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Food Web Example

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BECPO Levels of Organization

Relationships in Ecosystems

Ecology Vocabulary

Natural Resources Graphic Organizer

Mosa Mack Climate Change Vocab

Ecology Warm Ups

Convection Current Lab

Layers of Earth Notes

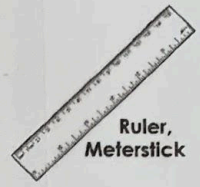
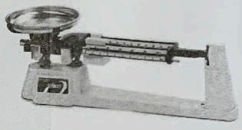
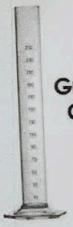
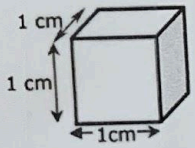
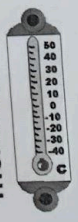
Plate Boundaries Notes

Metric System Sort

Name_____

Metric System Sort

Match the scientific measure with its description, main unit and tool used to measure it.

Measure	Description	Main Unit	Tool
LENGTH	The distance from one point to another.	Meters	 Ruler, Meterstick
MASS	The amount of matter in an object.	Grams	Balance 
LIQUID VOLUME	The amount of space something takes up.	Liters	 Graduated Cylinder
SOLID VOLUME	The amount of space an object with measureable sides takes up.	Cubic Meters	 Volume = 1 cm^3
TEMP-ERATURE	The amount of heat in an object or substance	°Celsius	Thermometer 

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Measuring Length Notes

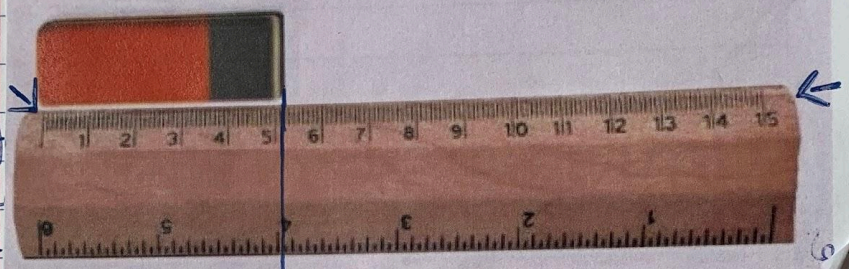
Measuring Length

⑤ Convert if needed

④ Record

① Use the metric side of the ruler

52 mm = 5.2 cm



② line the object up to the zero mark

③ measure to the nearest mm.

Examples

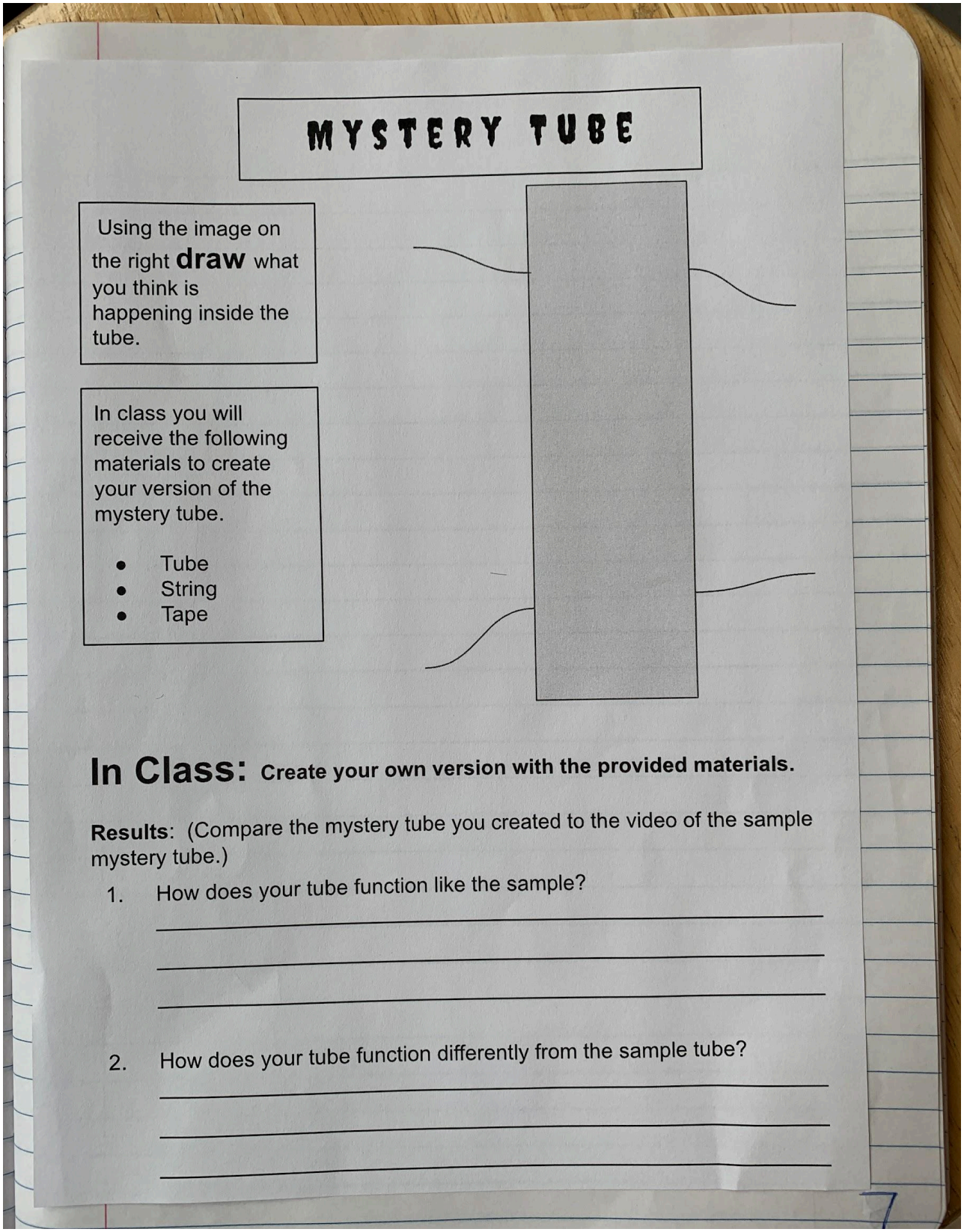
Paper Clip	33 mm	3.3 cm
Expo Marker	120 mm	12.0 cm

- Glue stick
- Scissors
- Calculator
- Colored Pencils
- highlighters
- Red Pen

pick 3

6

Mystery Tube



MYSTERY TUBE

Using the image on the right **draw** what you think is happening inside the tube.

In class you will receive the following materials to create your version of the mystery tube.

- Tube
- String
- Tape

In Class: **Create your own version with the provided materials.**

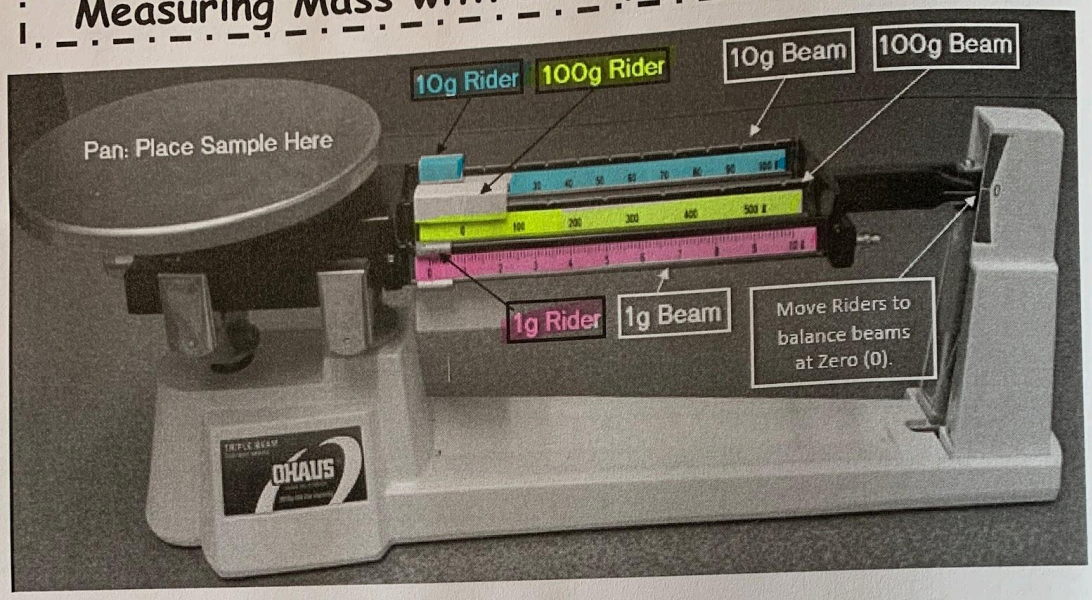
Results: (Compare the mystery tube you created to the video of the sample mystery tube.)

1. How does your tube function like the sample?

2. How does your tube function differently from the sample tube?

Measuring Mass = Triple Beam Balance

Measuring Mass with a Triple Beam Balance

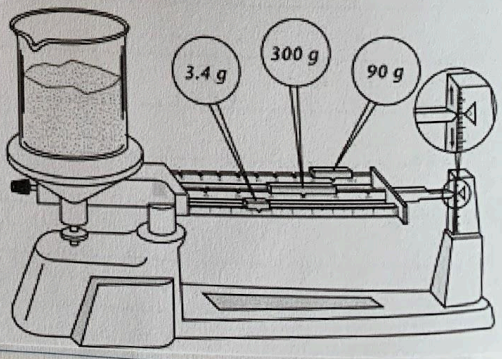


How to Use:

1. **Zero the balance**: Move all the riders to zero and remove all objects from the pan. The pointer should line up with the ZERO.
2. Add object to the center of the pan.
3. Start by moving the 100 gram rider (yellow) one notch at a time, until the pointer sinks below the zero. Then move the rider back to the left one notch.
4. Repeat step 3 using the 10 gram rider (blue).
5. Slowly move the 1 gram rider (pink) until the point lines up with zero.
6. Add the value of each beam to find the mass of the object.

Practice

Add up the riders for the total mass.



300
+ 90
3.4
393.4

= 393.4 g

8

Liquid Volume

Liquid Volume

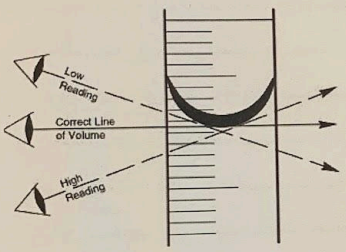
Using a Graduated Cylinder (GC)

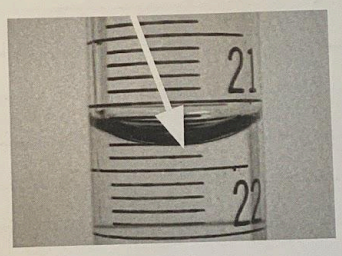
1. Make sure the graduated cylinder is on a flat surface.

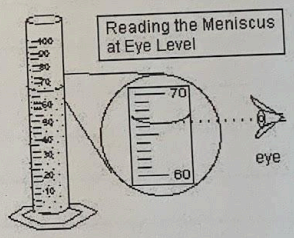
2. Determine the **scale** of the GC. What is each graduation **line** equal to?
(Common graduations: 0.1mL, 0.2 mL, 0.5 mL, 1 mL, 2mL, 5 mL, 10 mL, 20 mL)

3. You must be at eye level with the fluid level to take an accurate reading.

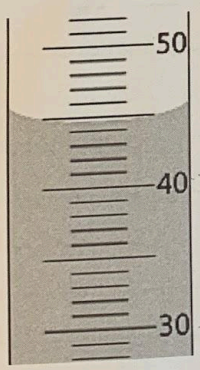
4. Take your measurement using the bottom of the meniscus.





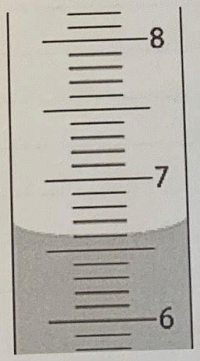


Graduated Cylinder Practice



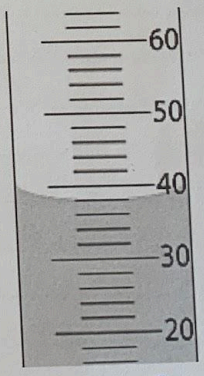
Each line is = 1 mL

Volume = 45 mL



Each line is = 0.1 mL

Volume = 6.6 mL



Each line is = 2 mL

Volume = 38 mL

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Solid Volume

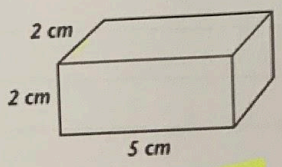
Measuring: Solid Volume (regular shape)

You can use metric measurements to find the volume of a regularly shaped solid object by multiplying the length by width by height.

Volume = L x W x H

Labels: cm^3 or cubic centimeters (cc)

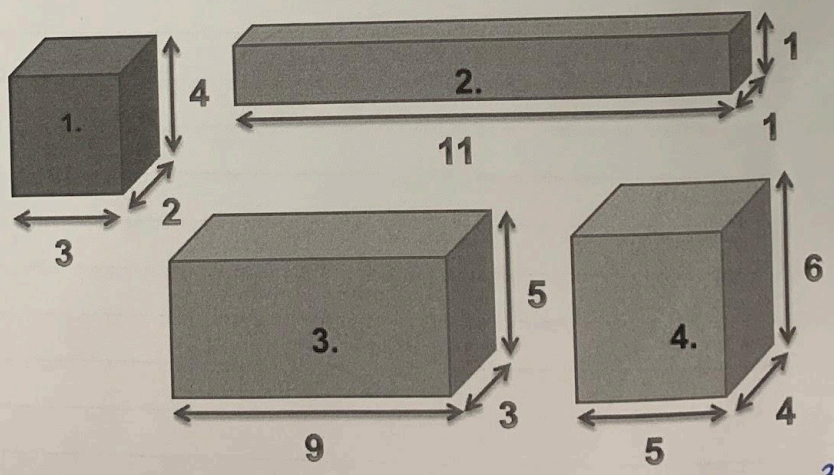
Example:



Volume = 5 cm × 2 cm × 2 cm = 20 cm^3

Practice

Calculate the volume for each solid shape below. The unit for each measurement is cm.



