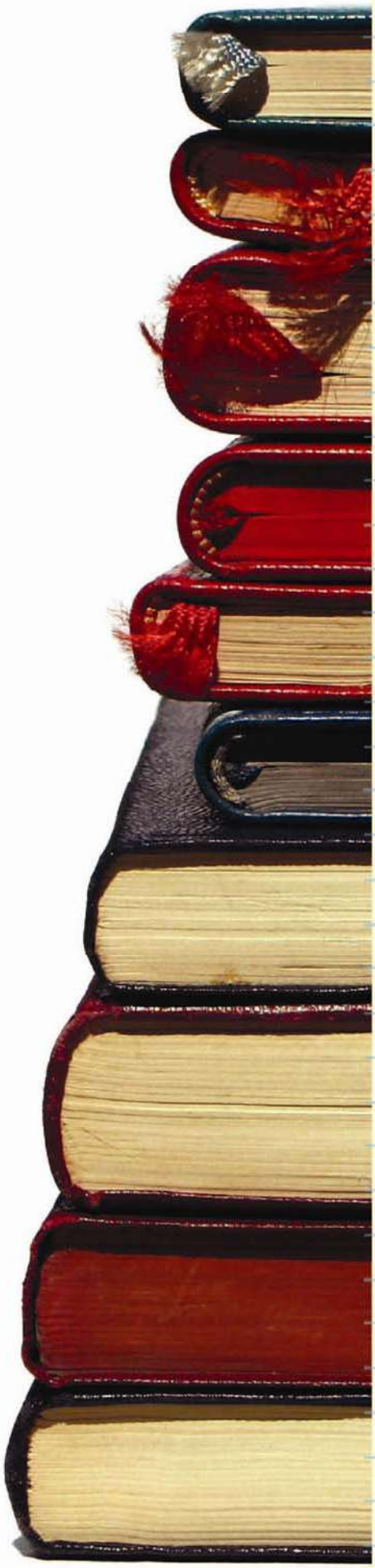


Comprehensive Curriculum

Revised 2008

Physical Science

Louisiana Department of
EDUCATION

Paul G. Pastorek, State Superintendent of Education

Student Safety Contract

Science is a hands-on laboratory class and safety in the science classroom is the #1 priority. To ensure a safe science classroom, a list of rules has been developed and provided to you in this student safety contract. These rules MUST be followed at all times. Two copies of the contract are provided. One copy must be signed by both you and a parent or guardian before you can participate in the laboratory activities. The second copy is to be kept in your science notebook as a constant reminder of the safety rules.

General Guidelines

- Follow all written and verbal instructions. If you do not understand a direction or procedure, ask the teacher before proceeding.
- Do not touch any equipment, chemicals, or other materials in the science room until instructed by your teacher
- Be prepared for class. Read all procedures thoroughly before beginning lab. Bring all required materials such as learning log, calculator, pencil, etc. Never fool around during lab. Horseplay or practical jokes can lead to serious accidents.
- Do not eat, drink, or chew gum in the lab. No lab glassware will be used as containers for food or beverages.
- Keep hands away from face, eyes, mouth and body while using chemicals or preserved specimens. Wash your hands with soap and water after performing all experiments. Clean (with detergent), rinse, and wipe dry all work surfaces (including the sink) and apparatus at the end of the experiment. Return all equipment clean and in working order to the proper storage area.
- Know the location and how to operate all safety equipment such as fire extinguisher, fire blanket, eye wash, and/or shower. Be aware of fire drill exits and procedures.
- Safety goggles must be worn covering eyes during all lab activities.
- Dispose of all chemicals as instructed by your teacher.

Unit 1, Activity 1, Student Safety Contract

Accidents and Injuries

- Report any accident (spill, breakage, etc.) or injury to the teacher immediately, no matter if it appears minor.

- If a chemical should splash into your eye or onto your skin, immediately flush with water. Do not wait to ask the teacher.

Handling Chemicals

- Do not touch, taste, or smell any chemicals, unless specifically instructed. Only waft fumes with your hand to determine if the chemical has an odor.

- Only take as much chemical as needed; do not return unused chemicals to the storage bottle.

Equipment

- Check all glassware before using. Do not use cracked, chipped, or dirty glassware.

- Notify the teacher of any damaged equipment immediately.

- Ask for help from the teacher if you do not understand how to use a piece of equipment

Agreement

I, _____, agree to (a) Follow the teacher's instructions, (b) protect my eyes, face, hands and body during laboratory, (c) conduct myself in a responsible manner at all times in the laboratory, and (d) abide by all the safety regulations specified above.

Student Signature _____ Date _____

Parent's (Guardian's) Signature _____ Date _____

Student Name _____

Unit 1, Activity 1, Student Safety Contract

Dear Parent or Guardian:

We feel that you should be informed regarding the school´s efforts to create and maintain a safe science classroom/laboratory environment.

With the cooperation of the instructors, parents, and students, a safety instruction program can eliminate, prevent, and correct possible hazards.

You should be aware of the safety instructions your son/daughter will receive before engaging in any laboratory work. Please read the list of safety rules above. No student will be permitted to perform laboratory activities unless this contract is signed by both the student and parent/guardian and is on file with the teacher.

Your signature on this contract indicates that you have read this Student Safety Contract, are aware of the measures taken to insure the safety of your son/daughter in the science laboratory, and will instruct your son/daughter to uphold his/her agreement to follow these rules and procedures in the laboratory.

Student's Name _____

Parent's (Guardian's) Signature _____

Date _____

A COOL EXPERIMENT!!

1. Obtain two large beakers (1000 or 500 ml.) and fill them with equal weights of ice, about 2/3 full. Label the beakers A and B.

2. Place an unfrozen freeze pop in each of the beakers so that it is surrounded by ice. Freeze pops are fruit juice enclosed in a long tubular plastic wrap, and can be purchased in most grocery stores.

3. Place a thermometer in each beaker and record the temperature of the ice.

4. Mix one cup of rock salt with the ice in Beaker A.

5. Record the temperatures in each of the beakers every five minutes.

6. Pour another 1/2 cup of salt into beaker A at 15 and 25 minutes into the experiment. Continue taking temperature readings for 30 minutes.

7. Examine the freeze pops at the end of the experiment, and determine which one has frozen and its degree of hardness. Record the results. Eat them quickly before they get soft! With a partner, discuss why the salt-ice mixture produced a lower temperature than the ice with no salt added. Explain that salt has, in a sense, lowered the temperature of the mixture. When ice melts due to the presence of salt, heat is absorbed. This is called an endothermic reaction. What inference does this have for different types of food processing? Salt is used to lower the temperature and increase the rate of ice melting. For example, freight and refrigerator cars use ice and salt to cool foods.

INQUIRY PRESENTATION RUBRIC

Group Members:

1. CONTENT KNOWLEDGE: Inquiry experiment identified, tested, and logically explained data relationships

1	2	3	4	5	6	7	8	9	10
Not Yet				OK			Better		GREAT!

