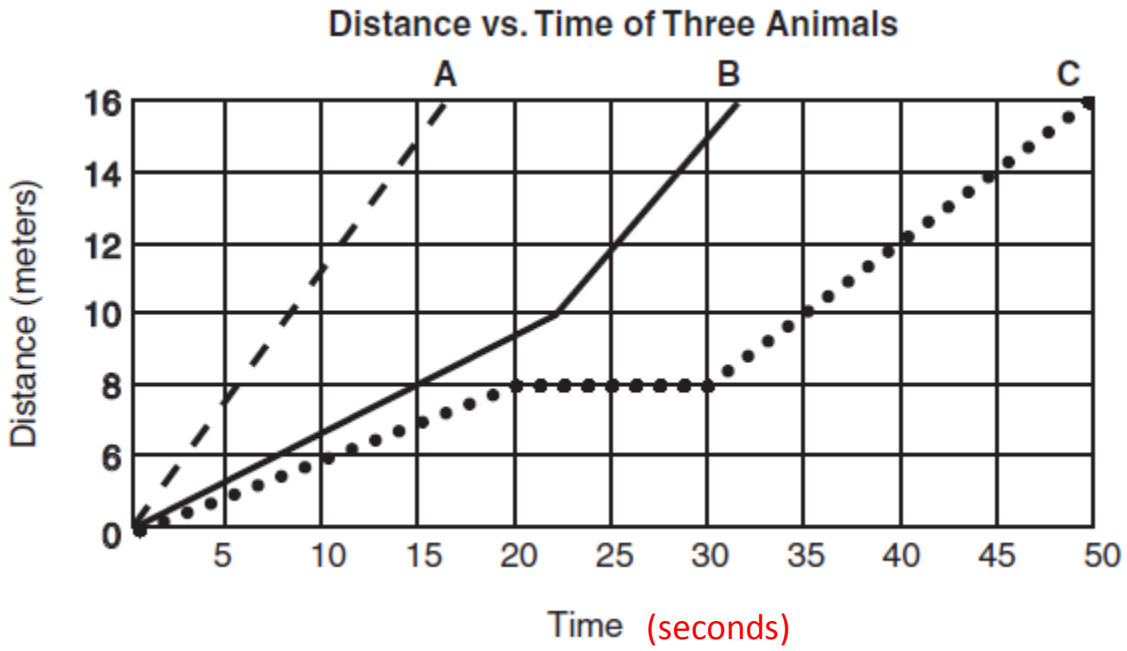
Use the table below to answer question 10.

Object	Mass (g)	Volume (cm^3)
X	38	32
Y	36	19
Z	21	35

10. If a force of 50 N is applied to each of the three objects, which one will have the least acceleration?

F. Object X, because it has the greatest mass
G. Object Y, because it has the least volume
H. Object Z, because it has the least mass
J. Object Z, because it has the greatest volume

Use the information below to answer questions 14–15.



14. What is the average speed of Animal A during the race?

F. 1 m/s
G. 5 m/s
H. 16 m/s
J. 32 m/s

15. If all animals started the race at the same time, which animal has the greatest speed during the first 10 seconds of the race?

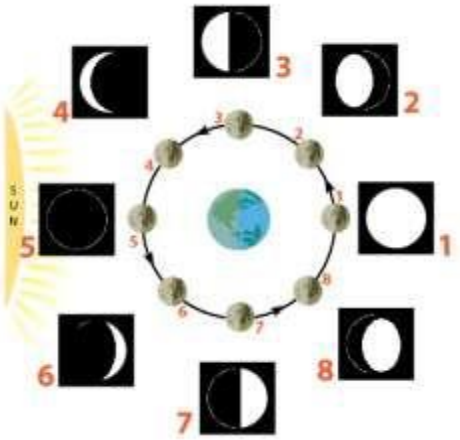
A. Animal A
B. Animal B
C. Animal C
D. Animals B and C

Reporting Category 3: Earth and Space Systems

Moon Phases: draw the phase of the moon as seen from Earth in each of the large circles then write the names of the phases in the correct boxes on the chart

	Moon Phase
1	
2	
3	
4	

	Moon Phase
5	
6	
7	
8	



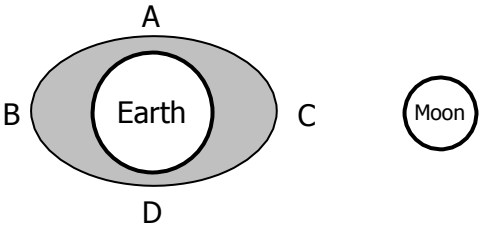
Tides:

What causes tides?

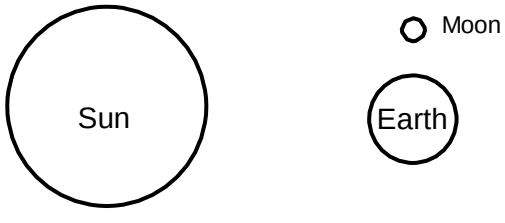
Use the diagram to the right to answer the questions.

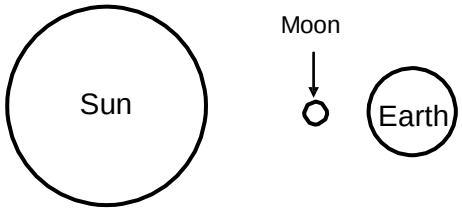
_____ Where is high tide?