1. $3 \times 2 \times 4 = 24\ cm^3$
2. $11 \times 1 \times 1 = 11\ cm^3$
3. $9 \times 3 \times 5 = 135\ cm^3$
4. $5 \times 4 \times 6 = 120\ cm^3$

Labs and Warm-Ups

Name: Key

Liquid Volume La

Color	Volume
Red	75
Orange	7
Yellow	42
Green	146
Blue	380
Purple	17

he lines below. Match the letter of the line to the
nents listed on the right hand side.

4.5 cm	D
1 cm	F
17 mm	C
67 mm	A
10.2 cm	E
42 mm	B

Name: _____

TBB Practice

Item	Mass (g)
Dice	
Calculator	
Wooden Spool	
Text Book	
Tissue Box	
Battery	

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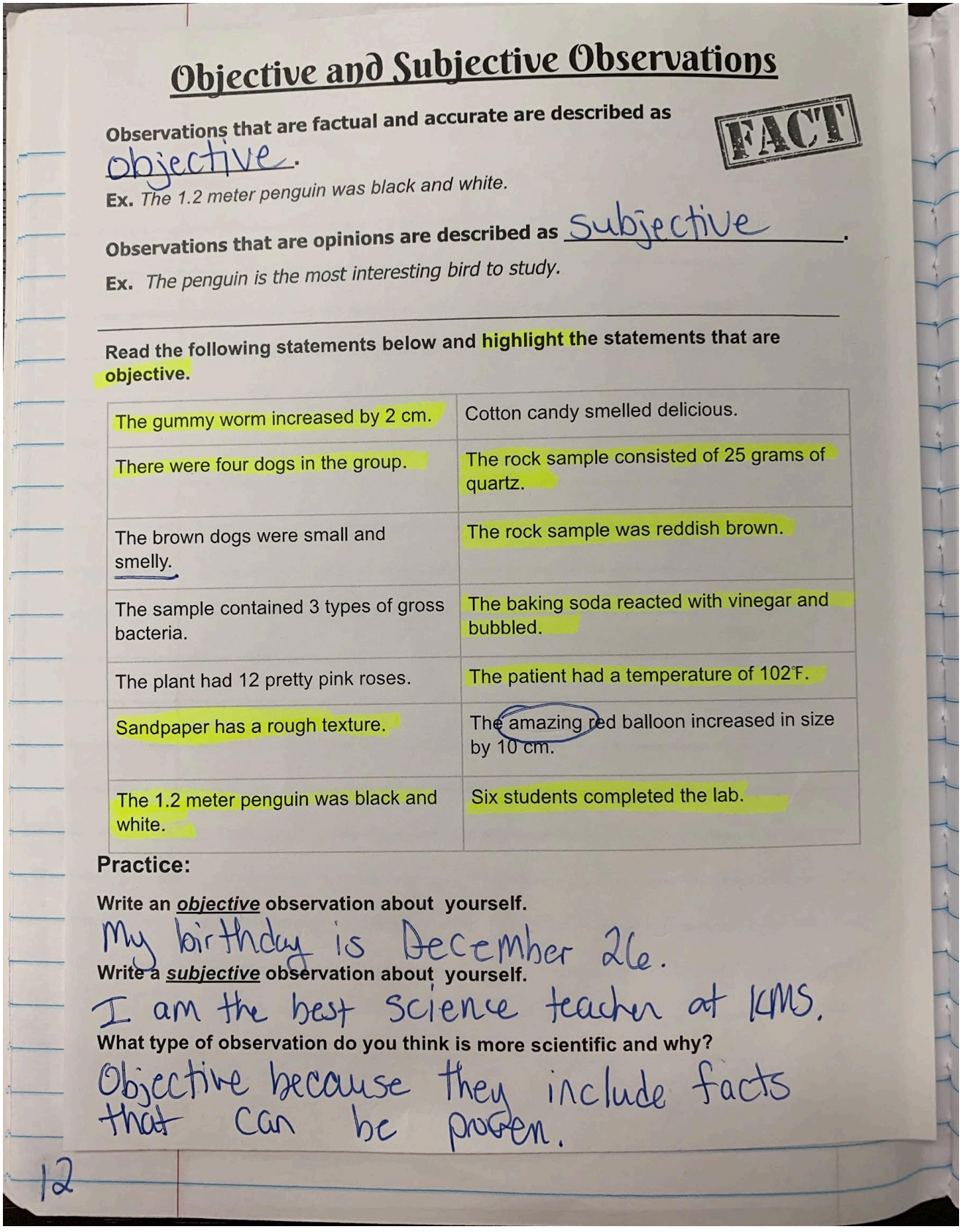
Objective and Subjective Observations



Objective and Subjective Observations

Observations that are factual and accurate are described as objective.

FACT

Ex. *The 1.2 meter penguin was black and white.*

Observations that are opinions are described as subjective.

Ex. *The penguin is the most interesting bird to study.*

Read the following statements below and highlight the statements that are objective.

The gummy worm increased by 2 cm.	Cotton candy smelled delicious.
There were four dogs in the group.	The rock sample consisted of 25 grams of quartz.
The brown dogs were small and smelly.	The rock sample was reddish brown.
The sample contained 3 types of gross bacteria.	The baking soda reacted with vinegar and bubbled.
The plant had 12 pretty pink roses.	The patient had a temperature of 102°F.
Sandpaper has a rough texture.	The amazing red balloon increased in size by 10 cm.
The 1.2 meter penguin was black and white.	Six students completed the lab.

Practice:

Write an *objective* observation about yourself.

My birthday is December 26.

Write a *subjective* observation about yourself.

I am the best science teacher at KMS.

What type of observation do you think is more scientific and why?

Objective because they include facts that can be proven.

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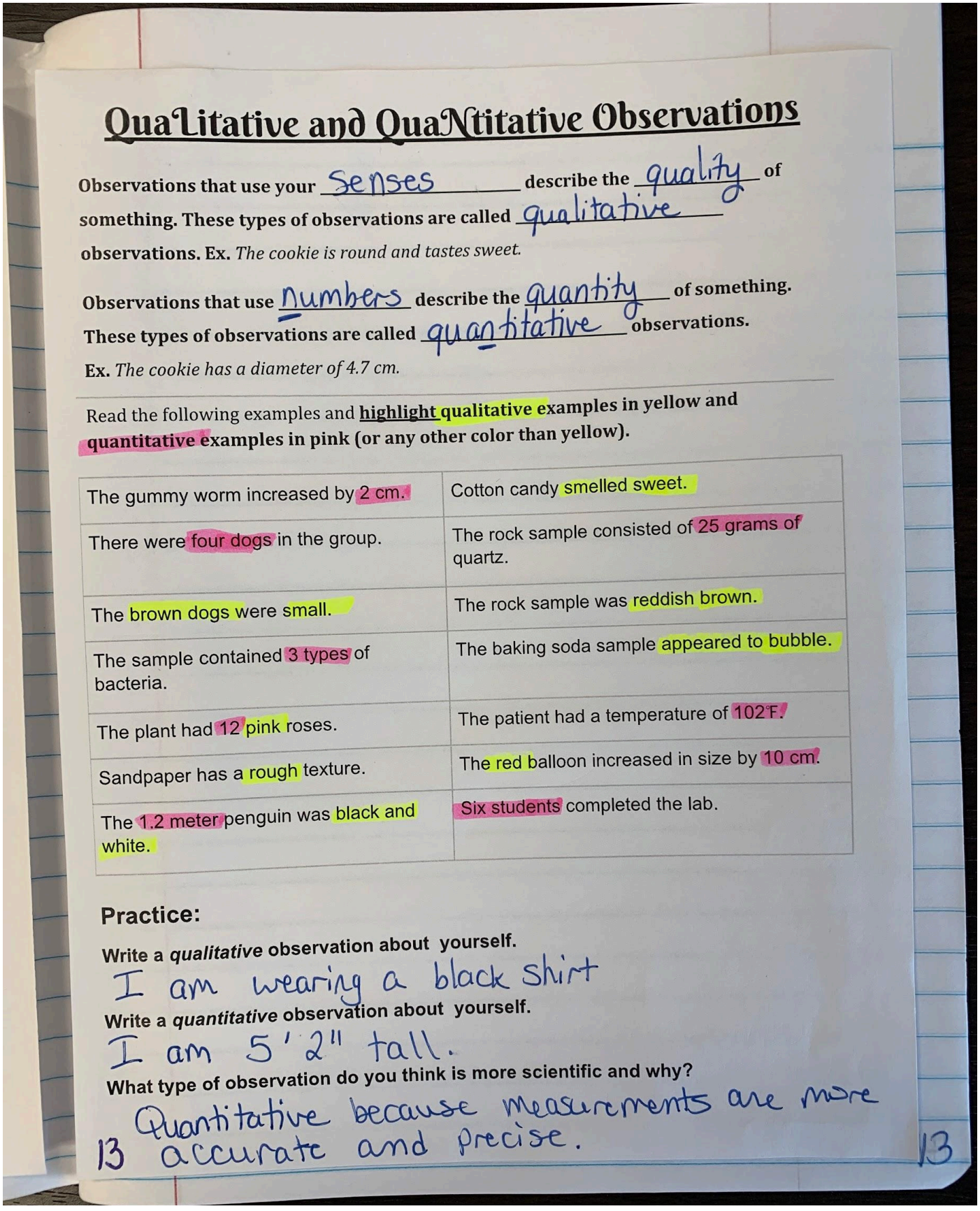
Qualitative and Quantitative Observations



QuaLitative and QuaNtitative Observations

Observations that use your Senses **describe the** quality **of something. These types of observations are called** qualitative **observations. Ex.** *The cookie is round and tastes sweet.*

Observations that use numbers **describe the** quantity **of something. These types of observations are called** quantitative **observations.**

Ex. *The cookie has a diameter of 4.7 cm.*

Read the following examples and **highlight qualitative examples in yellow and quantitative examples in pink (or any other color than yellow).**

The gummy worm increased by 2 cm.	Cotton candy smelled sweet.
There were four dogs in the group.	The rock sample consisted of 25 grams of quartz.
The brown dogs were small.	The rock sample was reddish brown.
The sample contained 3 types of bacteria.	The baking soda sample appeared to bubble.
The plant had 12 pink roses.	The patient had a temperature of 102°F.
Sandpaper has a rough texture.	The red balloon increased in size by 10 cm.
The 1.2 meter penguin was black and white.	Six students completed the lab.

Practice:

Write a *qualitative* observation about yourself.

I am wearing a black shirt

Write a *quantitative* observation about yourself.

I am 5'2" tall.

What type of observation do you think is more scientific and why?

Quantitative because measurements are more accurate and precise.

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Inferences

Making Inferences

An **inference** is a logical conclusion drawn from available evidence and prior knowledge. Inferences are often made from observations. They are attempts to explain the things we see. The more prior knowledge you have, the better your inferences. When making inferences, be sure to look at all of the available evidence and combine it with what you already know.

1. A young child feels the wind blowing and sees the trees swaying back and forth. She infers that the movement of the trees is causing the wind. What prior knowledge does she probably lack?

   She doesn't understand that it is the wind causing the trees to move.