2. ORGANIZATION: Presentation of experiment and data is logical, interesting and easy to follow.

1	2	3	4	5	6	7	8	9	10
Not Yet				OK			Better		GREAT!

3. CONCLUSIONS: Conclusions are correct, thoughtful, and adequately discussed. Errors, if any, are identified and discussed.

1	2	3	4	5	6	7	8	9	10
Not Yet				OK			Better		GREAT!

4. GROUP CO-OPERATION: ALL group members contributed to the development of presentation.

1	2	3	4	5	6	7	8	9	10
Not Yet				OK			Better		GREAT!

5. VISUAL AIDS: Visual aids contributed to the understanding of the presentation.

1	2	3	4	5	6	7	8	9	10
Not Yet				OK			Better		GREAT!

TOTAL _____/50

Split-Page Notes Example for Kinetic Molecular Theory

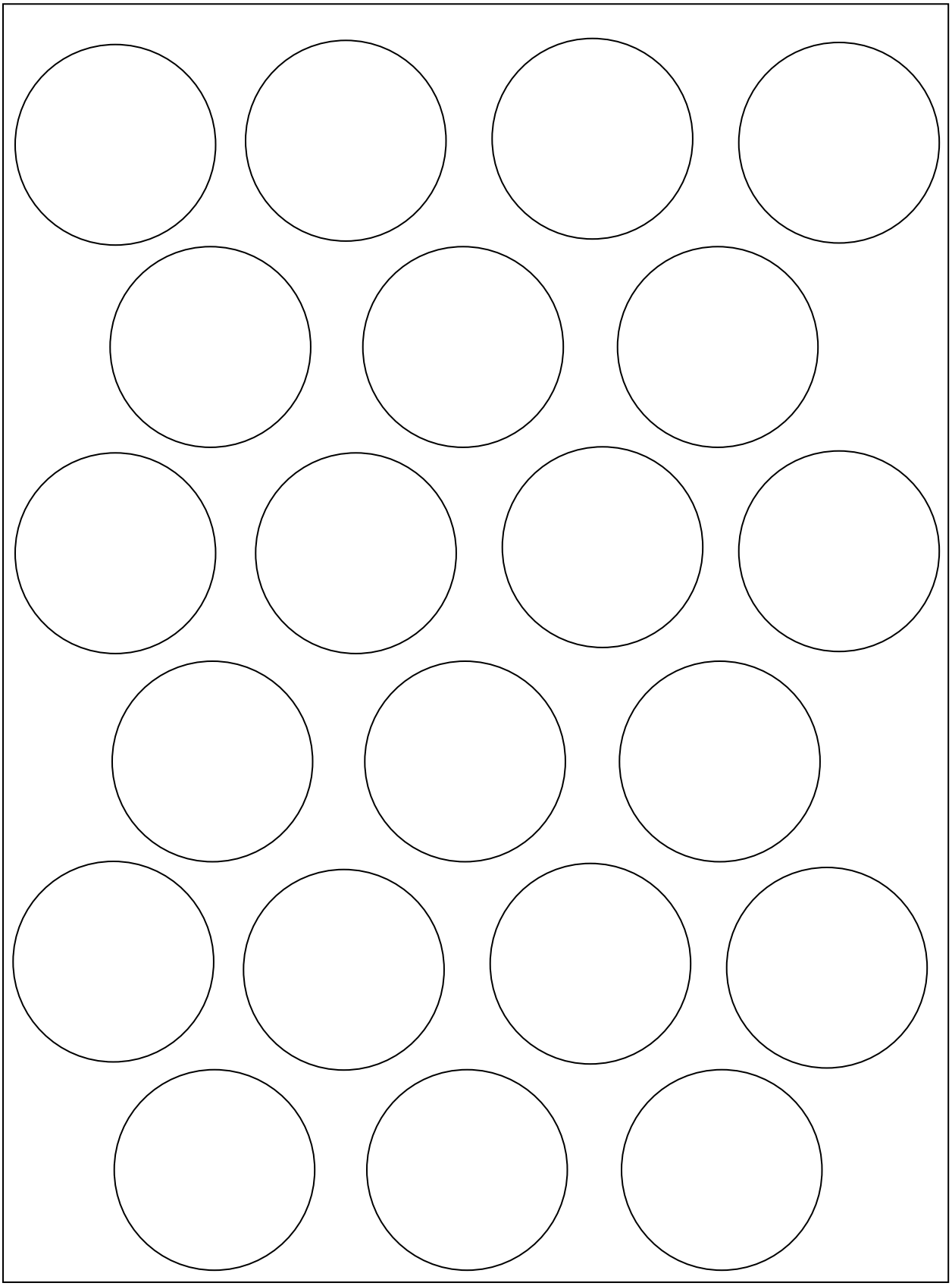
List terms in this column.	*Define each term in this column using notes, lecture, text, internet site, or other source as determined by teacher.*
matter	
atoms	
molecules	
particles	
solid	
liquid	
gas	
average kinetic energy	
absolute zero	
Add more terms, as determined by teacher.	

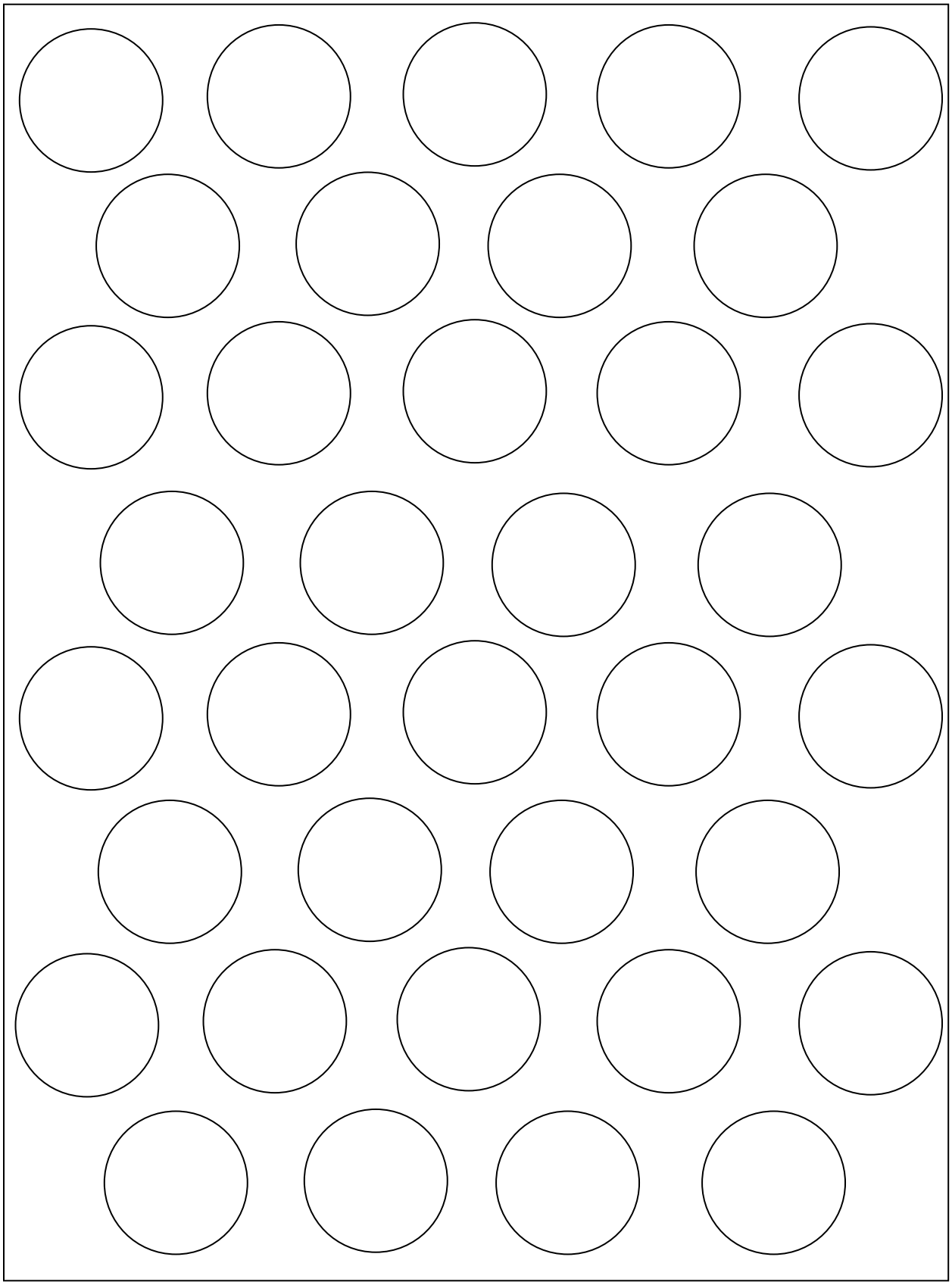
Physical or Chemical Change?