_____ Where is low tide?

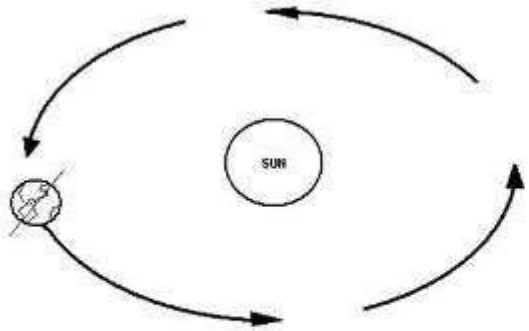


What kind of tide is caused by each arrangement of the sun, moon, and Earth?



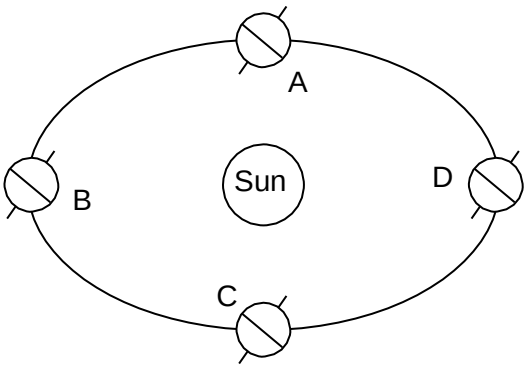


Rotation & Revolution: label the diagrams and tell what each causes



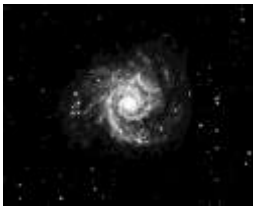
Seasons: Identify the season at each location.

	Northern Hemisphere	Southern Hemisphere
A		
B		
C		
D		



Draw arrow heads on the diagram above to show the direction the Earth moves around the Sun.

Galaxies:

	Type of Galaxy	Amount of Gas & Dust	Age of Stars
			
			
			

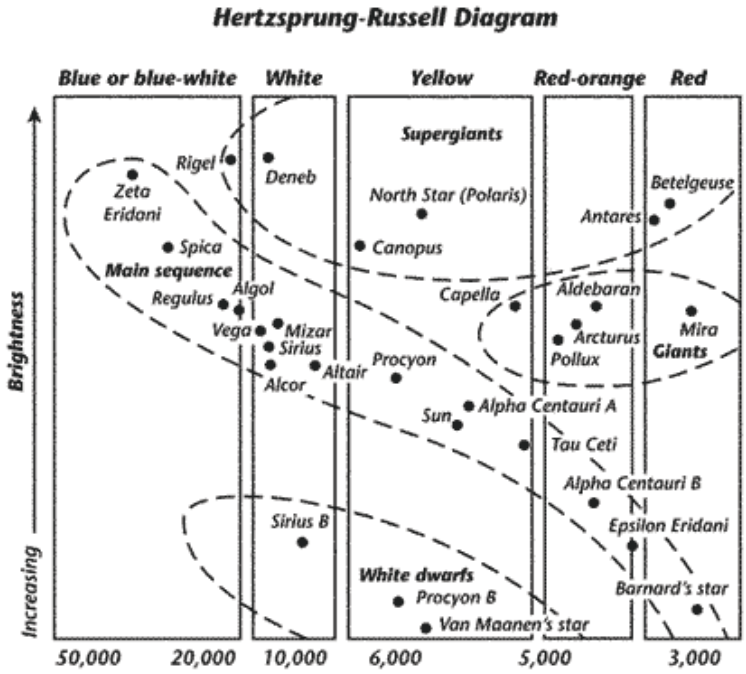
Earth is a member of the_____Galaxy which is a_____galaxy. Our solar system is located near the edge of our galaxy.

Life Cycle of a Star:

	Where Formed	Just Born	Age Increases →			Death
Human	Womb	Baby	Teenager/ young adult	Middle age	Old age	Dead
Low Mass Star						
High Mass Star						
Very High Mass Star						

Mass determines how long a star lives. High mass stars use up their fuel very fast and die sooner than low mass stars.

Hertzsprung-Russell Diagram



A comparison of a star's surface temperature vs. _____.

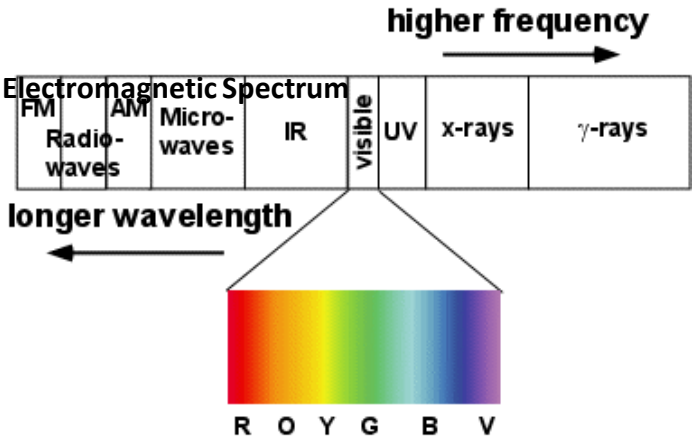
Most stars are part of the _____.

Brightest stars found at the_____of the diagram.

Hottest stars are found at the_____ of the diagram.

Which star is brighter? Why?
Polaris or the Sun

Use the H-R Diagram to describe the Sun.



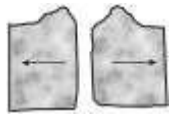
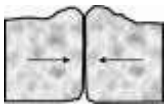
We use visual and radio telescopes to observe objects in space. Visual Telescopes are called refracting and reflecting. **Reflecting** telescopes use mirrors and **refracting** telescopes use lenses to view objects far away. **Radio** telescopes detect the different wavelengths of objects in space.