2. Write the available evidence, your prior knowledge, and several inferences beside each of the following diagrams.

Observations: The nest is on the ground. One egg is broken, Racoon is sitting

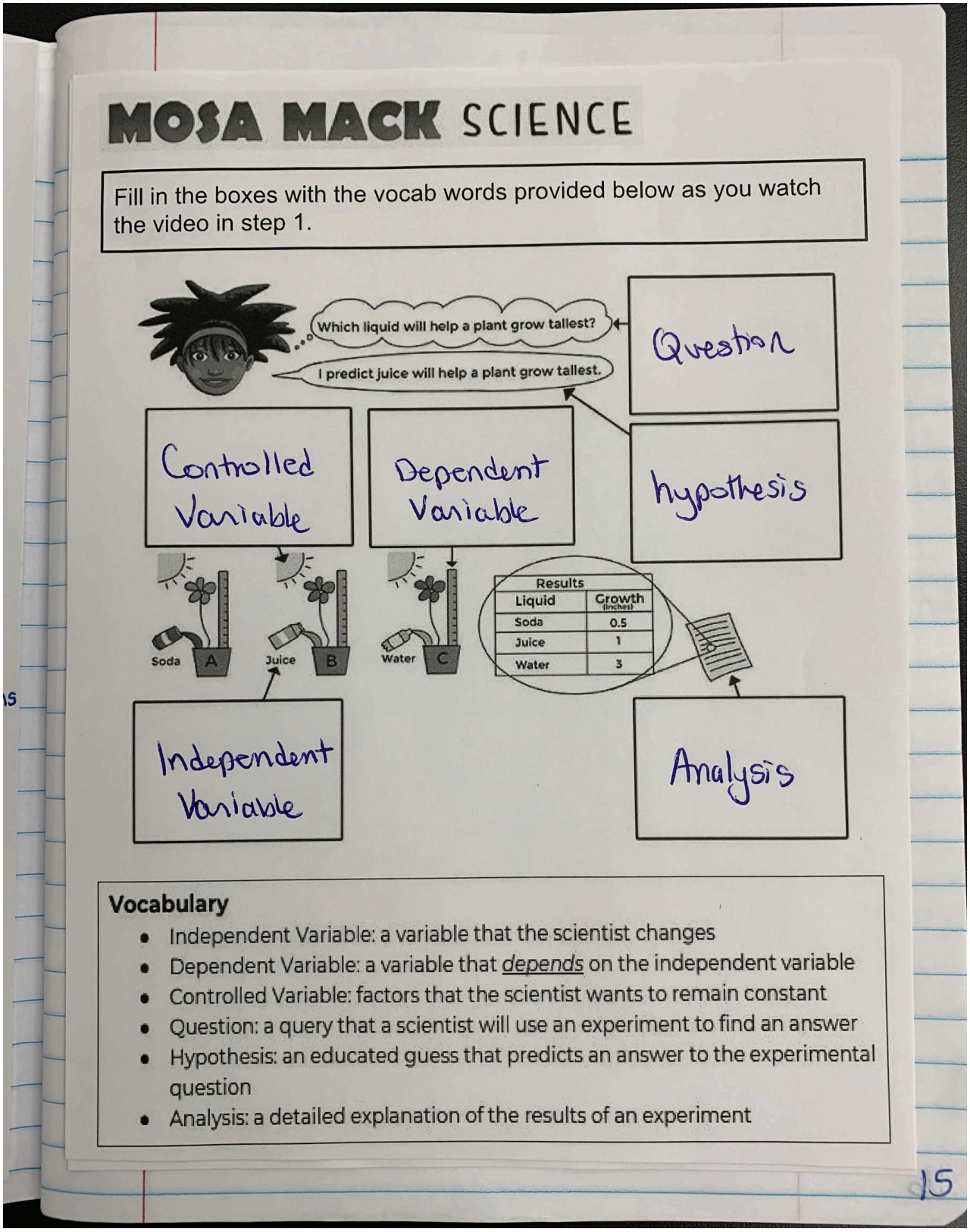
Prior knowledge: Eggs are in nests in trees. Racoons are scavengers Birds are protective of eggs

Inferences: Nest fell out of the tree and Racoon ate the eggs

A = Observation B = Prior knowledge C = Inference

1. A	6. C	11. A	16. C	21. C
2. B	7. B	12. B	17. A	22. C
3. C	8. C	13. A	18. C	23. C
4. C	9. B	14. C	19. B	24. B
5. A	10. C	15. C	20. C	25. A

Mosa Mack Claims, Evidence and Reasoning



MOSA MACK SCIENCE

Fill in the boxes with the vocab words provided below as you watch the video in step 1.

Vocabulary

- Independent Variable: a variable that the scientist changes
- Dependent Variable: a variable that *depends* on the independent variable
- Controlled Variable: factors that the scientist wants to remain constant
- Question: a query that a scientist will use an experiment to find an answer
- Hypothesis: an educated guess that predicts an answer to the experimental question
- Analysis: a detailed explanation of the results of an experiment

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Variables

~Variables~

	Independent	Dependent	Control	Constants
Notes	Variable that I change in the experiment	Variable that is measured	Baseline for Comparison No IV	Everything that needs to stay the same
Ask?	What am I changing on purpose? (I change the IV) If...	What I am measuring or observing in response to the change of IV? Then...	What is my baseline for comparison? (take away the IV) 0, no or without	What factors should be kept the same so that only the IV is what is changed on purpose?

PRACTICE: Determine the variables in each hypothesis below.

If the angle of the ramp is increased, then the car's speed will increase because the higher the incline the more potential energy the car has.

D	1. Independent	A. Car Speed DV
B	2.Control	B. A ramp with 0° angle Control
A	3. Dependent	C. the car Constant
C	4. Constant	D. the angle of the ramp IV

If the amount of salt in the water is increased, then the number of objects that float will increase, because the water's density would be heavier.

D	5. Independent	A. number of objects that float
C	6. Control	B. amount of water
A	7. Dependent	C. water without salt
B	8. Constant	D. amount of salt

If the amount of sugar in gum is increased, then the size of bubble will decrease because sugar makes the gum heavy.

C	9. Size of bubble	A. Independent Variable
D	10. Person chewing	B. Control
A	11. Amount of sugar	C. Dependent Variable
B	12. Gum with 0g of sugar	D. Constant

If the amount of air in the bouncy ball is increased, then the height the ball bounces will increase because the higher the air pressure the higher the ball will bounce.

D	13. Height the ball is dropped	A. Independent Variable
B	14. Ball with 0 air	B. Control
A	15. Amount of air in the ball	C. Dependent Variable
C	16. Height of bounce	D. Constant

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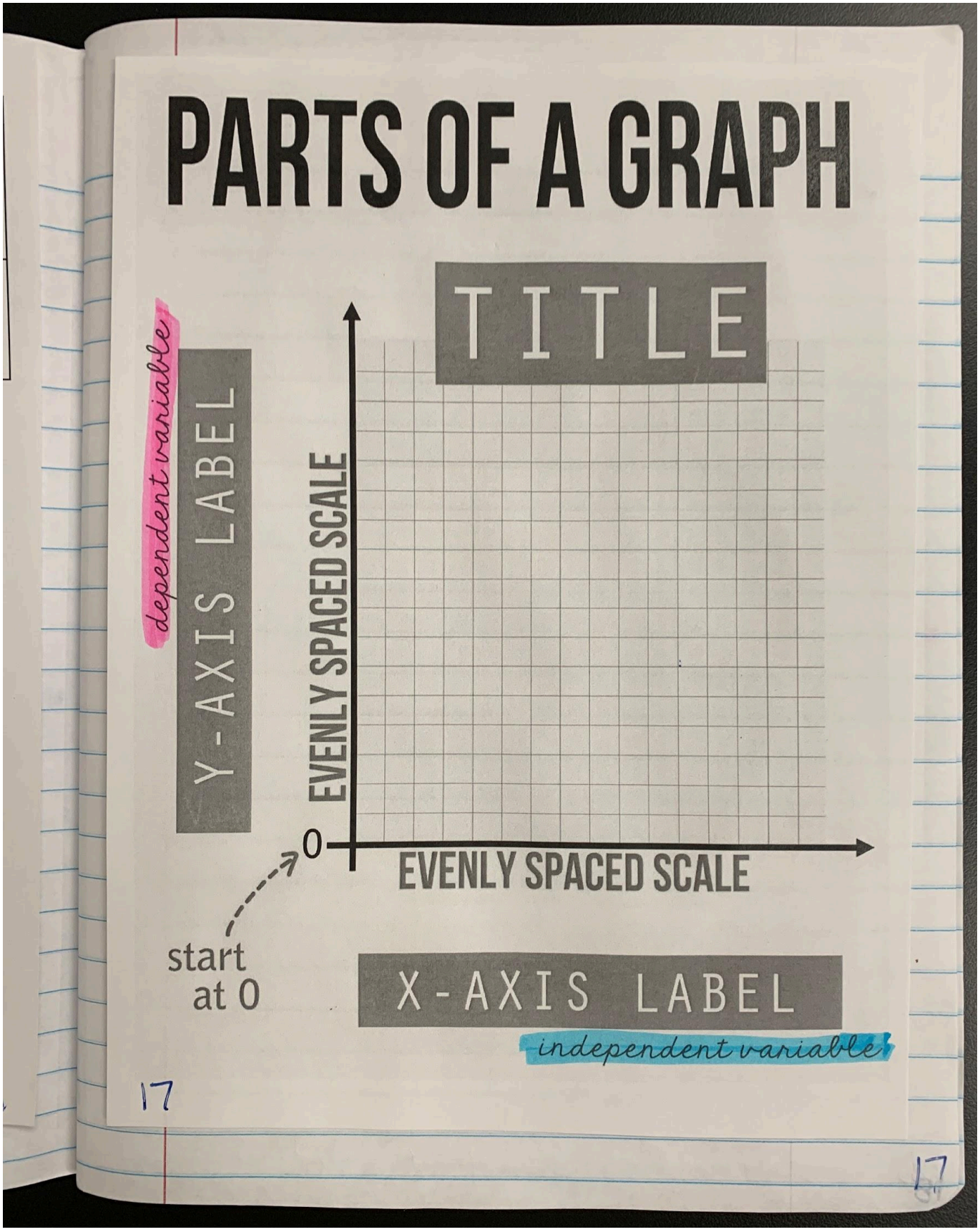
Graphing Diagram



Qualitative Graphing (Bar Graph)

Qualitative Graphing - BAR GRAPH

IV: Type of Ball

DV: Height of Bounce (cm)

1A

Vrite a Hypothesis: *If the IV is (increased, decreased or **changed**), then the DV will (increase, decrease) because...*

If the type of ball is changed, then height of bounce will decrease because we observed the golf ball with a higher bounce.

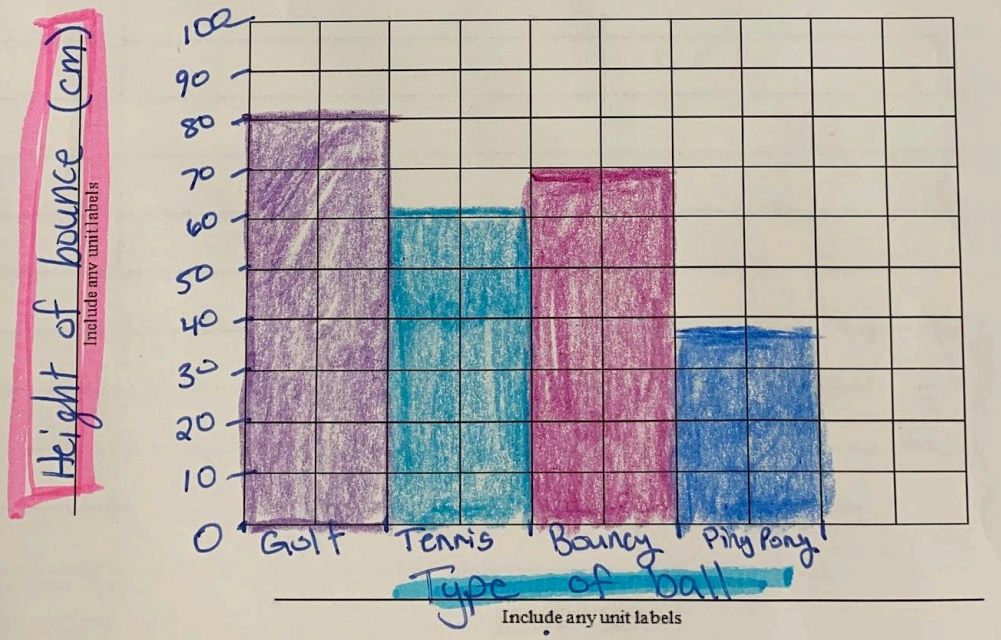
Qualitative Data (words) = Bar Graph
Quantitative Data (numbers) = line Graph

IV: Type of Ball	DV: Height of bounce (cm)			
	Trial 1	Trial 2	Trial 3	Average
Golf	83	75	83	80.3
Tennis	62	62	63	62.3
Bouncy	68	69	70	69
Ping Pong	50	36	30	38.6

Average: add each row together and divide by 3

The effect of type of ball on height of bounce cm

Title needs to follow the correct format: The Effect of IV on DV



18

18

Quantitative Graping (Line Graph)

Quantitative Graphing

1A

IV: Height of ~~bounce~~ Drop (cm)

DV: Height of Bounce (cm)

Write a Hypothesis: *If the IV is (**increased, decreased** or changed), then the DV will (increase, decrease) because...*

If height of drop is increased then the height of bounce will increase because the ball will have more energy.

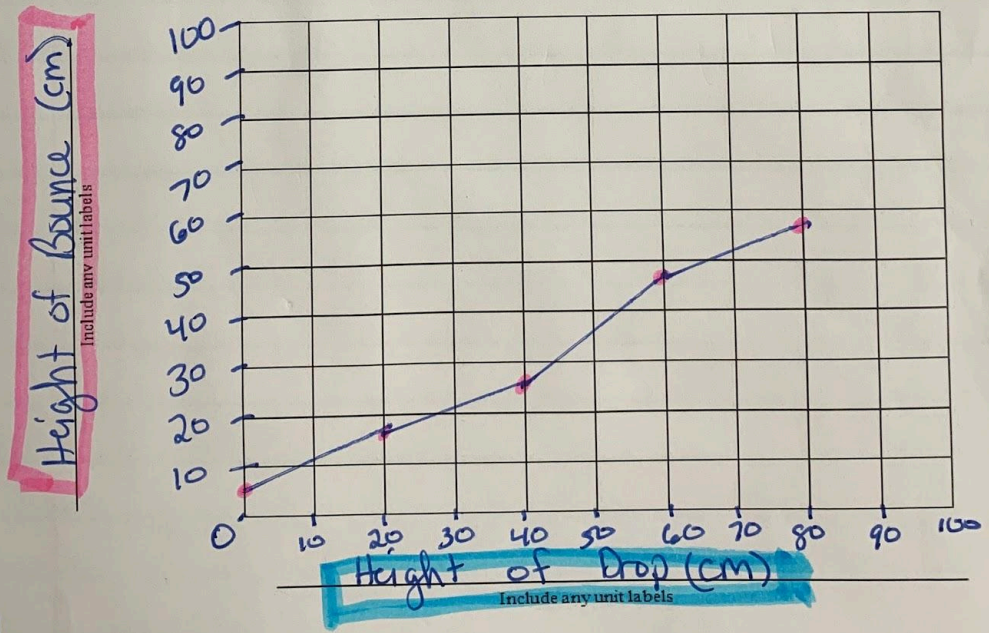
Qualitative Data (words) = Bar Graph
Quantitative Data (numbers) = line Graph

Height of drop (cm)	Height of Bounce (cm)			
	Trial 1	Trial 2	Trial 3	Average
0 control	5	5	5	5
20	17	18	18	17.7
40	22	30	27	26
60	46	50	48	48
80	51	54	59	54.7

Average: Add each row together and divide by 3.