Bag #	Calcium Chloride	Sodium Bicarbonate	Phenol Red	Water	Physical Or Chemical Change	Observations
1						
2	*			*		
3a	*	*				
3b	*	*		*		
4	*	*	*			

Physical or Chemical Change? Answers BLM

Bag #	Calcium Chloride	Sodium Bicarbonate	Phenol Red	Water	Physical or Chemical Reaction	Observations
1		*		*	*Physical reaction (dis-solving)*	*White solid, partially dissolves, bag feels noticeably colder, final solution is chalky white*
2	*			*	*Physical reaction (dis-solving)*	*White solid dissolves in water, bag feels hotter, final solution colorless or may be cloudy*
3a	*	*			*Physical reaction (mixing)*	*No reaction, white solids that retain their individual appearance after mixing*
3b	*	*		*	*Chemical reaction*	*Solution bubbles and fizzing noise is heard, bag expands due to gas production, bag feels hot, solids react with each other, final solution is chalky white*
4	*	*	*		*Chemical reaction*	*Solution bubbles and fizzing noise is heard, bag expands due to gas productions, bag feels hot, solids react with each other, immediate color change from red to yellow, final solution is chalky yellow*





Unit 3, Activity 5, Families of the Periodic Table with Answers

Family/ Group Number	**Metal**	**Non-metal**	**Metalloid**	**Number of Valence Electrons**	**Oxidation Number**	**Physical Properties**	**Chemical Properties**	**Solid, Liquid, or Gas**
Alkali Metals Group 1	√ *H, Li, Na, K, Rb, Cs*	√ *H*		*1*	*+1*	*naturally as compounds; good*	*highly reactive, esp with*	*gas-H all others are solids*
Alkali Earth Metals Group 2	√ *Be,Mg, Ca, Sr, Ba, Ra*			*2*	*+2*	*naturally as compounds; good*	*highly reactive forms ionic*	*solids*
Transition Metals Groups 3-10	√			*usually 1or 2*	*usually +1 or +2*	*all metals, reative, conductors*	*not all the same, differ for each one*	*solids except for liquid, Hg*
Boron Family Group 13	√	√ *Al, Ga, In, Tl*	√ *B*	*3*	*+3*	*scarce except for Al*	*reactive at moderate temperature*	*solids*
Carbon Family Group 14	√ *Sn, Pb*	√ *C*	√ *Si, Ge*	*4*	*+4/ ¯4*	*wide range of properties*	*tend to form covalent bonds*	*solids*
Nitrogen Family Group 15	√ *Bi*	√ *N, P*	√ *As, Sb*	*5*	*¯3*	*N is most common in atmosphere*	*tend to form covalent bonds*	*gas N solids P, As, Sb, Bi*
Oxygen Family Group 16		√ *O, S, Se*	√ *Te, Po*	*6*	*¯2*	*O and S tend to exist as diatomic*	*tend to form covalent bonds*	*gases: O Solids, S, Se,l Te, Po*
Halogens Group 17		√ *R, Cl, Br,I, At*		*7*	*¯1*	*tend to exist as diatomic molecules*	*most reactive elements*	*gases F, Cl, liquid Br solids I, At*
Noble Gases Group 18		√ *He, Ne, Ar, Kr, Xe, Rn*		*8*	*0*	*all are gases*	*do not react with other elements*	*gases*

WRITING CHEMICAL FORMULAS

Write correct formulas of the compounds formed when the cations in the vertical column combine with the anions across the top row. Always write the cation first, followed by the anion. Criss-cross the superscripts. Write the final formula and the name of the compound. The first one is done for you.

	chlorine Cl^{-1}	nitrate $(NO_3)^{-1}$	sulfate $(SO_4)^{-2}$	carbonate $(CO_3)^{-2}$	hydroxide (OH)–1
zinc Zn^{+2}	$Zn^{+2}\ Cl^{-1}$ $Zn_1\ Cl_2$ $ZnCl_2$ *zinc chloride*				
calcium Ca^{+2}					
sodium Na^{-1}					
ammonium $(NH_4)^{+1}$					
copper (II) Cu^{+2}					
potassium K^{+1}					