When looked at through a spectroscope, all objects have a unique spectral pattern. We can tell what elements are in stars and if they are moving towards or away from us by looking at their spectral patterns. The spectrum of stars that are moving away from us is shifted towards the red end of the spectrum. This is called **Red Shift**.

Light-year – a unit of distance – the **distance** that light will travel in one year. Our closest stellar neighbor (after the Sun) is the triple star system Alpha Centauri which is 4.3 LY away. Since one light-year is equal to 9,500,000,000,000 kilometers the Alpha Centauri system is 40,850,000,000,000 kilometers away. It is much easier to represent the distance in light-years.

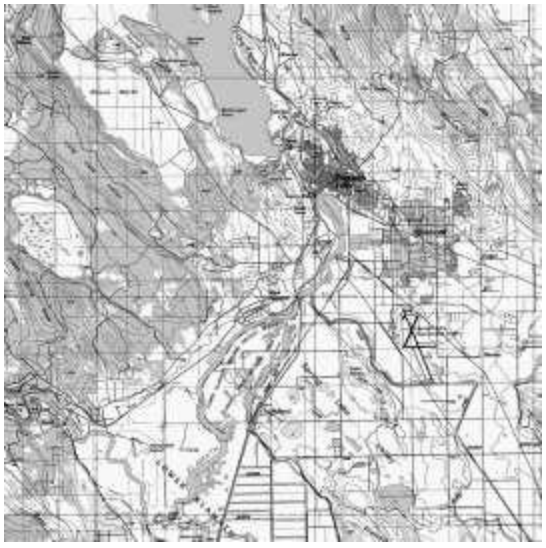
Plate Tectonic Theory

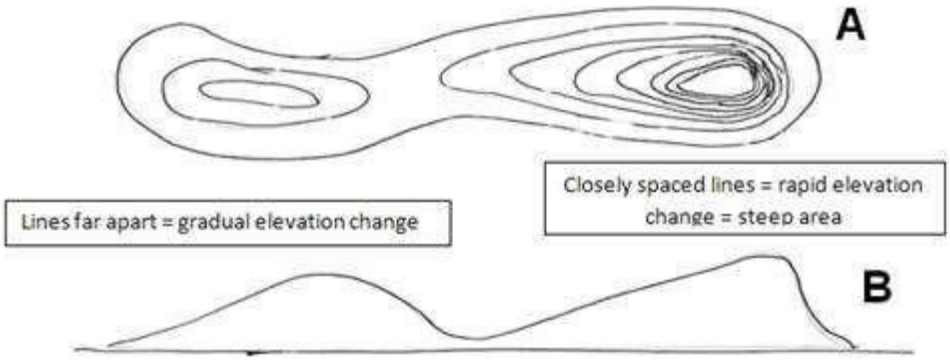
Alfred Wegener proposed Continental Drift (continents were once connected in one large landmass and have slowly moved to their current locations) based on 1) the shape of the continents, 2) fossil evidence, and 3) evidence from glaciers. After WWII scientists discovered spreading centers (mid-ocean ridges) on the ocean floor. This explained how the continents could move. Convection currents in the mantle cause the plates to move.

Diagram	Type of Boundary	Motion at Boundary	Land Feature(s) Formed
			
			
			
			
			

Topographic Maps & Satellite Views

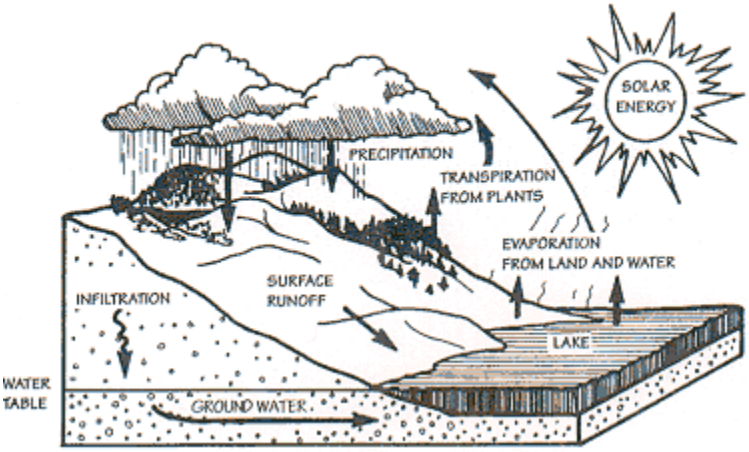
The following map and satellite image are of Klamath Falls, Oregon