The Effect of Height of Drop on Height of Bounce

Title needs to follow the correct form at: The Effect of IV on DV



19

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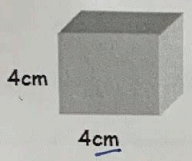
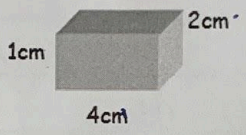
Warm-ups (may vary by teacher)

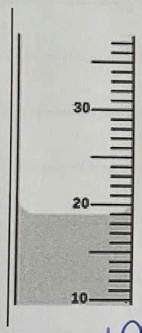
Name: _____

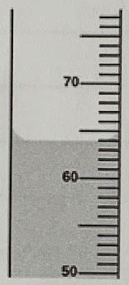
Find the volume. L x W x H





1. $32 cm^3$ 2. $8 cm^3$





3. 19mL 4. 64mL

Observations Name Key

Classify each of the following statements as either qualitative (L) or quantitative (N).

L. Qualitative **N. Quantitative**

1. L Granny Smith apples are green.
2. N The math class was 45 minutes long.
3. N A football field has 100 yards.
4. L The dry autumn leaves crunched under my feet.
5. N The temperature outside was 35° C.

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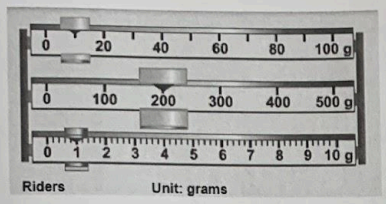
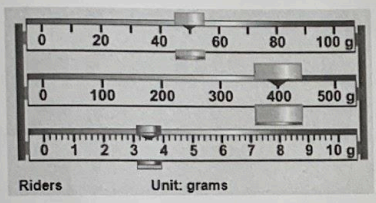
Name: _____

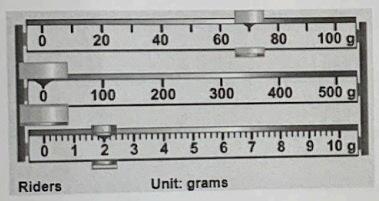
Read the triple beam balance. Write the mass on the line provided next to each image.



211 g



453.6g



72 g

Variables

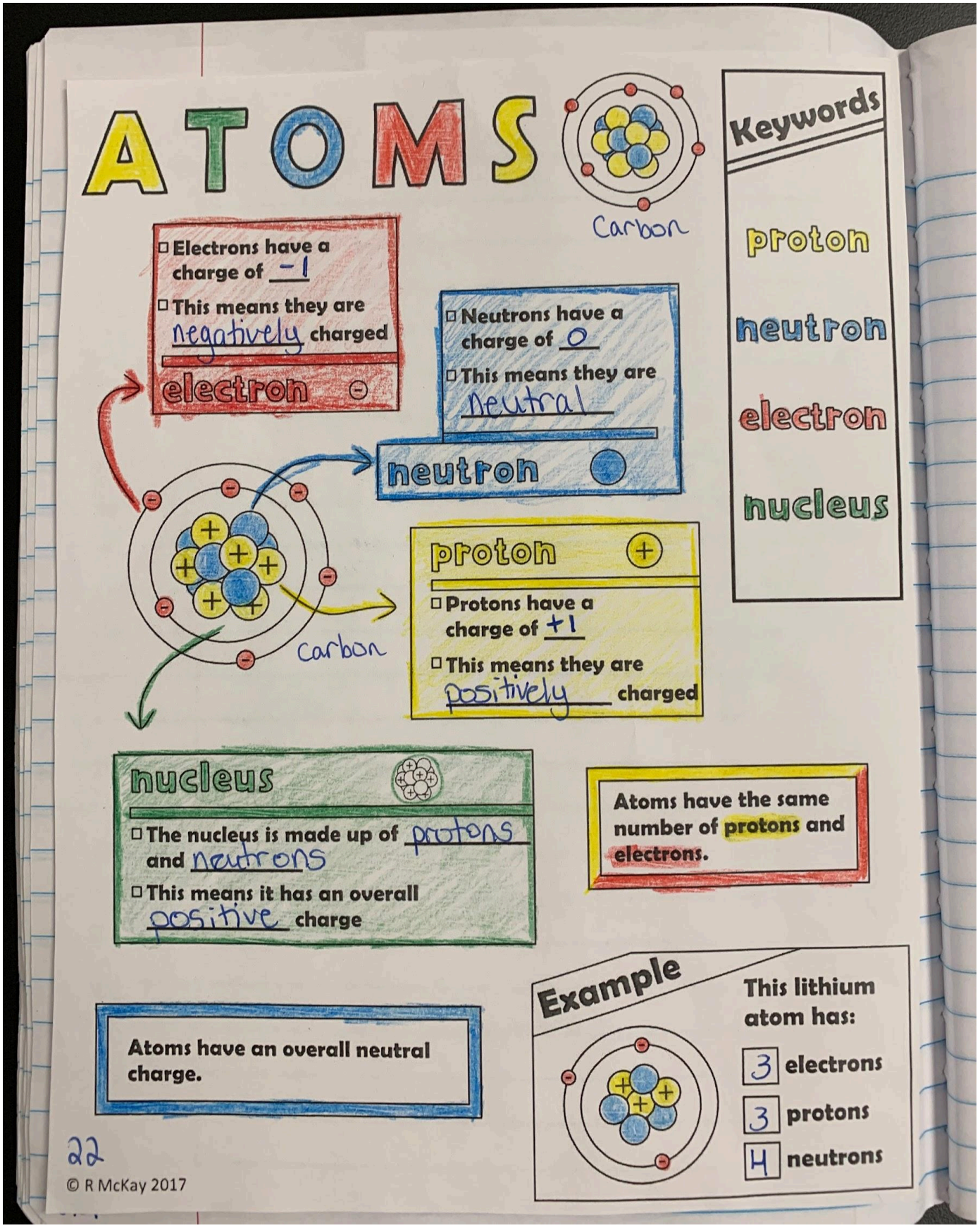
Name: _____

Read the hypothesis below and fill in the answers for each variable listed.

If the amount of graphite is increased on the wheels' axles, then the pinewood derby car will be faster because graphite reduces friction allowing the wheels to spin faster.

1. Independent variable: Amount of graphite
2. Dependent variable: Speed
3. Control: No Graphite
4. Constant: Car, Axles, Wheels

Atoms Notes


ATOMS
Carbon
Keywords
proton
neutron
electron
nucleus
Electrons have a charge of -1
This means they are negatively charged
electron
Neutrons have a charge of 0
This means they are neutral
neutron
proton
Protons have a charge of +1
This means they are positively charged
Carbon
nucleus
The nucleus is made up of protons and neutrons
This means it has an overall positive charge
Atoms have the same number of protons and electrons.
Atoms have an overall neutral charge.
Example
This lithium atom has:
3 electrons
3 protons
4 neutrons
22
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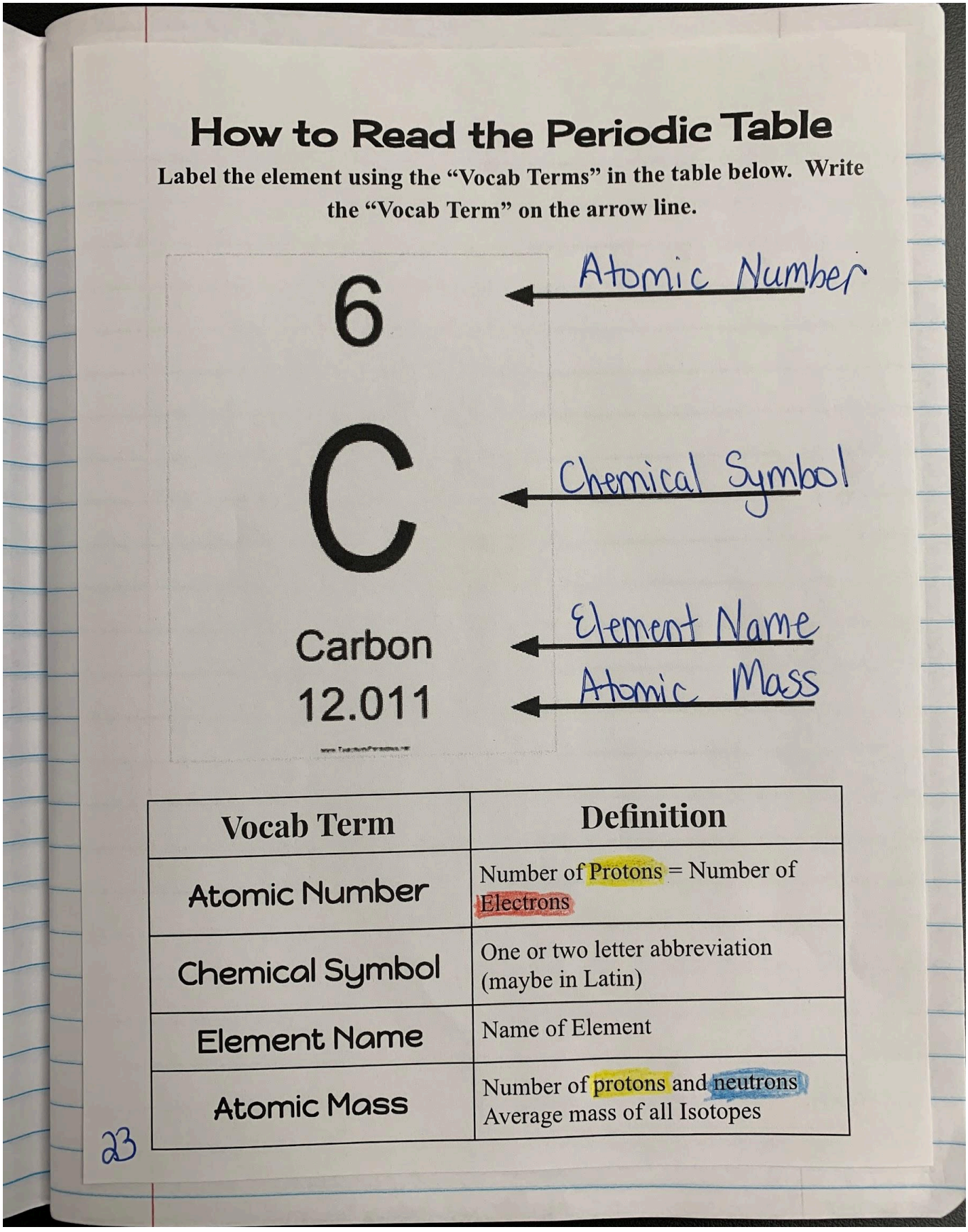
How to Read the Periodic Table



How to Read the Periodic Table

Label the element using the "Vocab Terms" in the table below. Write the "Vocab Term" on the arrow line.

6 ← Atomic Number

C ← Chemical Symbol

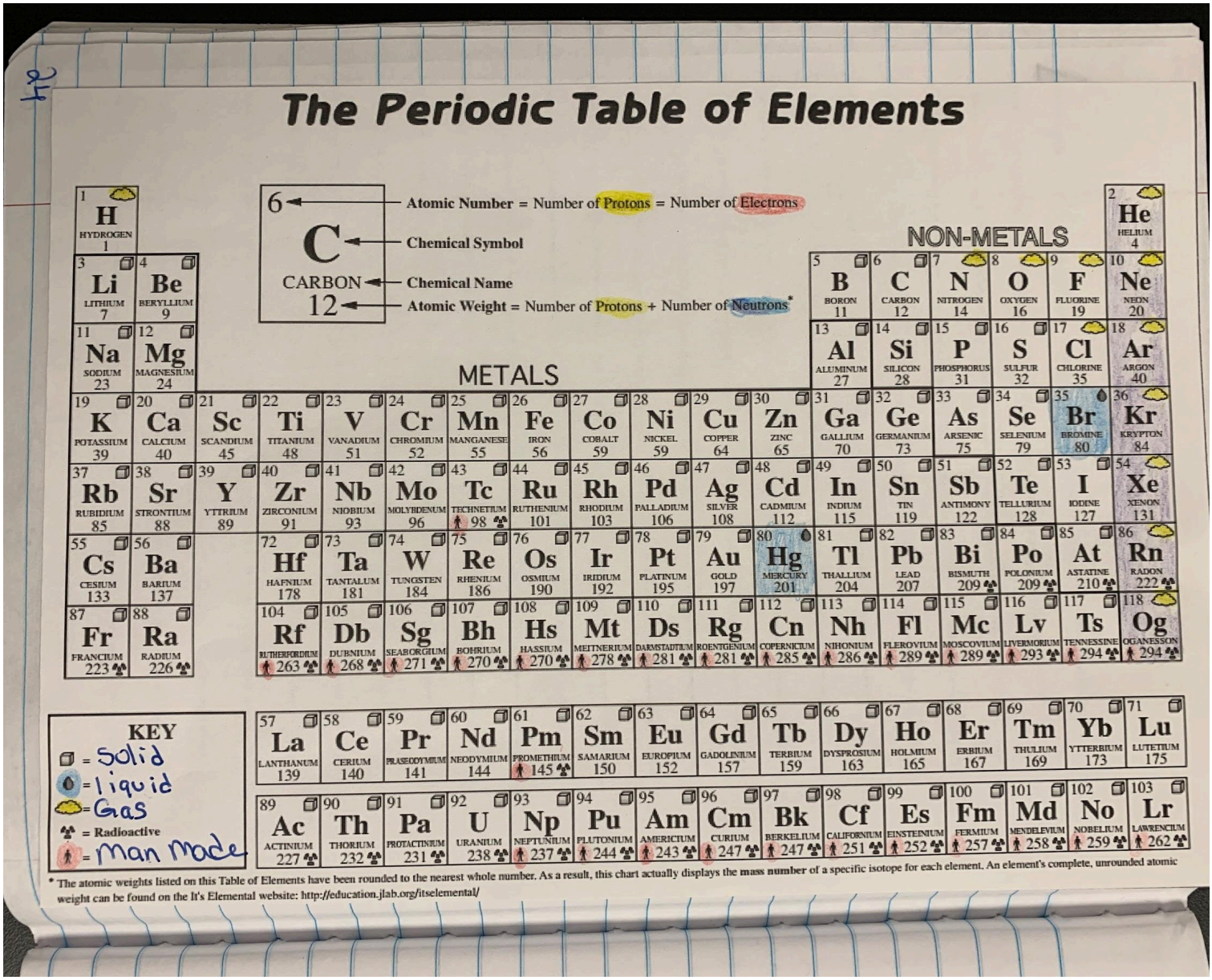
Carbon ← Element Name

12.011 ← Atomic Mass

Vocab Term	Definition
Atomic Number	Number of Protons = Number of Electrons
Chemical Symbol	One or two letter abbreviation (maybe in Latin)
Element Name	Name of Element
Atomic Mass	Number of protons and neutrons Average mass of all Isotopes