HYDROCARBONS

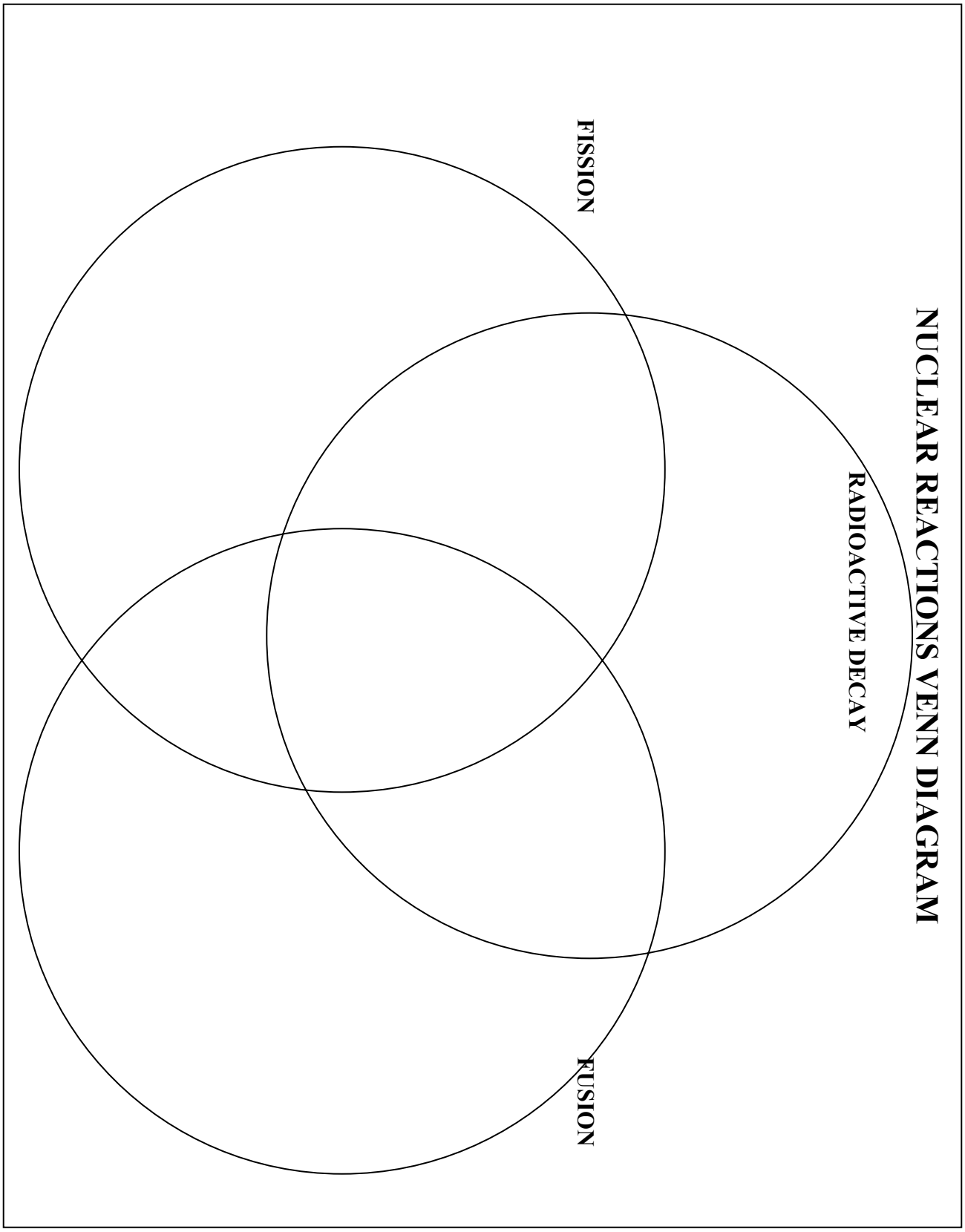
Hydrocarbons are covalently-bonded molecules made of either completely of hydrogen and carbon or mainly carbon and hydrogen with other compounds bonded to the main chain of carbon. Since carbon can form four covalent bonds, there are many possible combinations to form various hydrocarbon compounds.

Use your gumdrops and toothpicks to build representative molecules of the following compounds. Use green gumdrops to represent carbon, white gumdrops to represent hydrogen, red gumdrops to represent oxygen, and yellow gumdrops to represent nitrogen.

1. methane CH_4
2. ethane C_2H_6
3. propane C_3H_8
4. butane C_4H_{10}
5. octane C_8H_{18}
6. ethane CH_2CH_2
7. benzene C_6H_6 Hint: It is a ring
8. methanol CH_3OH
9. ethanol CH_3CH_2OH

And a few other molecules! Identify the colors of your atoms.

10. nitrogen dioxide NO_2
11. carbon dioxide CO_2
12. dihydrogen monoxide H_2O


NUCLEAR REACTIONS VENN DIAGRAM
FISSION
RADIOACTIVE DECAY
FUSION

Is Nuclear Energy Safe Opinionnaire?

Read each statement and using an ink pen, circle if you agree or disagree with each statement prior to our upcoming classroom debate. You will complete the post-debate section after the completion of our debate.

1. Nuclear energy has always been used to benefit mankind such as nuclear radiation for cancer treatments, irradiation of food for food sanitation, and nuclear power for the production of electricity.

pre-debate		post-debate	
agree	disagree	agree	disagree

2. Nuclear power plants need less fuel than ones which burn fossil fuels. One ton of uranium produces more energy than is produced by several million tons of coal or several million barrels of oil.

pre-debate		post-debate	
agree	disagree	agree	disagree

3. In 1979, the cooling system failed at the Three Mile Island nuclear reactor near Harrisburg, Pennsylvania. Radiation leaked, forcing tens of thousands of people to flee. The problem was solved minutes before a total meltdown would have occurred. Fortunately, there were no deaths, but nuclear energy is still too dangerous to have Nuclear Power Plants all over the United States.

pre-debate		post-debate	
agree	disagree	agree	disagree

4. All exposure to nuclear radiation is harmful to humans. We should try to avoid it at all costs.

pre-debate		post-debate	
agree	disagree	agree	disagree

5. Radiation therapy, commonly called Chemo, has been extremely useful in treating and curing many forms of cancer.

pre-debate		post-debate	
agree	disagree	agree	disagree

6. Irradiation with gamma ray radiation is used for killing bacteria on food, sterilizing medical products such as surgical gloves, destroying bacteria in cosmetics, making nonstick cookware coatings, purifying wool, performing security checks on hand luggage at airports, and making tires more durable. It is very useful and offers no risk to humans.

pre-debate		post-debate	
agree	disagree	agree	disagree

Chemical Reaction Types Demonstration

Single Replacement

$Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

$2Al + 3CuCl_2 \rightarrow 2AlCl_3 + 3Cu$

Double Replacement

$3CaCl_2 + 2Na_3PO_4 \rightarrow 6NaCl + Ca_3(PO_4)_2$

Combination (or Synthesis)

$2Fe + 3O_2 \rightarrow 2Fe_2O_3$

$2Mg + O_2 \rightarrow 2MgO$

Combustion

$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

Decomposition

$2H_2O_2 \rightarrow 2H_2O + O_2$

Neutralization (special Double Replacement)

$HCl + NaOH \rightarrow NaCl + H_2O$

Types of Chemical Reactions

Identify the following types of chemical reactions as combination, decomposition, single replacement, double replacement, or combustion.