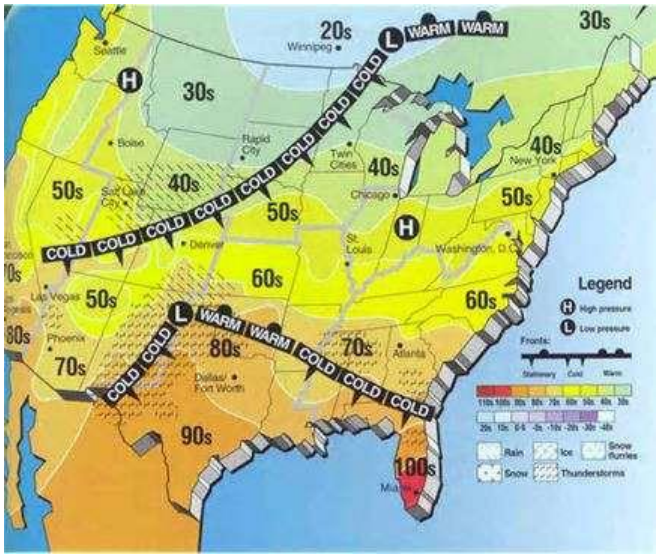


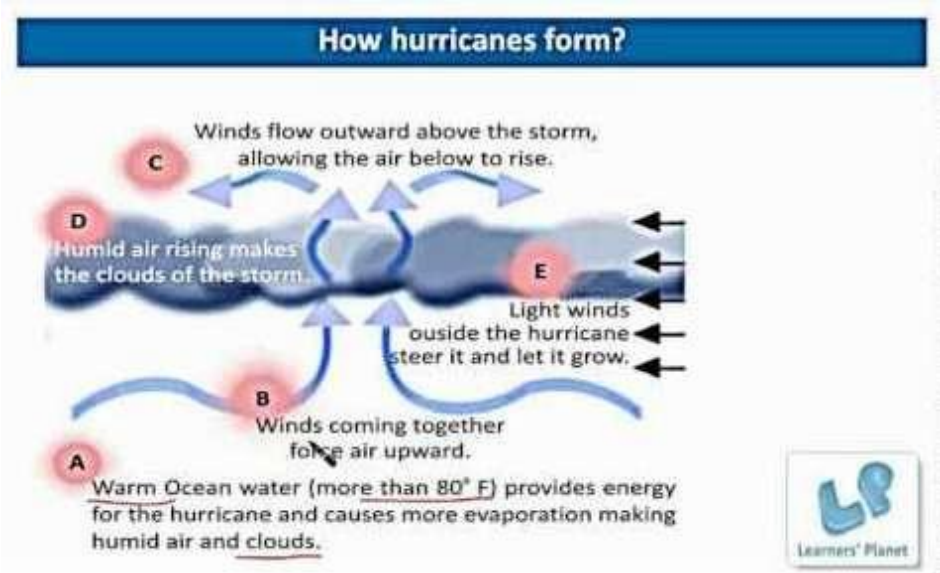


Weather & Climate

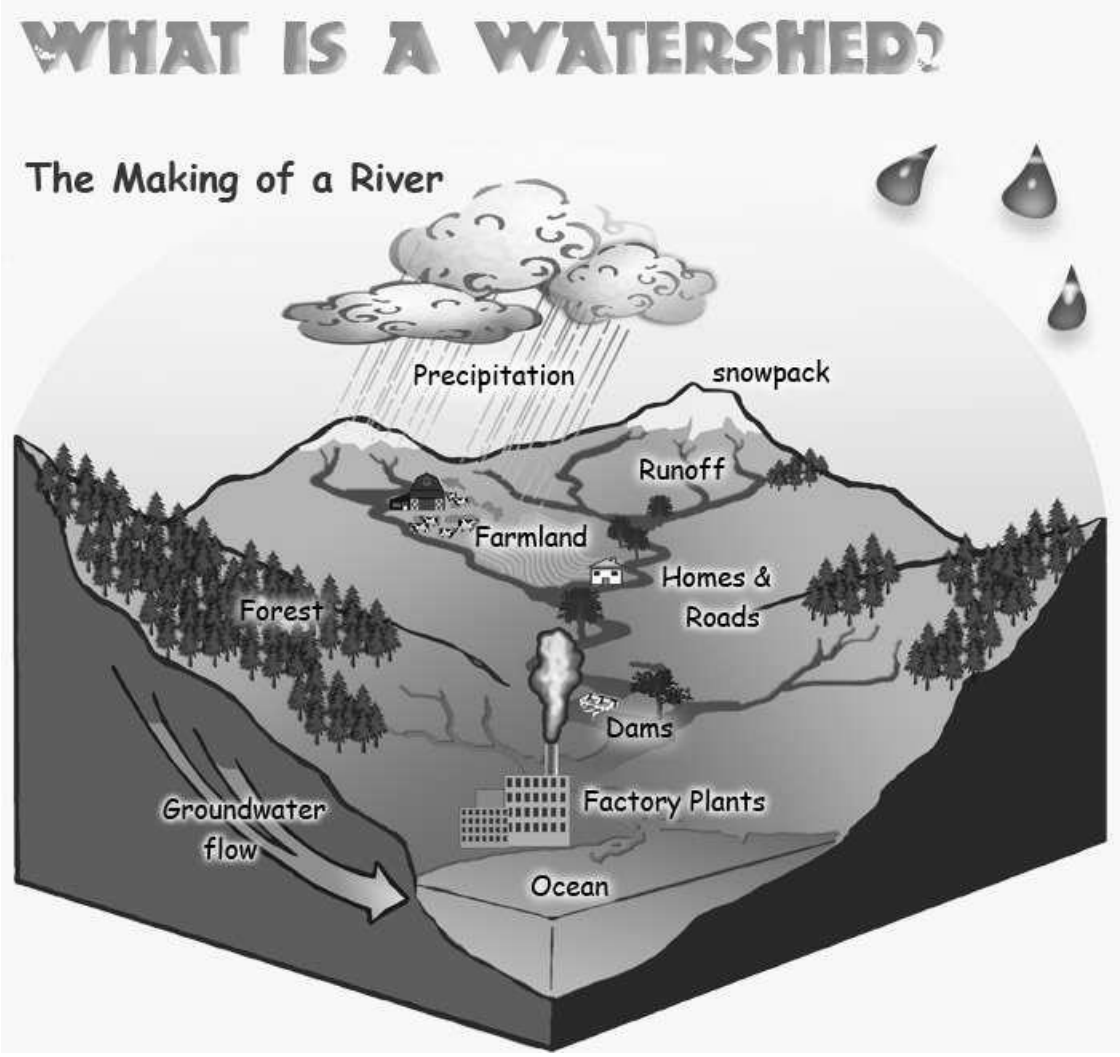
Water Cycle







Natural Events & Human Impact



Melting of the snowpack and increased rainfall can increase the amount of runoff. Human activity like farming, building of homes, roads, dams, and factories can create pollution that is carried by the runoff into the oceans.