23

Periodic Table of Elements



The Periodic Table of Elements

6 — C — CARBON — 12

Atomic Number = Number of Protons = Number of Electrons
Chemical Symbol
Chemical Name
Atomic Weight = Number of Protons + Number of Neutrons*

NON-METALS

METALS

1																	2
H HYDROGEN 1																	He HELIUM 4
3 Li LITHIUM 7	4 Be BERYLLIUM 9											5 B BORON 11	6 C CARBON 12	7 N NITROGEN 14	8 O OXYGEN 16	9 F FLUORINE 19	10 Ne NEON 20
11 Na SODIUM 23	12 Mg MAGNESIUM 24											13 Al ALUMINUM 27	14 Si SILICON 28	15 P PHOSPHORUS 31	16 S SULFUR 32	17 Cl CHLORINE 35	18 Ar ARGON 40
19 K POTASSIUM 39	20 Ca CALCIUM 40	21 Sc SCANDIUM 45	22 Ti TITANIUM 48	23 V VANADIUM 51	24 Cr CHROMIUM 52	25 Mn MANGANESE 55	26 Fe IRON 56	27 Co COBALT 59	28 Ni NICKEL 59	29 Cu COPPER 64	30 Zn ZINC 65	31 Ga GALLIUM 70	32 Ge GERMANIUM 73	33 As ARSENIC 75	34 Se SELENIUM 79	35 Br BROMINE 80	36 Kr KRYPTON 84
37 Rb RUBIDIUM 85	38 Sr STRONTIUM 88	39 Y YTTRIUM 89	40 Zr ZIRCONIUM 91	41 Nb NIOBIUM 93	42 Mo MOLYBDENUM 96	43 Tc TECHNETIUM 98	44 Ru RUTHENIUM 101	45 Rh RHODIUM 103	46 Pd PALLADIUM 106	47 Ag SILVER 108	48 Cd CADMIUM 112	49 In INDIUM 115	50 Sn TIN 119	51 Sb ANTIMONY 122	52 Te TELLURIUM 128	53 I IODINE 127	54 Xe XENON 131
55 Cs CESIUM 133	56 Ba BARIUM 137		72 Hf HAFNIUM 178	73 Ta TANTALUM 181	74 W TUNGSTEN 184	75 Re RHENIUM 186	76 Os OSMIUM 190	77 Ir IRIDIUM 192	78 Pt PLATINUM 195	79 Au GOLD 197	80 Hg MERCURY 201	81 Tl THALLIUM 204	82 Pb LEAD 207	83 Bi BISMUTH 209	84 Po POLONIUM 209	85 At ASTATINE 210	86 Rn RADON 222
87 Fr FRANCIUM 223	88 Ra RADIUM 226		104 Rf RUTHERFORDIUM 263	105 Db DUBNIUM 268	106 Sg SEABORGIUM 271	107 Bh BOHRIUM 270	108 Hs HASSIUM 270	109 Mt MEITNERIUM 278	110 Ds DARMSTADTIUM 281	111 Rg ROENTGENIUM 281	112 Cn COPERNICIUM 285	113 Nh NIHONIUM 286	114 Fl FLEROVIUM 289	115 Mc MOSCOVIUM 289	116 Lv LIVERMORIUM 293	117 Ts TENNESSINE 294	118 Og OGANESSON 294

57 La LANTHANUM 139	58 Ce CERIUM 140	59 Pr PRASEODYMIUM 141	60 Nd NEODYMIUM 144	61 Pm PROMETHIUM 145	62 Sm SAMARIUM 150	63 Eu EUROPIUM 152	64 Gd GADOLINIUM 157	65 Tb TERBIUM 159	66 Dy DYSPROSIUM 163	67 Ho HOLMIUM 165	68 Er ERBIUM 167	69 Tm THULIUM 169	70 Yb YTTERBIUM 173	71 Lu LUTETIUM 175
89 Ac ACTINIUM 227	90 Th THORIUM 232	91 Pa PROTACTINIUM 231	92 U URANIUM 238	93 Np NEPTUNIUM 237	94 Pu PLUTONIUM 244	95 Am AMERICIUM 243	96 Cm CURIUM 247	97 Bk BERKELIUM 247	98 Cf CALIFORNIUM 251	99 Es EINSTEINIUM 252	100 Fm FERMIUM 257	101 Md MENDELEVIUM 258	102 No NOBELIUM 259	103 Lr LAWRENCIUM 262

KEY
- = Solid
- = Liquid
- = Gas
- = Radioactive
- = Man made

* The atomic weights listed on this Table of Elements have been rounded to the nearest whole number. As a result, this chart actually displays the mass number of a specific isotope for each element. An element's complete, unrounded atomic weight can be found on the It's Elemental website: http://education.jlab.org/itselemental/

Physical Properties of Matter

PHYSICAL PROPERTIES OF MATTER

Examples:
Color
Shape
Size
Texture
Mass
Volume

How do you know which characteristics are physical properties?
They do not change the substance

Physical Properties are
Characteristics of a substance that can be observed

Density is
amount of matter in a given volume

Density Equation and Label
$D = \frac{mass}{Volume}$ $V\sqrt{m}$

DENSITY PRACTICE PROBLEM

The mass of an object is 200 g. The volume of the object is 2 cm3. What is the density?

$2\overline{)200} = 100\ g/cm^3$

The mass of an object is 75 g. The volume of the object is 125 cm3. What is the density?

$125\overline{)75.0} = 0.6\ g/cm^3$

Weight and Mass Gizmo

Go to www.explorelearning.com and login using the username and password in your agenda or science notebook. If you can't find it, use the emergency loin: kearneyb911 password: sit911

Student Exploration: Weight and Mass

Gizmo Warm-up

On the *Weight and Mass* Gizmo™, you can use a **balance** to compare the masses of objects.

1. Place the **dog** on the right pan of the balance. What happens?

   _____

2. Place the **5-kilogram (kg) mass** on the other pan. Which has more mass, the dog or the 5-kg mass?

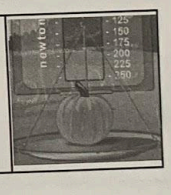
   _____

3. The 5-kg mass is heavier than the dog, so take it off the pan and place a 1-kg mass on the pan. Add 1-kg masses to the left pan until it goes down. Then take one of the 1-kg masses off the pan so that the masses are above the dog.

4. Use this process of adding and subtracting other masses from the left pan until the two pans are balanced. Add up all the masses on the left pan. This is equal to the mass of the dog.

   What is the mass of the dog? _____

   **You can check your answer by clicking the center of the cross beam of the balance.

Activity A: **Weight on different planets**	Get the Gizmo ready: • Click **Clear scales** to remove all objects from the spring scale and the balance. • Click the center of the cross beam of the balance to turn off the mass display.	

Question: Will an object's weight change on different planets?

Introduction: A **spring scale** is used to measure **force**. Since weight is a type of force, a spring scale can measure weight. The metric unit of force is the **newton** (N). Place the **pumpkin** on the spring scale. Click the red line on the scale to see the weight measured to the nearest newton.

5. Record the weight in the chart in the chart. Use the **spring scale** to measure the weights of the following objects on Earth, the Moon, Mars, and Jupiter. Record your measurements in the data table below.

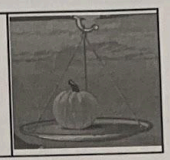
	Pumpkin	Dog	Watermelon
Weight on Earth			
Weight on Moon			
Weight on Mars			
Weight on Jupiter			

26

26

6. Analyze: Does the weight of an object change when it is moved to a different planet?

_____

Activity B: **Mass on different planets**	Get the Gizmo ready: • Click **Clear scales**.	

Question: How do weight and mass change on different planets?

7. Collect data: Use the **balance** to measure the masses of the following objects on Earth, the Moon, Mars, and Jupiter. Record your measurements in the data table below.

	Pumpkin	Dog	Watermelon
Mass on Earth			
Mass on Moon			
Mass on Mars			
Mass on Jupiter			

1. **Analyze**: Does the mass of an object change when it is moved to a different planet?

_____

2. **Draw conclusions**: Based on what you have learned about mass and weight, why do you think the mass did *not* change but the weight did? _____

_____

_____

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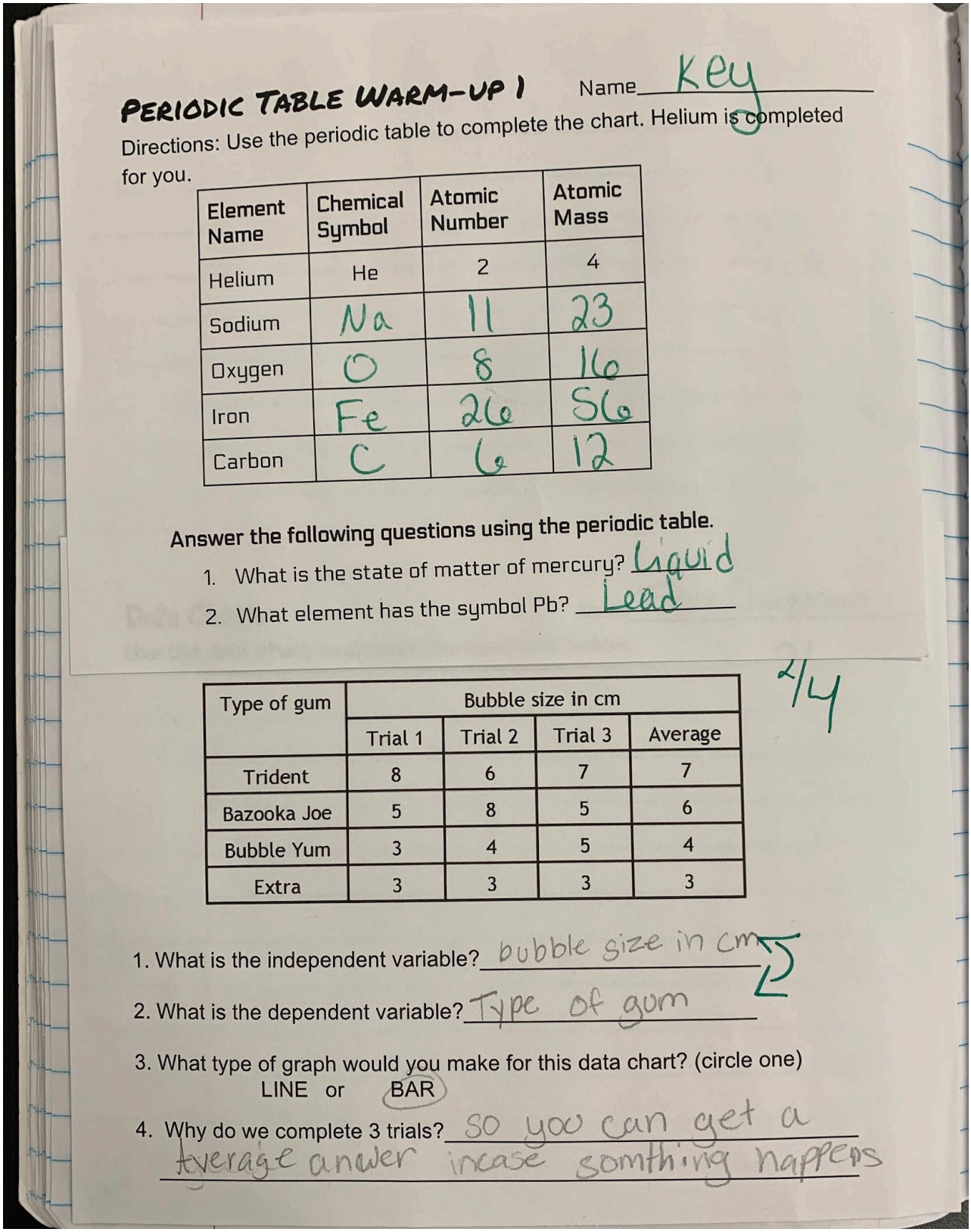
Warm-ups



PERIODIC TABLE WARM-UP 1

Name Key

Directions: Use the periodic table to complete the chart. Helium is completed for you.