$Al + CuCl_2 \text{ ---> } Cu + AlCl_3$ _____

$Ag_2O \text{ ---> } Ag + O_2$ _____

$AgNO_3 + KCl \text{ ---> } AgCl + KNO_3$ _____

$C_2H_6 + O_2 \text{ ---> } CO_2 + H_2O$ _____

$Fe + O_2 \text{ ---> } Fe_2O_3$ _____

$AgNO_3 + NaCl \text{ ---> } AgCl + NaNO_3$ _____

$Zn + H_2SO_4 \text{ ---> } ZnSO_4 + H_2$ _____

$MgCl_2 \text{ ---> } Mg + Cl_2$ _____

$BaO + CO_2 \text{ ---> } BaCO_3$ _____

$CH_4 + O_2 \text{ ---> } CO_2 + H_2O$ _____

$NaCl + H_2SO_4 \text{ ---> } Na_2SO_4 + HCl$ _____

Types of Chemical Reactions

Identify the following types of chemical reactions as combination, decomposition, single replacement, double replacement, or combustion.

$Al + CuCl_2 \text{ ---> } Cu + AlCl_3$ — *SINGLE REPLACEMENT*

$Ag_2O \text{ ---> } Ag + O_2$ — *DECOMPOSITION*

$AgNO_3 + KCl \text{ ---> } AgCl + KNO_3$ — *DOUBLE REPLACEMENT*

$C_2H_6 + O_2 \text{ ---> } CO_2 + H_2O$ — *COMBUSTION*

$Fe + O_2 \text{ ---> } Fe_2O_3$ — *COMBINATION*

$AgNO_3 + NaCl \text{ ---> } AgCl + NaNO_3$ — *DOUBLE REPLACEMENT*

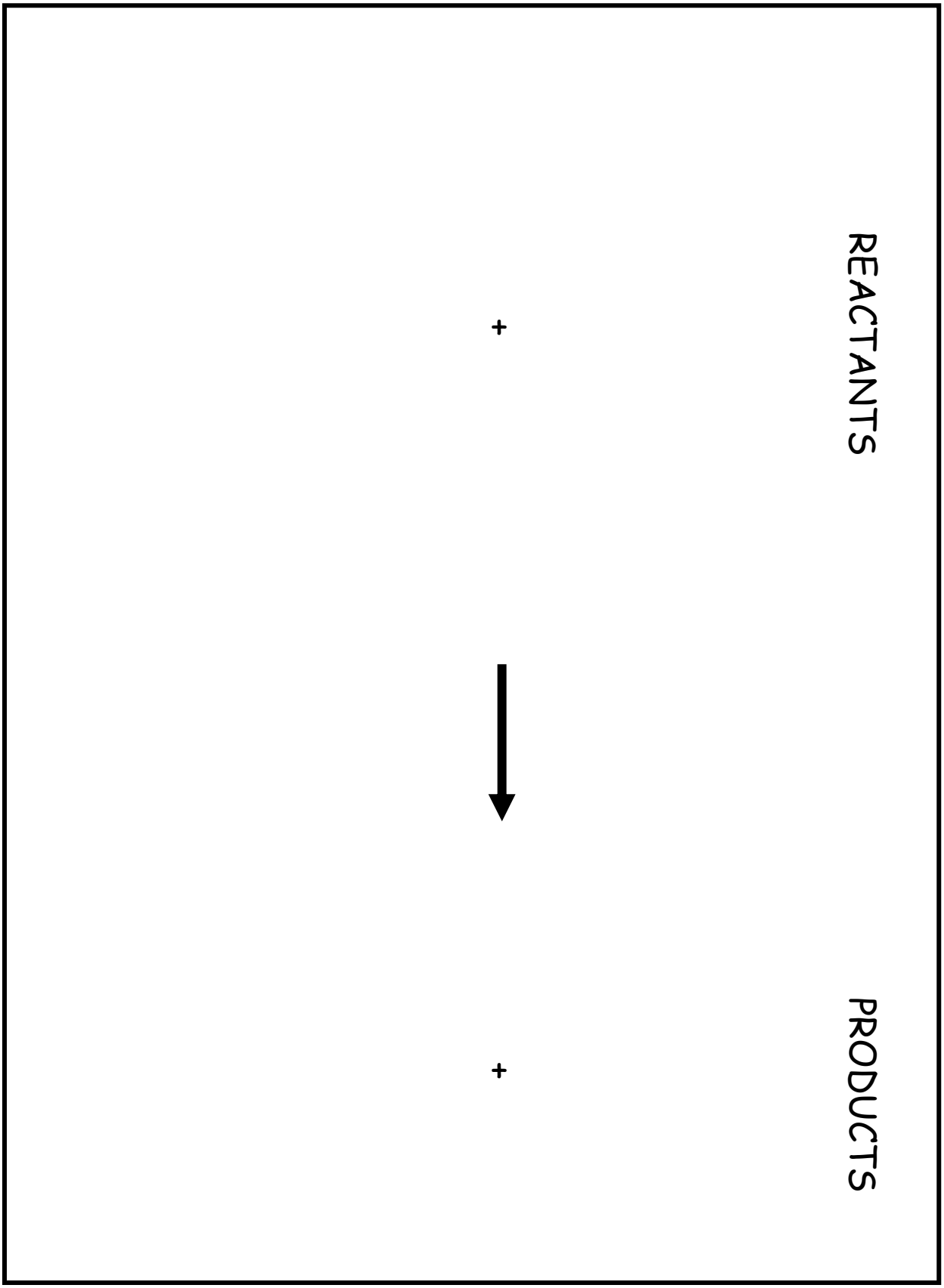
$Zn + H_2SO_4 \text{ ---> } ZnSO_4 + H_2$ — *SINGLE REPLACEMENT*

$MgCl_2 \text{ ---> } Mg + Cl_2$ — *DECOMPOSITION*

$BaO + CO_2 \text{ ---> } BaCO_3$ — *COMBINATION*

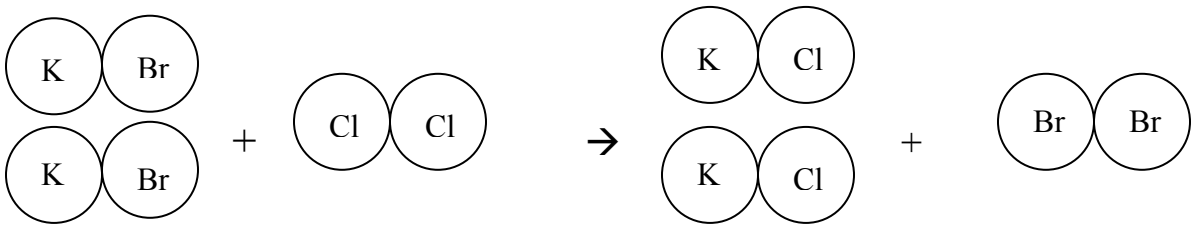
$CH_4 + O_2 \text{ ---> } CO_2 + H_2O$ — *COMBUSTION*

$NaCl + H_2SO_4 \text{ ---> } Na_2SO_4 + HCl$ — *DOUBLE REPLACEMENT*


REACTANTS
+
PRODUCTS
+

1. _2_ KBr + ___ Cl_2 → _2_ KCl + ___ Br_2

Concept Representation:



2. ___ Zn + ___ HCl → ___ $ZnCl_2$ + ___H_2

Concept Representation:

3. ___ Al + ___ O_2 ---> ___ Al_2O_3

Concept Representation:

4. ____ Na + ____ H_2O → ____ NaOH + ____ H_2

Concept Representation:

5. ___ $Al(OH)_3$ + ___ H_2SO_4 ---> ___ $Al_2(SO_4)_3$ + ___ H_2O

Concept Representation:

Mass vs. Weight

Mass is a measure of the amount of matter (stuff) in an object. Weight is a measure of the gravitational force pulling on an object. *Mass is always constant* for an object and does not change, no matter where the object is in the universe. *Weight varies* depending on where the object is in relation to the Earth or other large body in the universe. For instance the weight of an object on the moon is one-sixth of its weight on Earth, because the moon's gravitational force is one-sixth that of the Earth.