Reporting Category 4: Organisms and Environment

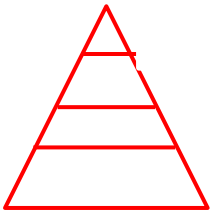
Food Chains

Directions: Put the following organisms in order to create a food chain. Label each trophic level as you go.

Grasshopper	Bear	Grass	Fish

Answer: _____

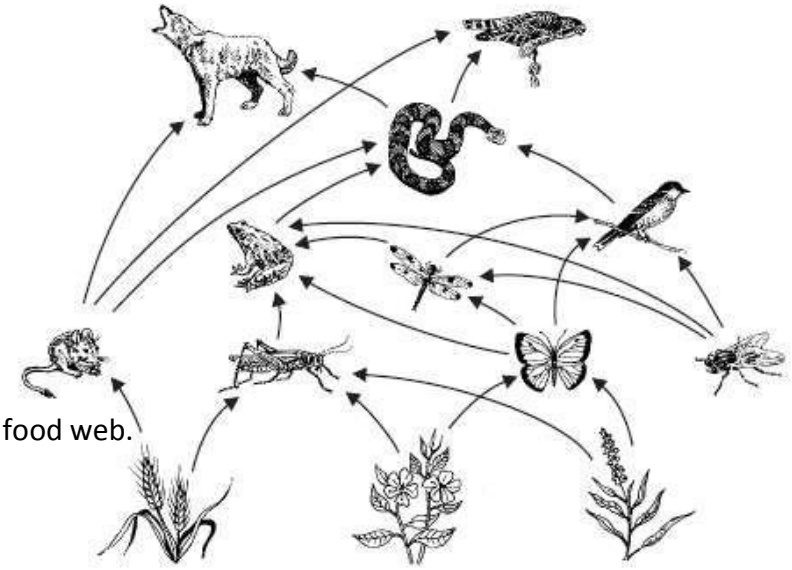
Take the trophic levels above and create an energy pyramid in the space below. Put a happy face next to the level that has the most available energy and a frowny face next to the one with the least.



Food Webs

Directions: Answer the following questions based on the food web provided.

1. Circle the producers.
2. Which of the following organisms feeds on the largest variety of producers?
3. Which consumer feeds on the largest variety of organisms?
4. What would happen if the frog population was removed from this food web?
5. Identify two predator/prey relationships in this food web.



Define and give an example of the following:

Parasite – Host Relationship:

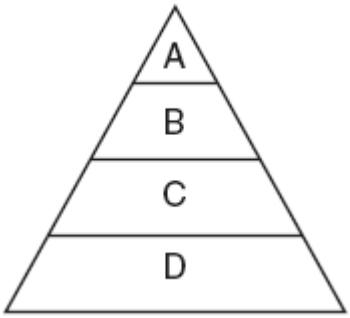
Predator – Prey Relationship:

Biotic:

Abiotic:

Energy Pyramid

Directions: Draw an energy pyramid below. Answer the following questions based on the pyramid.



1. Which level in this pyramid would represent producers?
2. Which level in this pyramid has the least energy available?
3. Which level in this pyramid has the most energy available?
4. How are food chains and energy pyramids related?

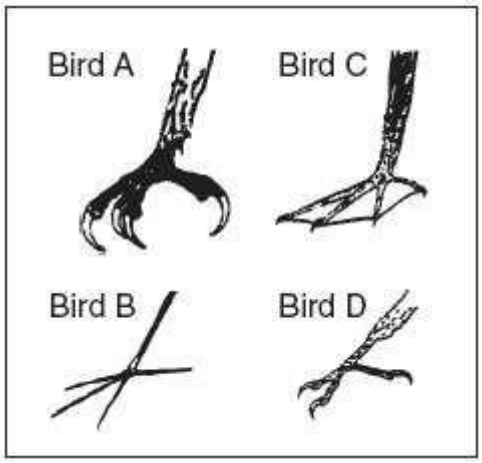
Ecological Succession

What is meant by the term ecological succession?

In the boxes below, sketch out how ecological succession might occur in a garden left unattended. Use an asterisk to mark the most stable stage. Why is it the most stable?

		*

Dichotomous Keys – Use the dichotomous key to identify the following birds.



Bird A –

Bird B –

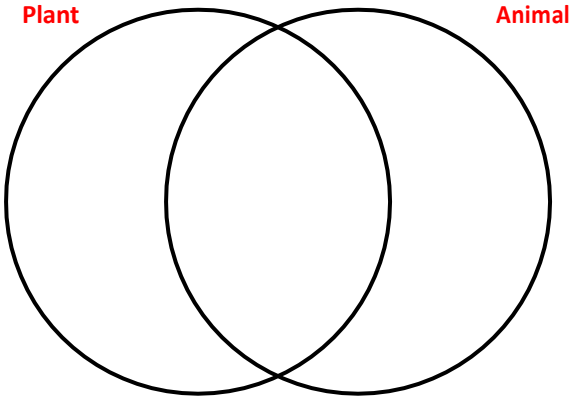
Bird C –

Bird D –

A Key to Identifying Birds		
Couplet	**Description**	
1*a*	Toes webbed	go to 2
1*b*	Toes not webbed	go to 3
2*a*	Four toes webbed together	cormorant
2*b*	Three toes webbed together	duck
3*a*	Claws curved	go to 4
3*b*	Claws not curved	jacana
4*a*	Claws large	eagle
4*b*	Claws small	kingfisher

Cells

Complete the Venn diagram to compare the characteristics of plant and animal cells. Use all of the words in the word bank.