Element Name	Chemical Symbol	Atomic Number	Atomic Mass
Helium	He	2	4
Sodium	Na	11	23
Oxygen	O	8	16
Iron	Fe	26	56
Carbon	C	6	12

Answer the following questions using the periodic table.

1. What is the state of matter of mercury? Liquid
2. What element has the symbol Pb? Lead

2/4

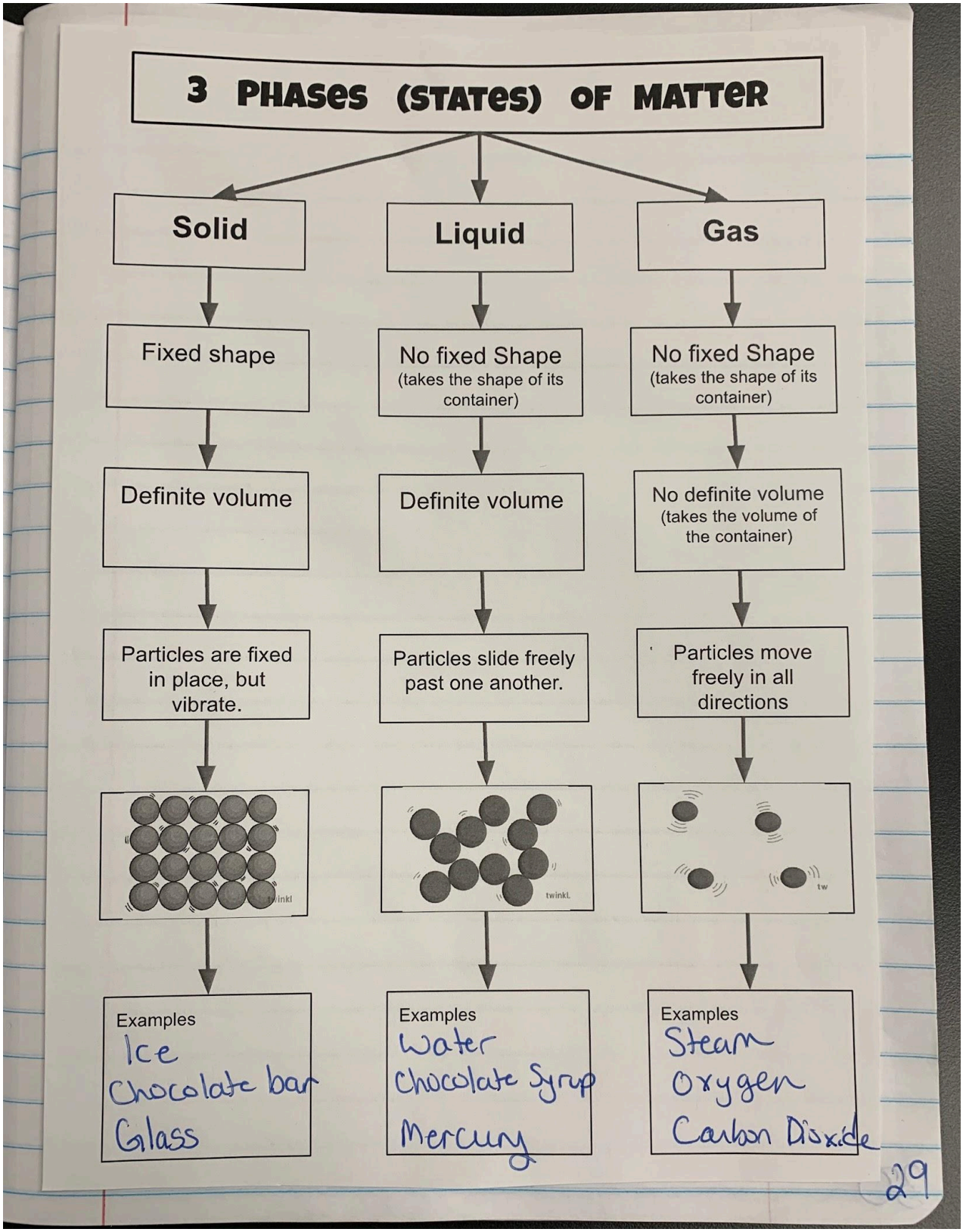
Type of gum	Bubble size in cm			
	Trial 1	Trial 2	Trial 3	Average
Trident	8	6	7	7
Bazooka Joe	5	8	5	6
Bubble Yum	3	4	5	4
Extra	3	3	3	3

1. What is the independent variable? bubble size in cm
2. What is the dependent variable? Type of gum

5/2

3. What type of graph would you make for this data chart? (circle one)
   LINE or (BAR)
4. Why do we complete 3 trials? so you can get a tverage anwer incase somthing happens

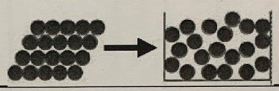
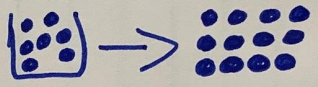
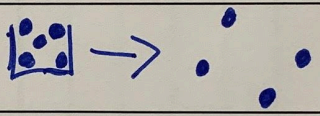
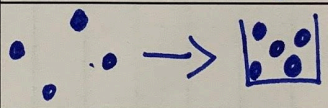
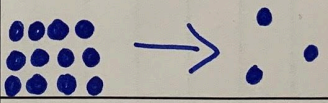
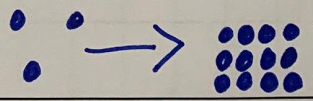
States of Matter Notes



Phase Transition Notes

PHASE TRANSITIONS

Directions: Use pages 50 to 55 in the Matter and Energy textbook to help you complete the chart.

Change in State	Transition	Temperature Increase or Decrease	Endothermic or Exothermic	Draw a picture showing atomic level of this change taking place	Real World Example
Solid to liquid	melting	↑	Endo		popsicle on warm day Candle Wax, Lava
Liquid to solid	freezing	↓	Exo		Making ice cubes Lava cools into rock
Liquid to gas	Vaporization	↑	Endo		Steam puddle in the sun
Gas to liquid	Condensation	↓	Exothermic		Dew on grass mirror fogging glass sweating
Solid to gas	Sublimation	↑	Endo		Dry Ice moth balls air freshner
Gas to solid	Deposition	↓	Exo		Frost, soot snow

30

Thermometer Lab

THERMOMETER LAB

Name _____

Hour _____

Materials
- Thermometer
- Magnifier
- Cold Water
- Hot Water

Procedures:

1. Look closely at your thermometer. The red liquid inside is alcohol that is dyed red.

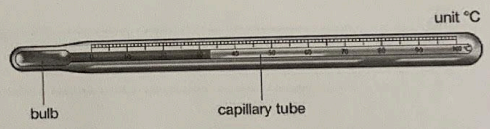
2. Find room temperature by reading the thermometer in _____ °C.

3. Use a magnifying glass to observe the thermometer. Be sure to look at the bulb and the thin inner tube that contains the red alcohol.

4. Gently hold the red bulb in your hand wrapping your hand around the end of the thermometer. Watch the alcohol in the thermometer. How does it change? _____ Why does it change? _____

5. Gently hold the thermometer in the hot liquid and watch the red alcohol. Keep the thermometer in the hot water until the red stops moving. What temperature did it stop at (include units)? _____

6. Repeat step 5 using cold water. Record the temperature. _____



Thinking Questions

1. Based on what you know about the way molecules move in hot liquids, explain why the liquid in the thermometer goes up when heated?

The molecules move faster and spread out causing the red liquid to rise.

2. Based on what you know about the way molecules move in cold liquids, explain why the liquid in the thermometer goes down when cooled?

When cooled the molecules slow down and get close together so the red liquid drops.

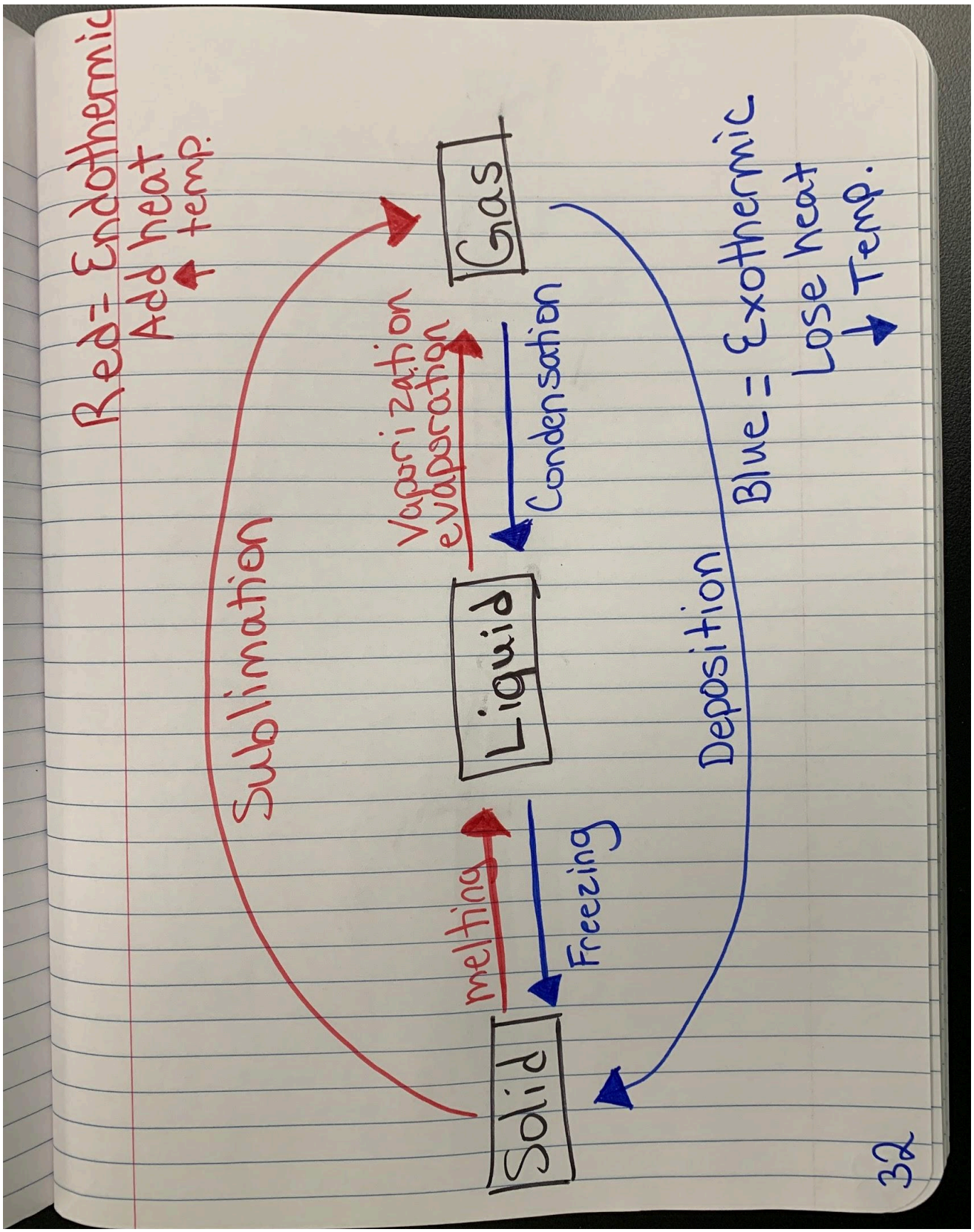
3. Why do you think the tube that contains the red alcohol is so thin?

Keeps the change in volume of the red liquid visible.