Procedures:

1. Using the balance, measure the mass of each item listed below.
2. Record your data.
3. If necessary, place object in baggie and attach to spring scale.
4. Using the spring scale, measure the weight of each item listed below.
5. Record your data.
6. Complete the rest of Table 1.

Data Table:

Item	Mass on Earth (g)	Mass on the Moon (g)	Weight on Earth (N)	Mass on the Moon (N)
book				
battery				
stopper				
glue stick				
100 g mass				

Data Analysis:

1. On a piece of graph paper, construct a weight vs. mass graph, with mass (g) on the x-axis and weight (N) on the y-axis.
2. Plot the points for the Earth data using one color, and draw a best-fit curve or line.
3. Plot the points for the Moon data using a second color, and draw a best-fit curve or line.

Using your graph, answer the following questions:

1. On Earth, how many grams of mass does it take to produce a force of 1 newton?

2. What would the weight of an object that is 3 N on the Earth be on the Moon?

3. If an object had a mass of 245 g on Earth, what would its mass be on the moon?

4. If an object weighed 0.75 N on the moon, what would its mass be on Earth?

Conclusion:

1. Does the mass of an object change when you go to the Moon? Explain.

2. Does the weight of an object change when you go the Moon? Explain.

3. What instrument is normally used to measure mass? To measure weight? Explain why.

4. Even though mass and weight are not the same, are they related for an object? Explain your answer.

Using your graph, answer the following questions:

5. On Earth, how many grams of mass does it take to produce a force of 1 newton?
   1000 g

6. What would the weight of an object that is 3 N on the Earth be on the Moon?
   0.5 N

7. If an object had a mass of 245 g on Earth what would its mass be on the moon?
   245 g

8. If an object weighed 0.75 N on the moon what would its mass be on Earth?
   .46 kg or 460 g

Conclusion:

4. Does the mass of an object change when you go to the Moon? Explain.

   No, mass is an intrinsic property of matter and does not change for an object.

5. Does the weight of an object change when you go the Moon? Explain.

   Yes, because the Moon has 1/6 of the gravity that Earth does.

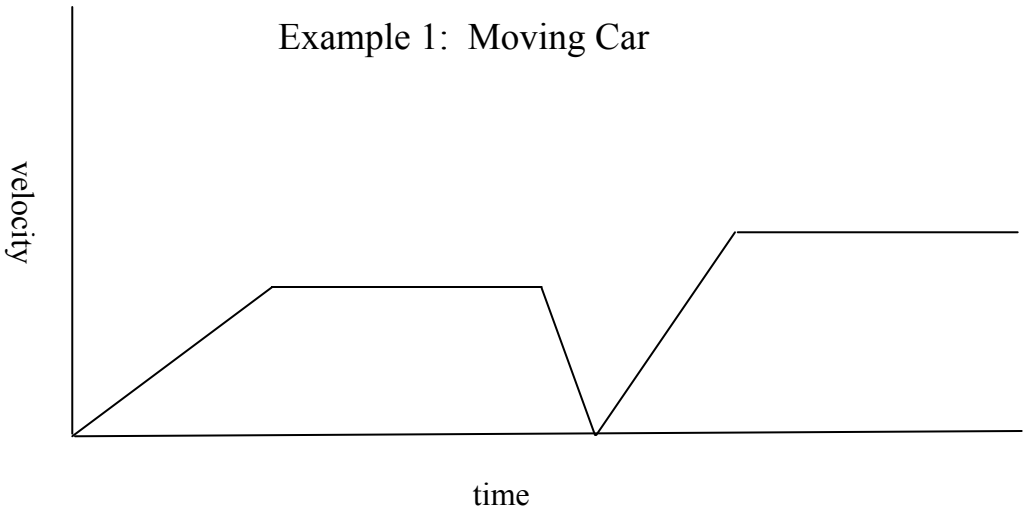
6. What instrument is normally used to measure mass? To measure weight? Explain why.

   A balance because you compare an object to know masses.
   A scale because you determine the force of gravity acting on an object (it pulls downward).

4. Even though mass and weight are not the same, are they related for an object? Explain your answer.

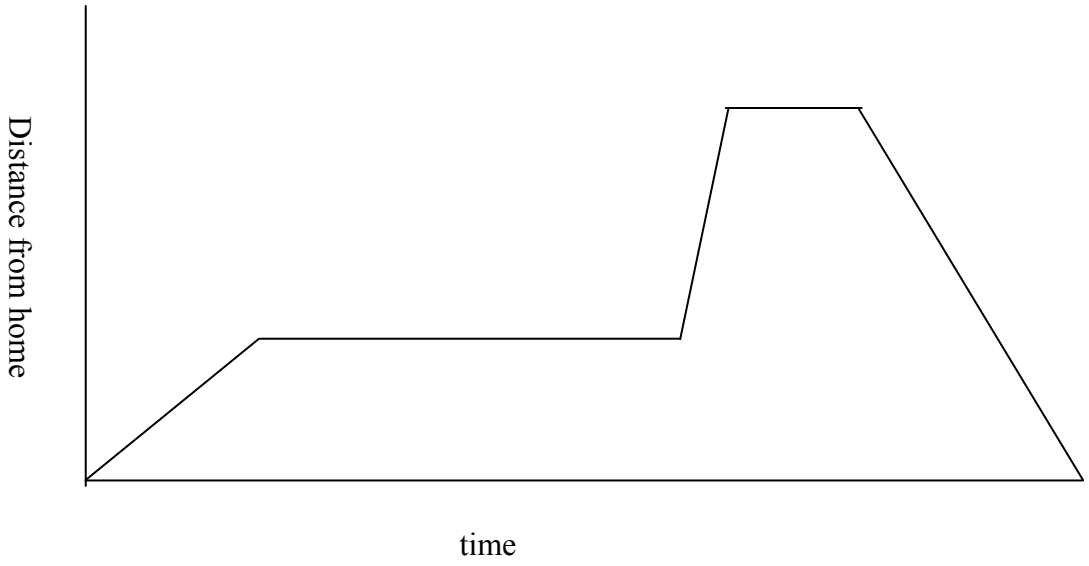
   Weight is the force of gravity on an object and mass is an intrinsic property of matter, however, when mass increases, weight (of the force of the gravitational pull on the object) also increases. The inverse is also true, when mass is decreased, weight is also decreased for an object.