Word Bank

1	cell membrane	**5**	DNA
2	cell wall	**6**	nucleus
3	chloroplasts	**7**	round shape
4	cytoplasm	**8**	square shape

How are prokaryotic and eukaryotic cells different?

Write the name of the correct organelle in the space provided.

Organelle	Function
	Decides what enters and leaves the cell.
	Gel-like substance that all of the organelles float around in.
	Contains the genetic material (chromosomes) that direct all cell activities.
	Power-house of the cell; converts chemical energy in food into energy the cell can use.
	Stores materials like water.
	Protects and supports the cell (found in plant cells only!)
	Converts radiant energy from the sun into chemical energy (glucose). (Found in plant cells only!)

Word Bank:

Cell Wall

Cell Membrane

Mitochondria

Nucleus

Cytoplasm

Chloroplast

Vacuole

Body Systems

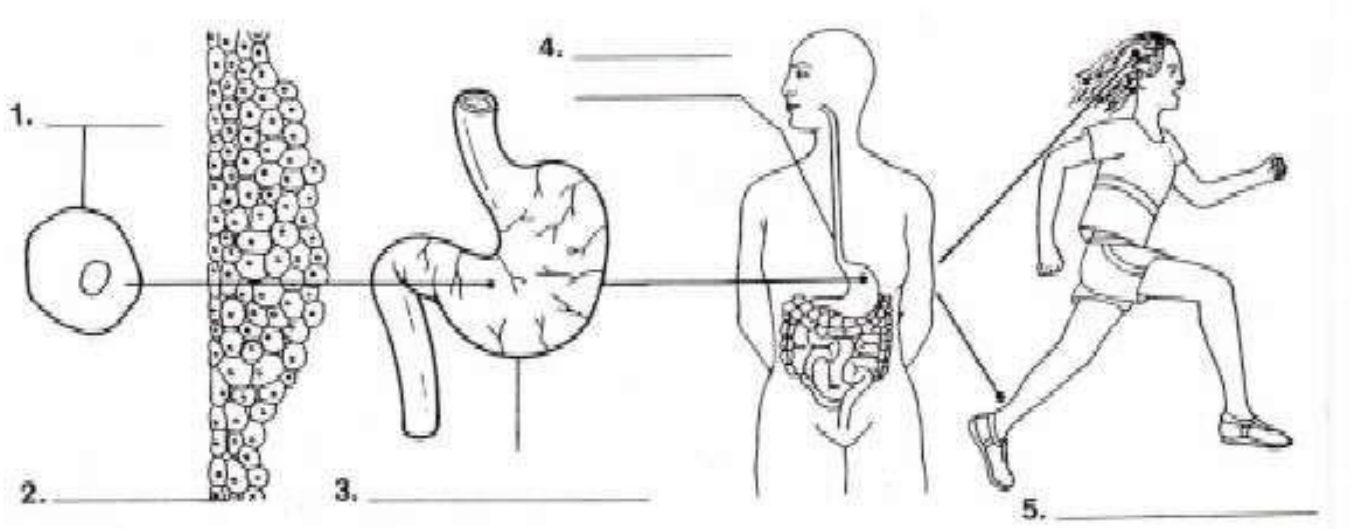
Complete the chart by writing the names of the missing organ systems.

Organ System	Function	Major Organs
	Transports materials	Heart, blood vessels
	Exchanges O_2 and CO_2 gases	Lungs, bronchi
	Breaks down food into useable form	Esophagus, stomach, intestines
	Removes wastes from blood	Kidneys, bladder, ureters, urethra
	Sends messages throughout body	Brain, spinal cord
	Regulates body functions; hormones	Adrenal glands, pituitary gland
	Protects and covers internal structures	Skin, sweat glands
	Produce offspring	Testes, ovaries
	Allows the body to move	Muscles
	Provides shape & support, protects internal organs, stores needed materials, produces blood cells, allows movement	Bones

Word Bank

Circulatory
Digestive
Endocrine
Excretory
Integumentary
Muscular
Nervous
Respiratory
Skeletal
Reproductive

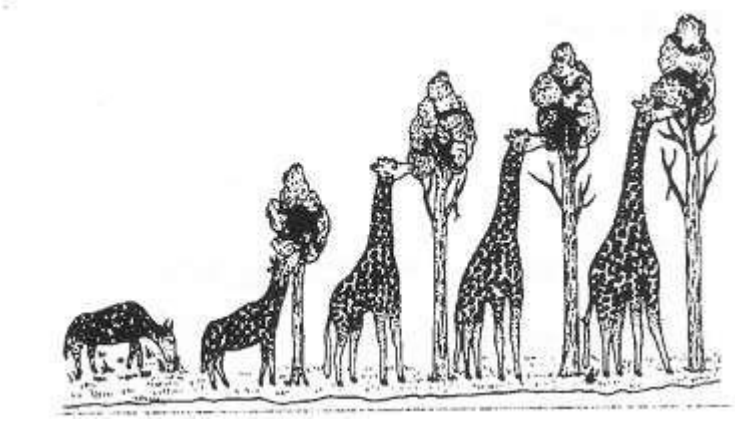
Levels of Organization



Genetics

Genetic information is carried by genes in the chromosomes found in the nucleus of cells.