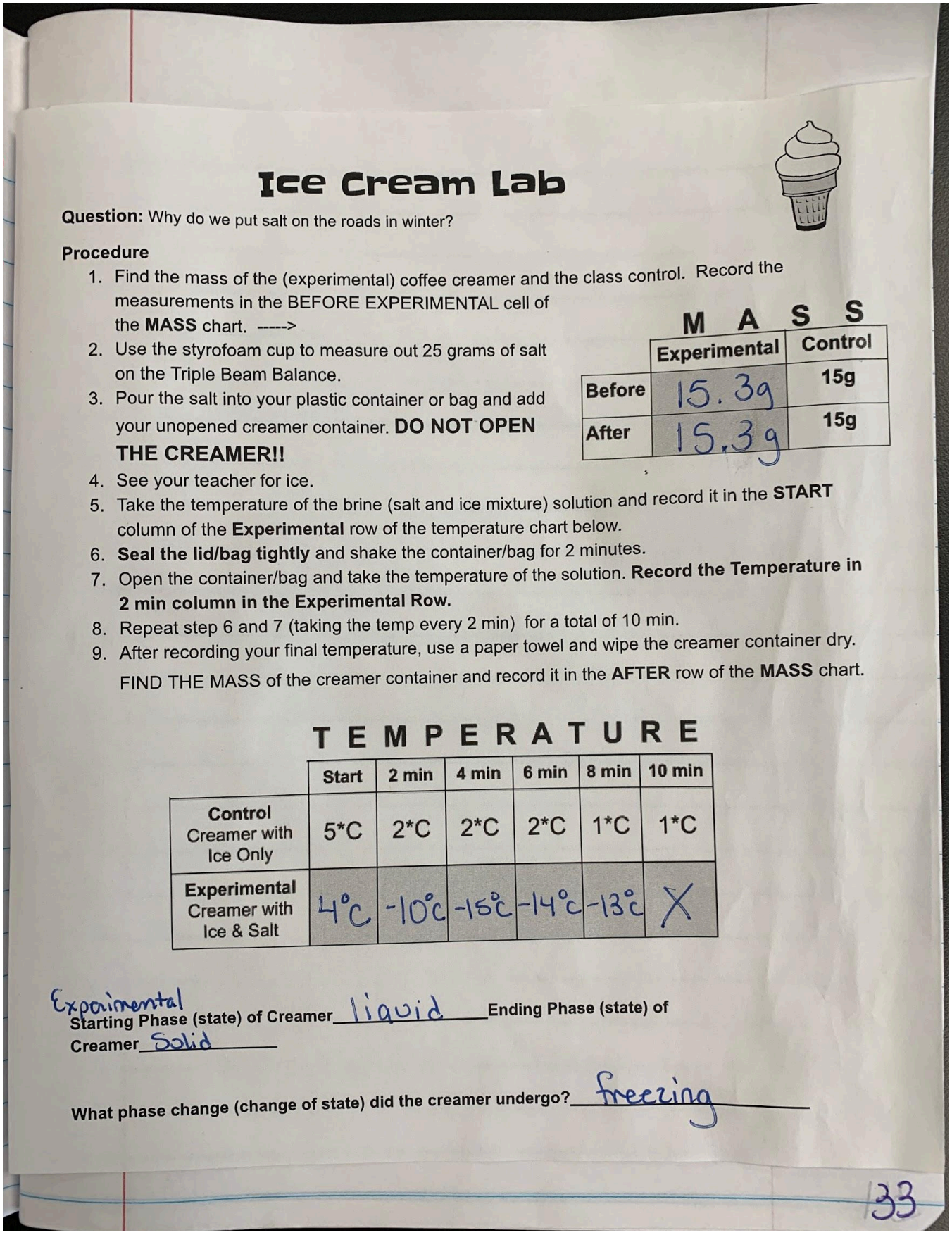
4. What do you think is the purpose for the larger outer tube?

The thicker tube provides the scale + protection

Phase Changes Diagram



Ice Cream Lab



Ice Cream Lab

Question: Why do we put salt on the roads in winter?

Procedure

1. Find the mass of the (experimental) coffee creamer and the class control. Record the measurements in the BEFORE EXPERIMENTAL cell of the **MASS** chart. ----->
2. Use the styrofoam cup to measure out 25 grams of salt on the Triple Beam Balance.
3. Pour the salt into your plastic container or bag and add your unopened creamer container. **DO NOT OPEN THE CREAMER!!**
4. See your teacher for ice.
5. Take the temperature of the brine (salt and ice mixture) solution and record it in the **START** column of the **Experimental** row of the temperature chart below.
6. **Seal the lid/bag tightly** and shake the container/bag for 2 minutes.
7. Open the container/bag and take the temperature of the solution. **Record the Temperature in 2 min column in the Experimental Row.**
8. Repeat step 6 and 7 (taking the temp every 2 min) for a total of 10 min.
9. After recording your final temperature, use a paper towel and wipe the creamer container dry. FIND THE MASS of the creamer container and record it in the **AFTER** row of the **MASS** chart.

MASS

	Experimental	Control
Before	15.3g	15g
After	15.3g	15g

TEMPERATURE

	Start	2 min	4 min	6 min	8 min	10 min
Control Creamer with Ice Only	5*C	2*C	2*C	2*C	1*C	1*C
Experimental Creamer with Ice & Salt	4°C	-10°C	-15°C	-14°C	-13°C	X

Starting Phase (state) of Creamer Experimental liquid **Ending Phase (state) of Creamer** Solid

What phase change (change of state) did the creamer undergo? freezing

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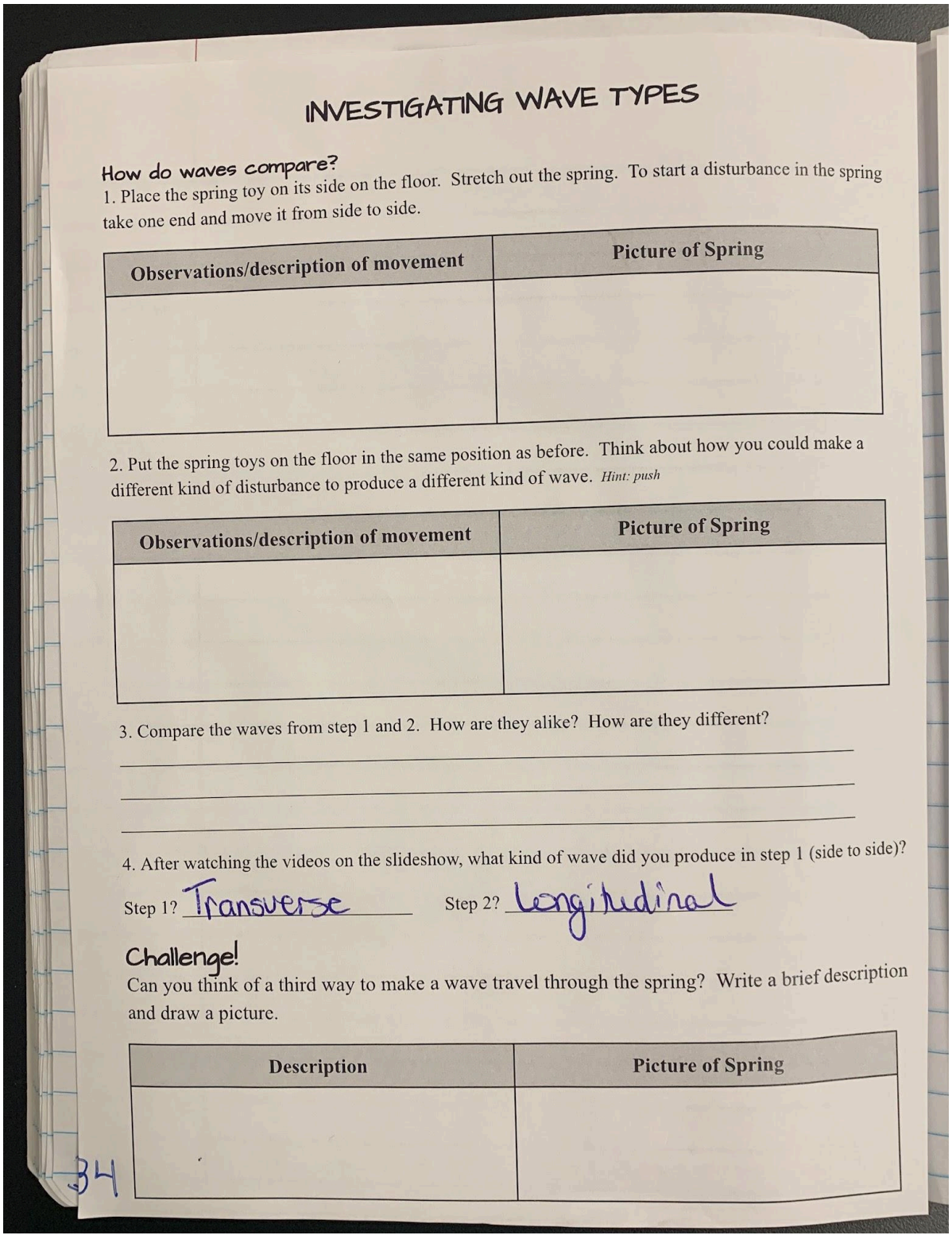
Investigate Waves Lab



INVESTIGATING WAVE TYPES

How do waves compare?

1. Place the spring toy on its side on the floor. Stretch out the spring. To start a disturbance in the spring take one end and move it from side to side.

Observations/description of movement	Picture of Spring

2. Put the spring toys on the floor in the same position as before. Think about how you could make a different kind of disturbance to produce a different kind of wave. *Hint: push*

Observations/description of movement	Picture of Spring

3. Compare the waves from step 1 and 2. How are they alike? How are they different?

4. After watching the videos on the slideshow, what kind of wave did you produce in step 1 (side to side)?

Step 1? Transverse Step 2? Longitudinal

Challenge!

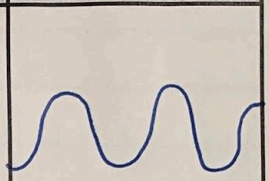
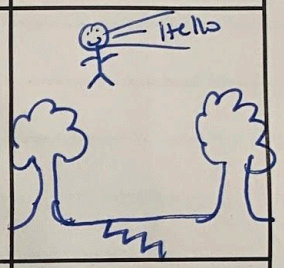
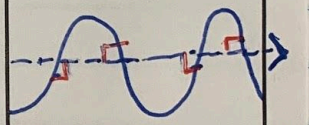
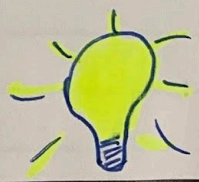
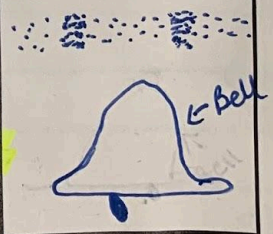
Can you think of a third way to make a wave travel through the spring? Write a brief description and draw a picture.

Description	Picture of Spring

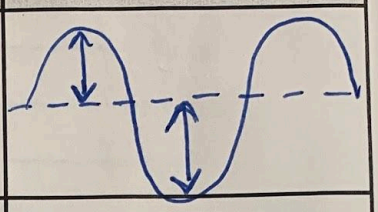
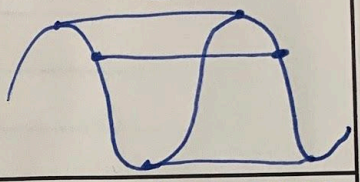
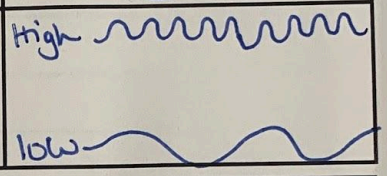
34

Waves Vocabulary

WAVE VOCABULARY

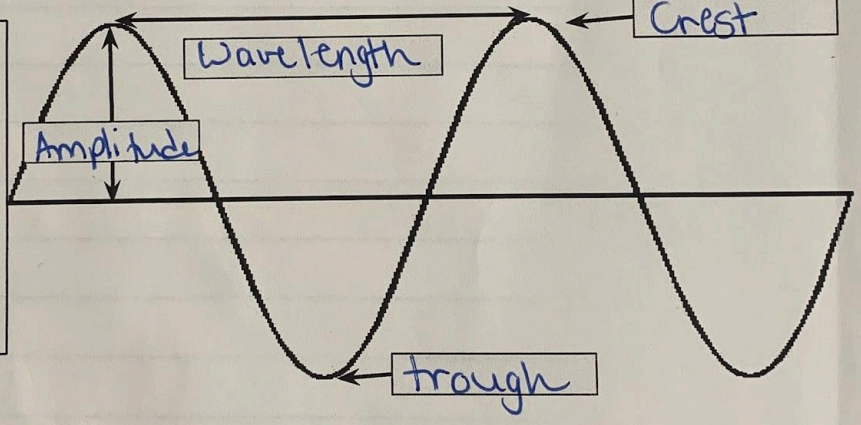
Vocab	Definition	Examples	Picture
Wave	A disturbance that transfers energy	Slinky Ocean Sound Light	
Medium	A substance that a wave travels through	Water Earth Air	
Mechanical Wave	Waves that transfer energy through a medium	Ocean Earth *Sound*	
Transverse Wave Up + Down	Direction wave travels is perpendicular, right angles, to the direction of the disturbance	Water *Light*	 
Longitudinal Wave	Wave travels in the same direction as the disturbance	Slinky *Sound*	

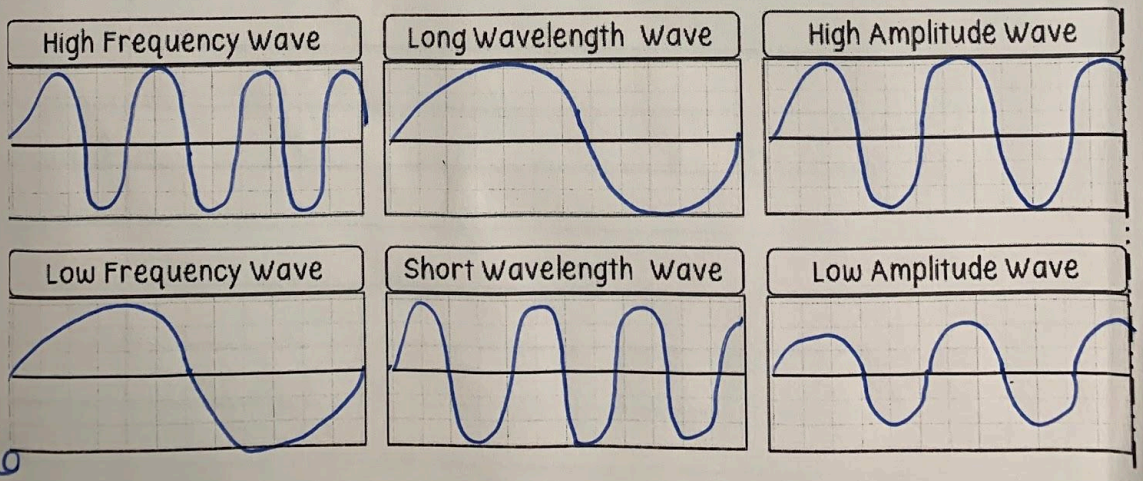
WAVE VOCABULARY

Word	Definition	Picture/Example
Amplitude	measurement from the crest or trough to the resting position	
Wavelength	Distance from Crest to Crest or trough to trough	
Frequency	number of waves that pass in a given time	