Example 1: Moving Car

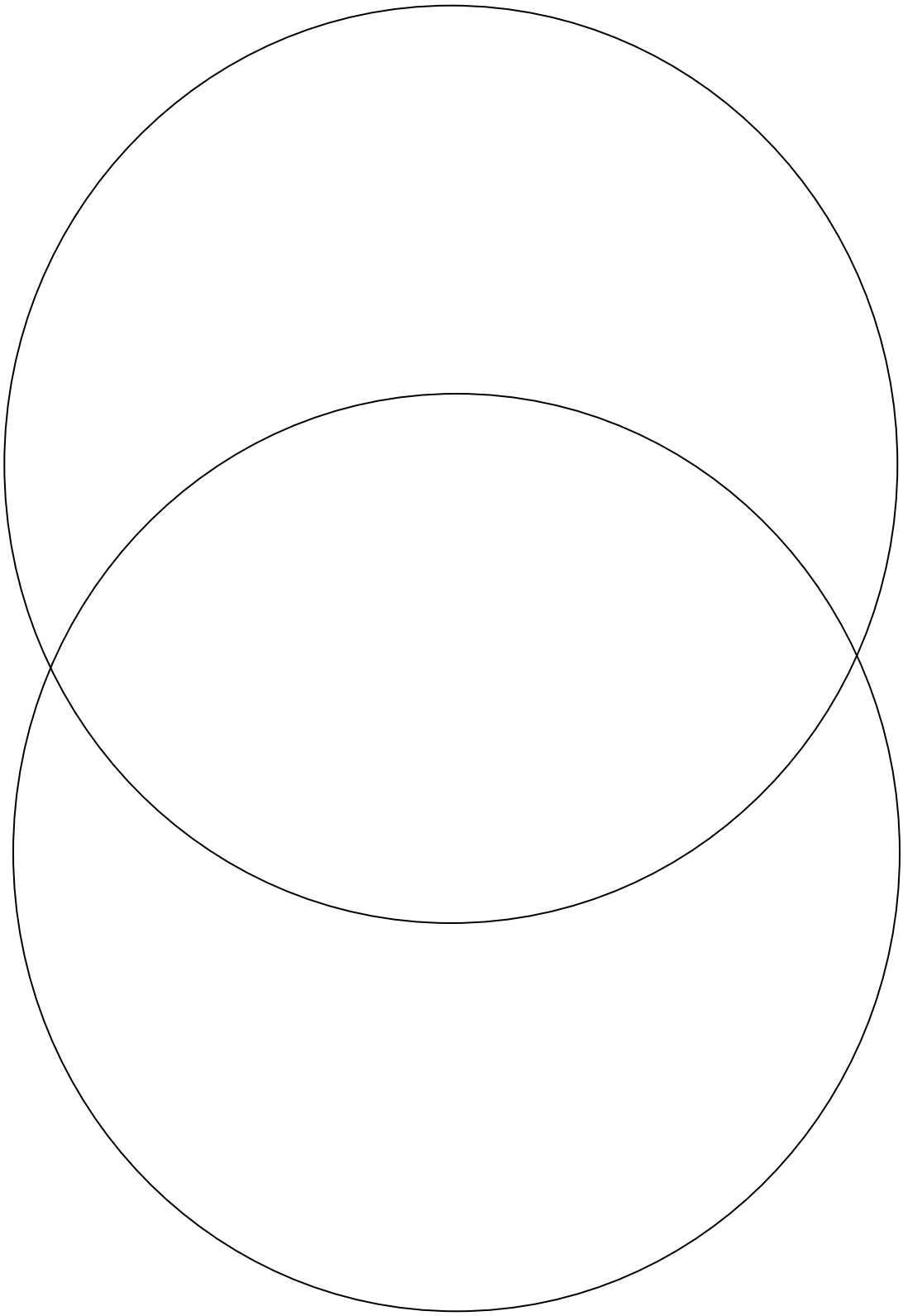


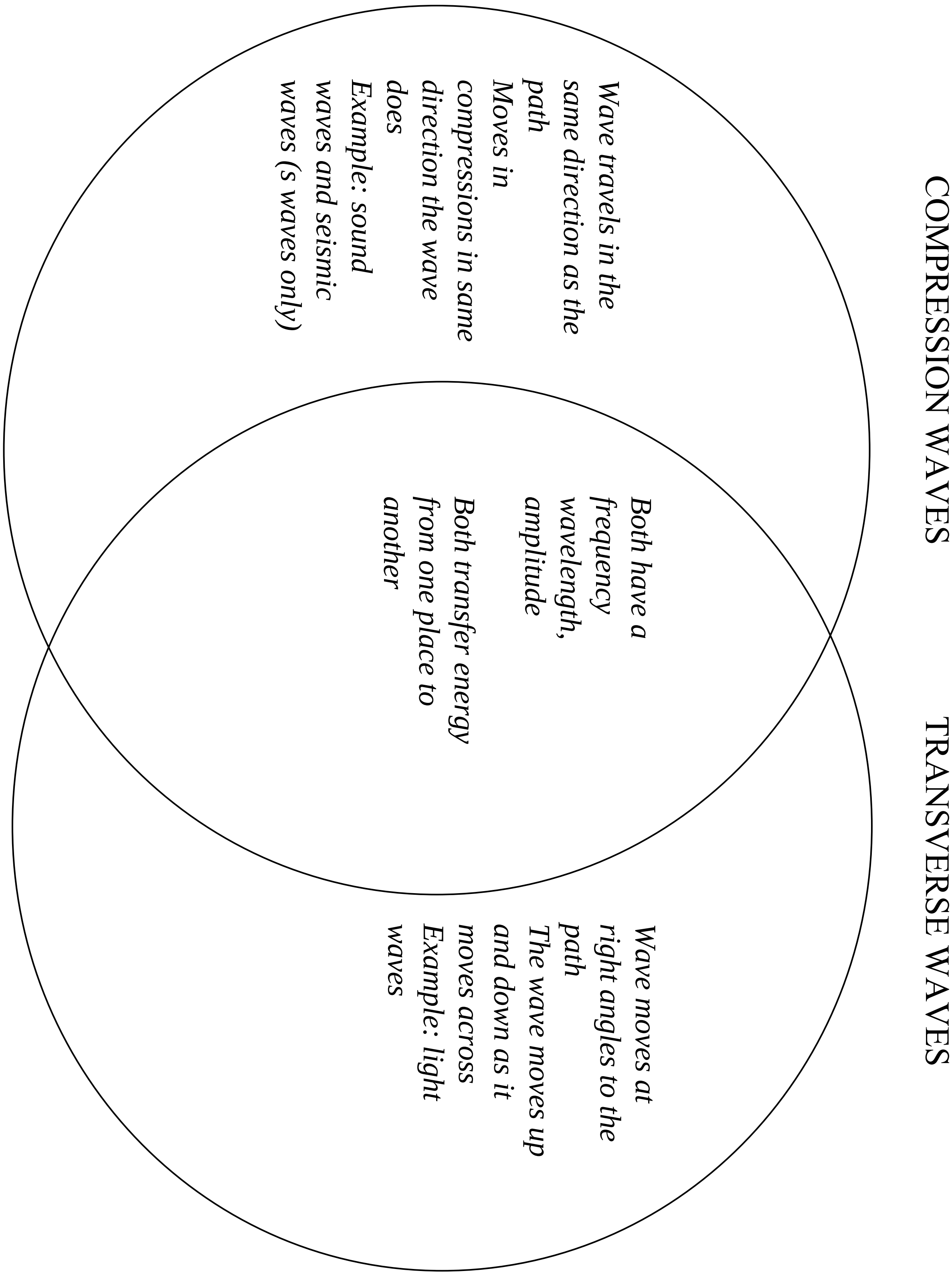
One interpretation of graph: A car accelerated and then traveled at the same speed for a while, until decelerating and coming to a quick stop. The car then accelerated at a faster rate than before and then traveled at the same speed (higher than before) for a distance.