Genetic traits can change over several generations. Traits that help an organism survive will be passed on while traits that do not help the organism survive will disappear over time.



Giraffe necks became longer over time because the gene for long necks was passed down through the generations. The longer neck allowed the giraffe to eat leaves high in the trees avoiding competition for limited food on the ground.

Changes in the environment can lead to changes in organisms and their traits.

Classification of Organisms

Unicellular –

Multicellular –

Autotrophic –

Heterotrophic –

Sexual reproduction –

Asexual reproduction –

Science Skills

Lab Safety Rules and Equipment

For the following lab scenarios, identify 3 safety rules that must be followed:

1. testing the effects of dye on different fabrics

   _____

   _____

   _____

2. recording the number and types of wildflowers growing in a field

   _____

   _____

   _____

3. Diluting hydrochloric acid with water and finding the pH

   _____

   _____

   _____

Scientific Process

Circle the statements below that represent valid hypotheses:

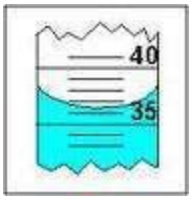
- The clouds are pretty today
- The dogs are mad because they are hungry
- Pedigree dog food makes dogs grow larger
- Grass will not grow in temperatures below 25 degrees Celsius

Laboratory Equipment

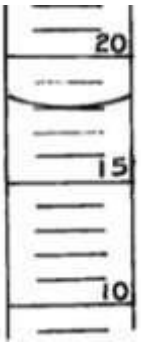
Equipment	Used for:
Beaker 	**Measure and store liquids**
Meter stick 	**Measure length**
Graduated cylinder 	**Measure liquid volume**
Anemometer 	**Measure wind speed**
Psychrometer 	**Measure relative humidity**
Hot plate 	**Heat things**
Spring scale 	**Measure force**
Triple beam balance 	**Measure mass**

Measurement

Volume: Use a graduated cylinder to measure the volume of a liquid by reading the meniscus. Bubble your answer in the grid provided.

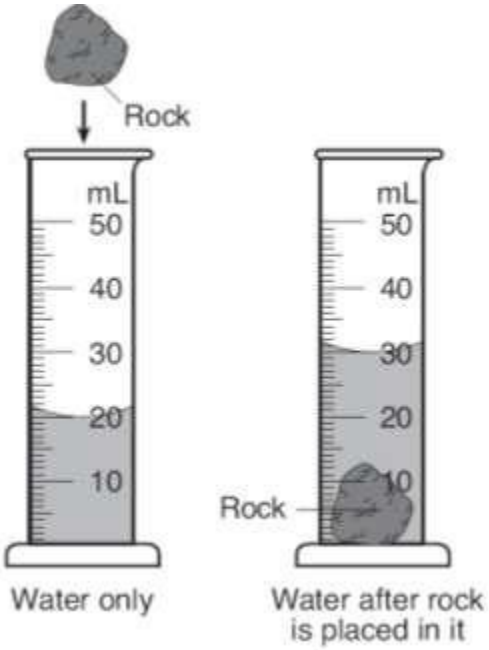


		3	6	.			
0	0	0	0		0	0	0
1	1	1	1		1	1	1
2	2	2	2		2	2	2
3	3	●	3		3	3	3
4	4	4	4		4	4	4
5	5	5	5		5	5	5
6	6	6	●		6	6	6
7	7	7	7		7	7	7
8	8	8	8		8	8	8
9	9	9	9		9	9	9



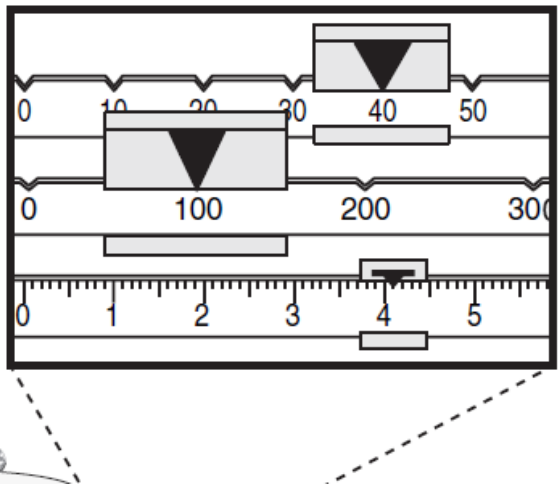
		1	8	.			
0	0	0	0		0	0	0
1	1	●	1		1	1	1
2	2	2	2		2	2	2
3	3	3	3		3	3	3
4	4	4	4		4	4	4
5	5	5	5		5	5	5
6	6	6	6		6	6	6
7	7	7	7		7	7	7
8	8	8	●		8	8	8
9	9	9	9		9	9	9

What is the volume of the rock below?



		1	0	.	0		
0	0	0	●		●	0	0
1	1	●	1		1	1	1
2	2	2	2		2	2	2
3	3	3	3		3	3	3
4	4	4	4		4	4	4
5	5	5	5		5	5	5
6	6	6	6		6	6	6
7	7	7	7		7	7	7
8	8	8	8		8	8	8
9	9	9	9		9	9	9

What is the mass of the triple beam balance reading below?



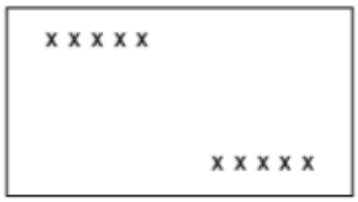
	1	4	4	.	1		
0	0	0	0		0	0	0
1	●	1	1		●	1	1
2	2	2	2		2	2	2
3	3	3	3		3	3	3
4	4	●	●		4	4	4
5	5	5	5		5	5	5
6	6	6	6		6	6	6
7	7	7	7		7	7	7
8	8	8	8		8	8	8
9	9	9	9		9	9	9

Organizing and Evaluating Information (and Diagrams)

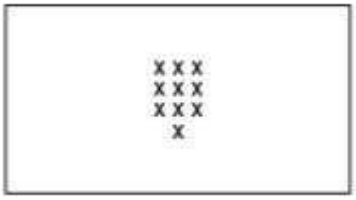
You will be asked to analyze data many times on the STAAR test. Remember, if you see a diagram, graph, or a data table the answer is there for you! Do not give up --- just keep looking until you find it!!!! Here is some practice:

1. The following boxes represent a field. Which pattern for collecting 10 samples would provide the best data for identifying the types of plants in a field?

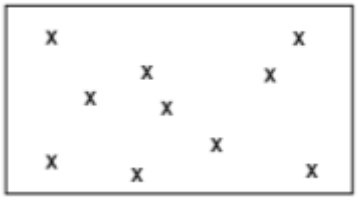
A



C



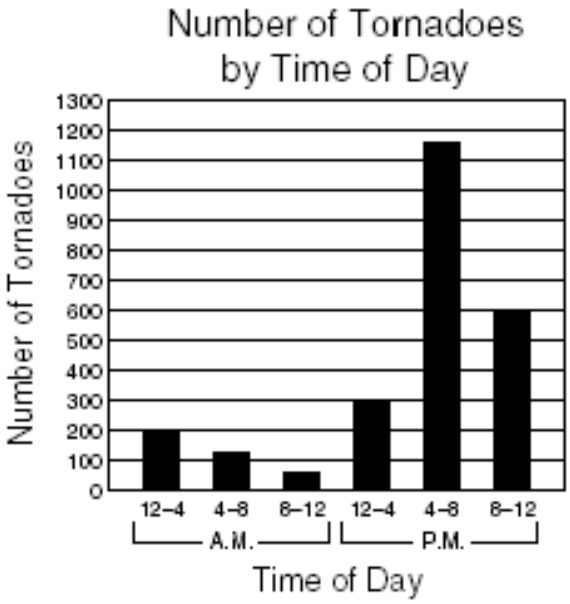
B



D

2. A student prepared this graph of tornadoes reported over a 50-year period in a midwestern state. Which statement is supported by these data?

A Tornadoes are less frequent in the morning.
B Darkness increases the strength of tornadoes.
C Tornadoes occurring at night are brief.
D The probability of a tornado is the same throughout the day.



3. Amber is a type of fossil that formed from tree resin. As sticky resin ran down a tree, insects sometimes became trapped in it. Under certain conditions, ancient resin fossilized into amber with the insects preserved in it.

Which of the following is best supported by the information above?

A Tree resin makes good insect repellent.
B Amber is a beautiful and valuable gemstone.
C Trees can live for long periods of time.
D Some insects lived on trees a long time ago

4. Some students conducted a survey about various energy sources used in Regions Q and R. The data table to the right shows the results of the survey. Which of the following best supports the data?

F Region Q conserves more energy than Region R.
G Both regions spend the same on nonrenewable resources.
H Region Q uses a higher percentage of nonrenewable energy sources than Region R.
J Both regions use a higher percentage of renewable energy sources than nonrenewable sources.

Regional Energy Sources

Energy Source	Percentage of Use	
	Region Q	Region R
Oil	30%	30%
Coal	20%	15%
Nuclear	25%	10%
Solar	5%	10%
Hydroelectric	5%	15%
Wind	5%	10%
Biomass	10%	10%

5.

Temperature (°C)	Grams of Substance That Dissolve in 100 Milliliters of Water			
	Substance W	Substance X	Substance Y	Substance Z
10	5.0	22.0	70.0	37.0
20	8.0	32.0	52.0	37.5
30	10.0	45.0	42.0	38.0
40	15.0	60.0	35.0	38.5
50	20.0	80.0	28.0	39.0
60	26.0	100.0	22.0	39.5
70	33.0	130.0	18.0	40.0

Some students hypothesize that heating a mixture of any substance and water will always increase the amount of the substance that will dissolve in the water. The table shows results of an investigation testing this hypothesis. The results for which of the substances tested weaken this hypothesis?

F Substance W
G Substance X
H Substance Y
J Substance Z

6. A researcher wants to determine the average number of cave crickets that exit a certain cave in the first two hours after sunset. The best procedure for collecting precise data in this investigation is to count crickets exiting —

F the cave on several nights and calculate the average value
G the cave for 15 minutes on one night and multiply by 8
H the caves in the surrounding area on several nights and calculate the average value
J the cave during one night and use this value

STAAR GRADE 8 SCIENCE REFERENCE MATERIALS

FORMULAS

Density = $\frac{\text{mass}}{\text{volume}}$ $D = \frac{m}{V}$

Average speed = $\frac{\text{total distance}}{\text{total time}}$ $s = \frac{d}{t}$

Net force = (mass)(acceleration) $F = ma$

Work = (force)(distance) $W = Fd$