Example 2: Dog walking



One interpretation of graph: A dog walked down the street and sat on the corner. He saw a cat and chased it up a tree in the neighbor's yard. He sat there barking at the cat and then returned home.


COMPRESSION WAVES
TRANSVERSE WAVES


COMPRESSION WAVES
TRANSVERSE WAVES
Wave travels in the same direction as the path
Moves in compressions in same direction the wave does
Example: sound waves and seismic waves (s waves only)
Both have a frequency wavelength, amplitude
Both transfer energy from one place to another
Wave moves at right angles to the path
The wave moves up and down as it moves across
Example: light waves

What are your opinions about Radiation?

Directions: After each statement, write SA (strongly agree), A (agree), D (disagree), or SD (strongly disagree). Then in the space provided, briefly explain the reasons for your opinions.

1. All radiation is bad for humans. _____

Your reasons:

2. X-Rays are the only form of radiation helpful to humans. _____

Your reasons:

3. Radiation travels in the form of waves. _____

Your reasons:

4. Electromagnetic radiation can be divided into two groups, ionizing and non-ionizing radiation. _____

Your reasons:

5. UV rays do not hurt you as long as you wear sunscreen. _____

   Your reasons:

6. The only product that utilizes microwave radiation is a microwave oven. _____

   Your reasons:

7. Those red lights used at fast food restaurants to keep food warm are really just lamps with red visible light. _____

   Your reasons:

8. The frequency of the radio waves is important because it determines who gets to use it for communicating. _____

   Your reasons:

9. Gamma Rays cause the most death and sickness with atomic weapons, and they have no positive uses for humans. _____

   Your reason

Unit 7, Activity 4, Measuring Visible Light

In this activity, you will work with your group to measure the various wavelengths of visible light emitted from the fluorescent lights in the classroom. You will use a spectrometer, an optical instrument used to study and measure properties of light over a specific area of the electromagnetic spectrum, for this measurement. The spectrometer separates the white light into its component wavelengths so you can view and measure their frequencies.

Procedure:

1. Using the spectrometer, take turns looking at the spectrum from the fluorescent light.
2. Record the wavelength at the center of the bright band of each color in the chart below. Read from the scale on the spectrometer and record to the nearest tenth of a nanometer
3. Convert the wavelength measured in nanometers to meters.
4. Calculate the frequency in hertz using the following formulas:

   C (m/s) = f (frequency in Hertz (HZ)) X λ (wavelength in meters (m))

   C (speed of light) = 3.00×10^8 m/s (meters per second)

   f (HZ) = 3.00×10^8 m/s / λ (m)

4. (Optional): Calculate the percent error for the wavelength of each color by comparing their calculated values to the accepted values that are given in the Electromagnetic Spectrum Chart.
5. (Optional): Calculate the percent error using the following formula (note nanometers (nm) must be converted to meters (m) for the frequency calculations):

$$\text{Percent Error} = \frac{\text{accepted value (m) - calculated value (m)}}{\text{accepted value (m)}} \text{ X } 100$$

DATA TABLE

Color of fluorescent light	Spectrometer reading to nearest nm	Wavelength (λ) in nanometers	Wavelength (λ) in meters	Frequency (Hz) $f = c / \lambda$	Percent Error
red					
orange					
yellow					
blue					
green					
indigo					
violet					

Analysis Questions:

1. Why might your observed wavelength be different to the accepted values of the wavelengths of the various colors of the visible spectrum?

2. What did you notice about the frequency of the colors of the spectrum as the wavelength changed?

3. Why did you see different colors through the spectroscope when the fluorescent light is white?

SOUND KWL

K What I Know	W What I Want to Know	L What I Learned

Unit 8, Activity 1, GIST Example for Teacher

Example of a paragraph about current electricity:

Electricity that we use everyday involves the continuous motion of electric charges. A path created for electric charges to flow is referred to as a circuit, and the actual flow of charges is known as an electric current. When electric current flows in a circuit with resistance, it does work. Devices convert this work into many useful forms, such as heat (electric heaters), light (light bulbs), motion (electric motors), and sound (loudspeaker). Electricity can be produced by generation at power plants or from storage from various types of batteries.

First Sentence Gist:
Useful electricity that we use everyday involves the continuous motion of electric charges.
Useful electricity for everyday use involves the continuous motion of electric charges ____ ____ ____

Second Sentence Gist:
Useful electricity that we use everyday involves the continuous motion of electric charges. A path created for electric charges to flow is referred to as a circuit, and the actual flow of charges is known as an electric current.
Current is the continuous flow of electric charges; the path they follow is a circuit.

Third Sentence Gist:
Useful electricity that we use everyday involves the continuous motion of electric charges. A path created for electric charges to flow is referred to as a circuit, and the actual flow of charges is known as an electric current. When electric current flows in a circuit with resistance, it does work
Flowing electrical current through a circuit with resistance produces work. ____ ____ ____ ____ ____

Fourth Sentence Gist:
Useful electricity that we use everyday involves the continuous motion of electric charges. A path created for electric charges to flow is referred to as a circuit, and the actual flow of charges is known as an electric current. When electric current flows in a circuit with resistance, it does work. Devices convert this work into many useful forms, such as heat (electric heaters), light (light bulbs), motion (electric motors) and sound (loudspeaker).
Flowing electrical current through a circuit with resistance produces work that runs different electrical devices.

Fifth Sentence Gist:
Useful electricity that we use everyday involves the continuous motion of electric charges. A path created for electric charges to flow is referred to as a circuit, and the actual flow of charges is known as an electric current. When electric current flows in a circuit with resistance, it does work. Devices convert this work into many useful forms, such as heat (electric heaters), light (light bulbs), motion (electric motors) and sound (loudspeaker). Electricity can be produced by generation at power plants or from storage from various types of batteries.
Electric current from power plants or batteries does work when it flows through devices' circuits.

Continue this process with the next paragraph. The final result will be one *GIST* sentence (or summary) for every paragraph of text read (or for every 3-5 sentences).