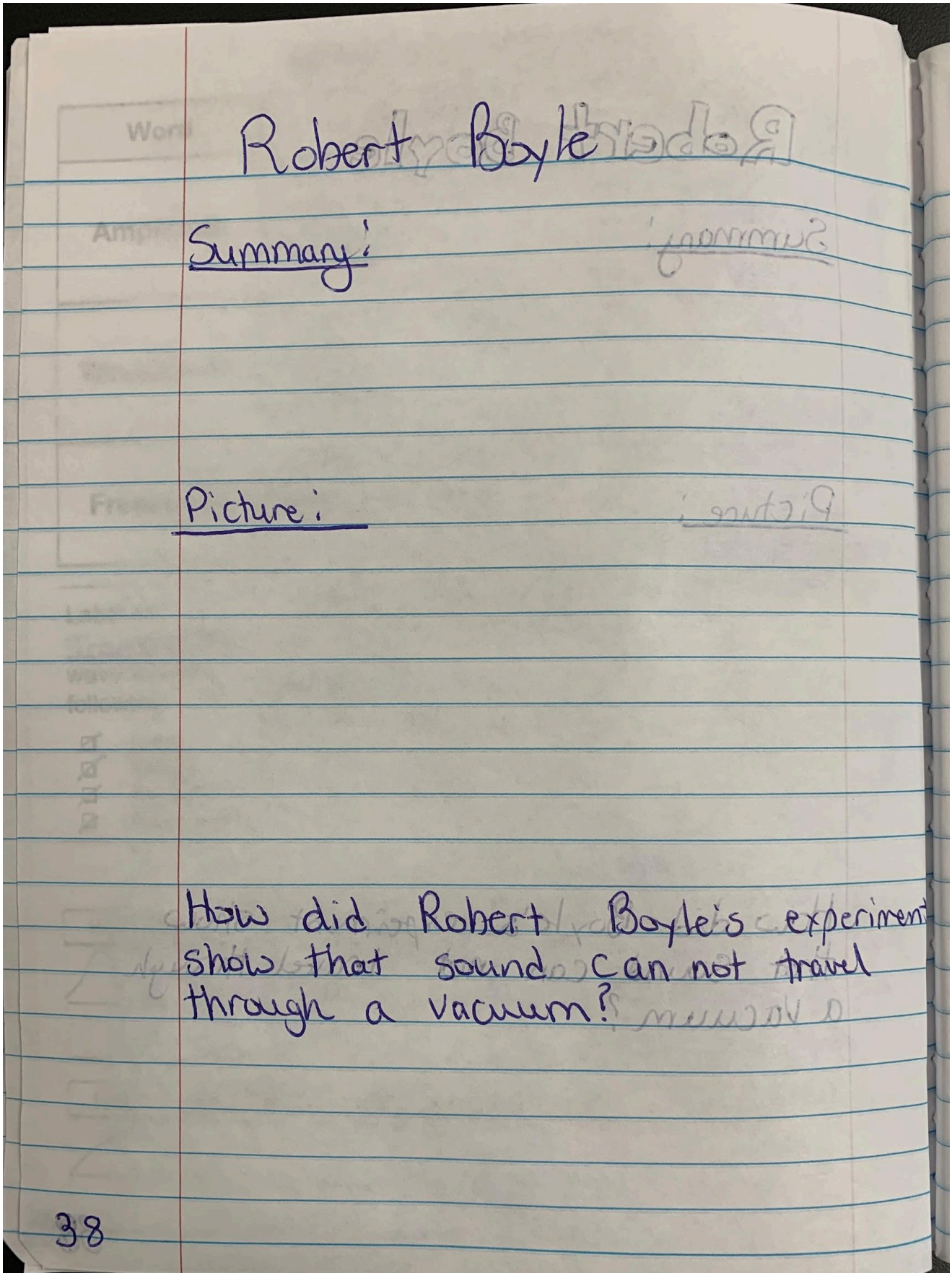
Label the Transverse wave with the following:

- ☑ Crest
- ☑ Trough
- ☑ Amplitude
- ☑ Wavelength

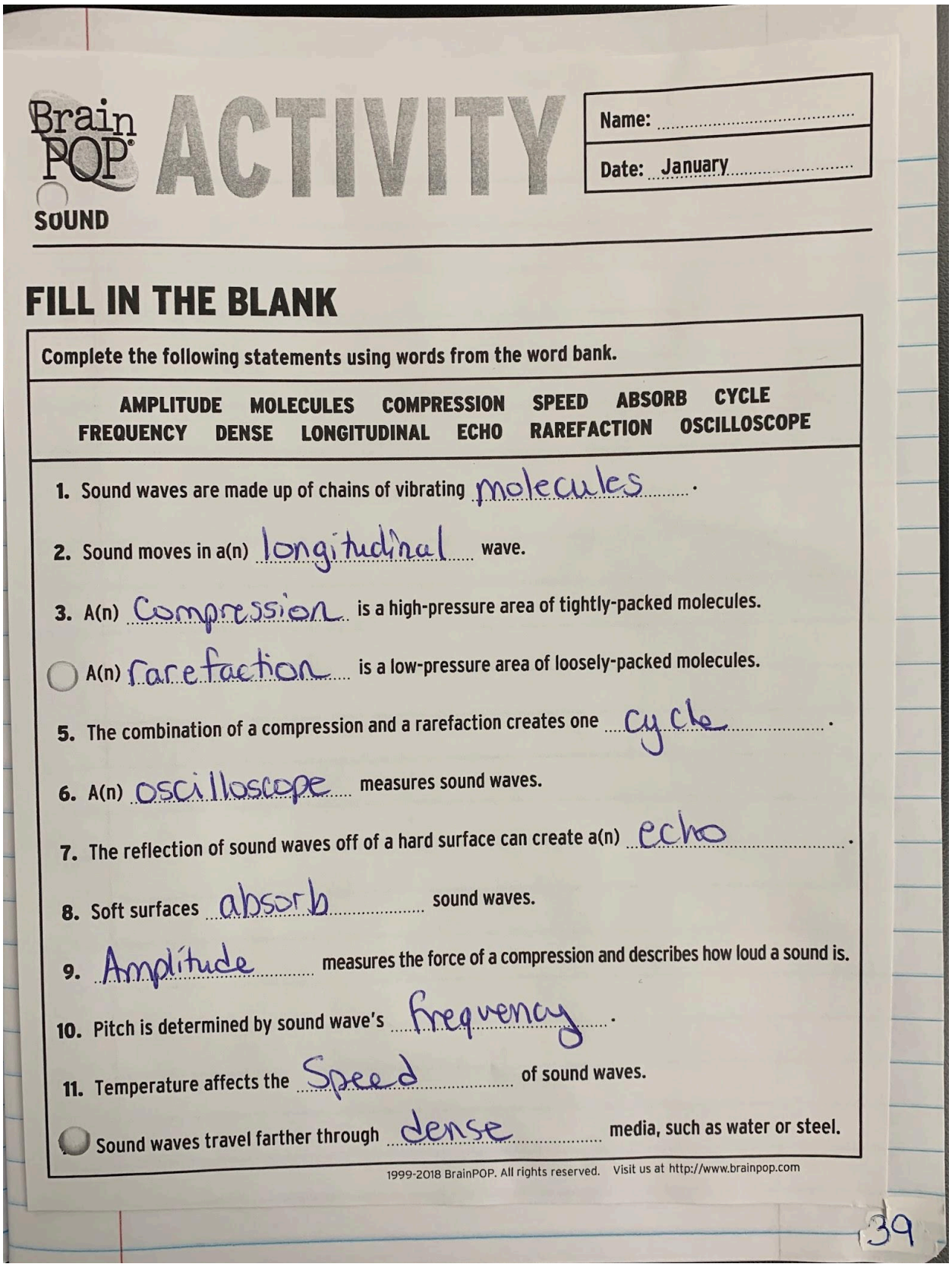




Robert Boyle's Experiment



Sound Brainpop



BrainPOP ACTIVITY

SOUND

Name: .....

Date: January .....

FILL IN THE BLANK

Complete the following statements using words from the word bank.

AMPLITUDE MOLECULES COMPRESSION SPEED ABSORB CYCLE
FREQUENCY DENSE LONGITUDINAL ECHO RAREFACTION OSCILLOSCOPE

1. Sound waves are made up of chains of vibrating molecules.
2. Sound moves in a(n) longitudinal wave.
3. A(n) Compression is a high-pressure area of tightly-packed molecules.
4. A(n) rarefaction is a low-pressure area of loosely-packed molecules.
5. The combination of a compression and a rarefaction creates one cycle.
6. A(n) oscilloscope measures sound waves.
7. The reflection of sound waves off of a hard surface can create a(n) echo.
8. Soft surfaces absorb sound waves.
9. Amplitude measures the force of a compression and describes how loud a sound is.
10. Pitch is determined by sound wave's frequency.
11. Temperature affects the Speed of sound waves.
12. Sound waves travel farther through dense media, such as water or steel.

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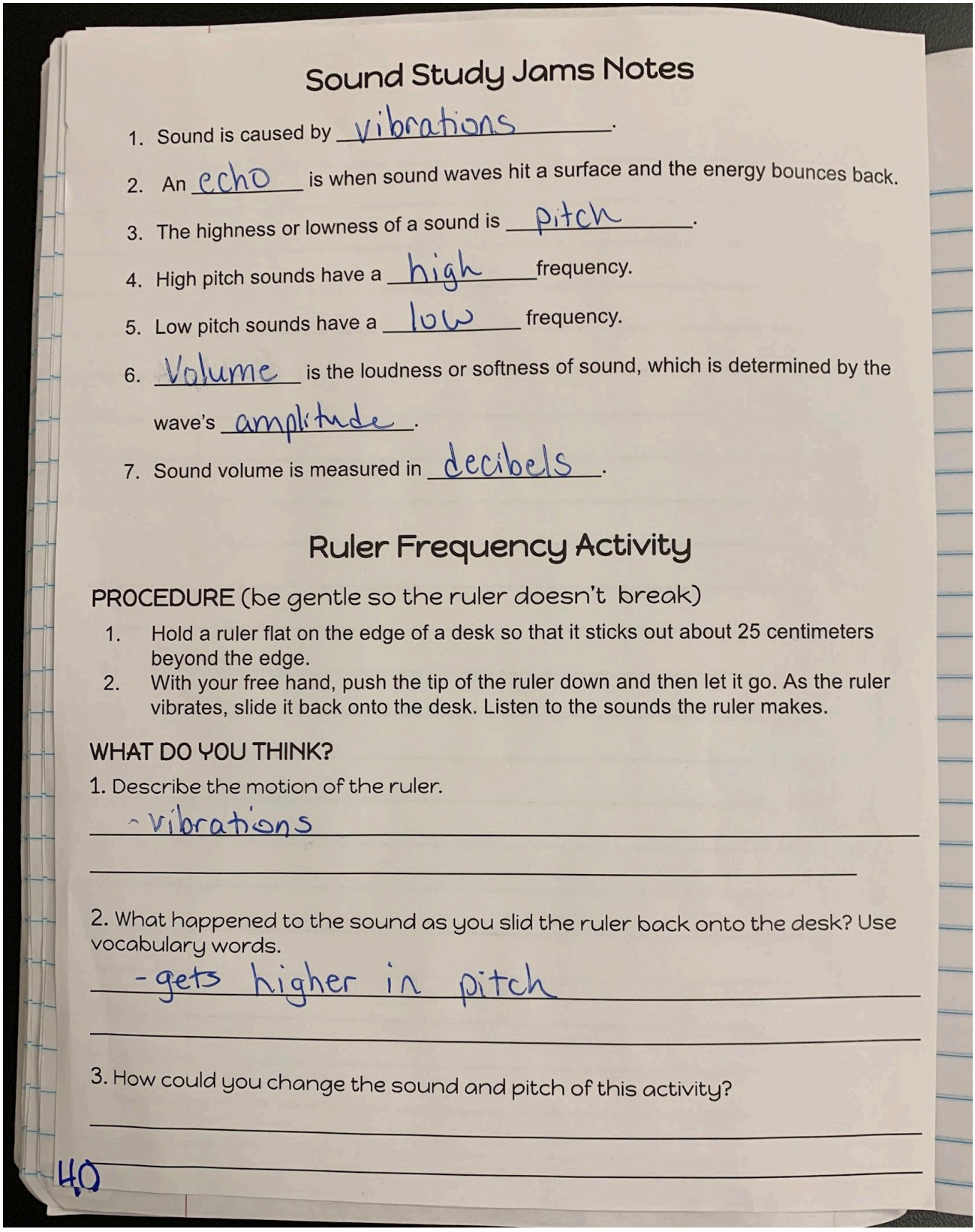
Frequency and Pitch Lab



Sound Study Jams Notes

1. Sound is caused by vibrations.
2. An echo is when sound waves hit a surface and the energy bounces back.
3. The highness or lowness of a sound is pitch.
4. High pitch sounds have a high frequency.
5. Low pitch sounds have a low frequency.
6. Volume is the loudness or softness of sound, which is determined by the wave's amplitude.
7. Sound volume is measured in decibels.

Ruler Frequency Activity

PROCEDURE (be gentle so the ruler doesn't break)

1. Hold a ruler flat on the edge of a desk so that it sticks out about 25 centimeters beyond the edge.
2. With your free hand, push the tip of the ruler down and then let it go. As the ruler vibrates, slide it back onto the desk. Listen to the sounds the ruler makes.

WHAT DO YOU THINK?

1. Describe the motion of the ruler.

- vibrations

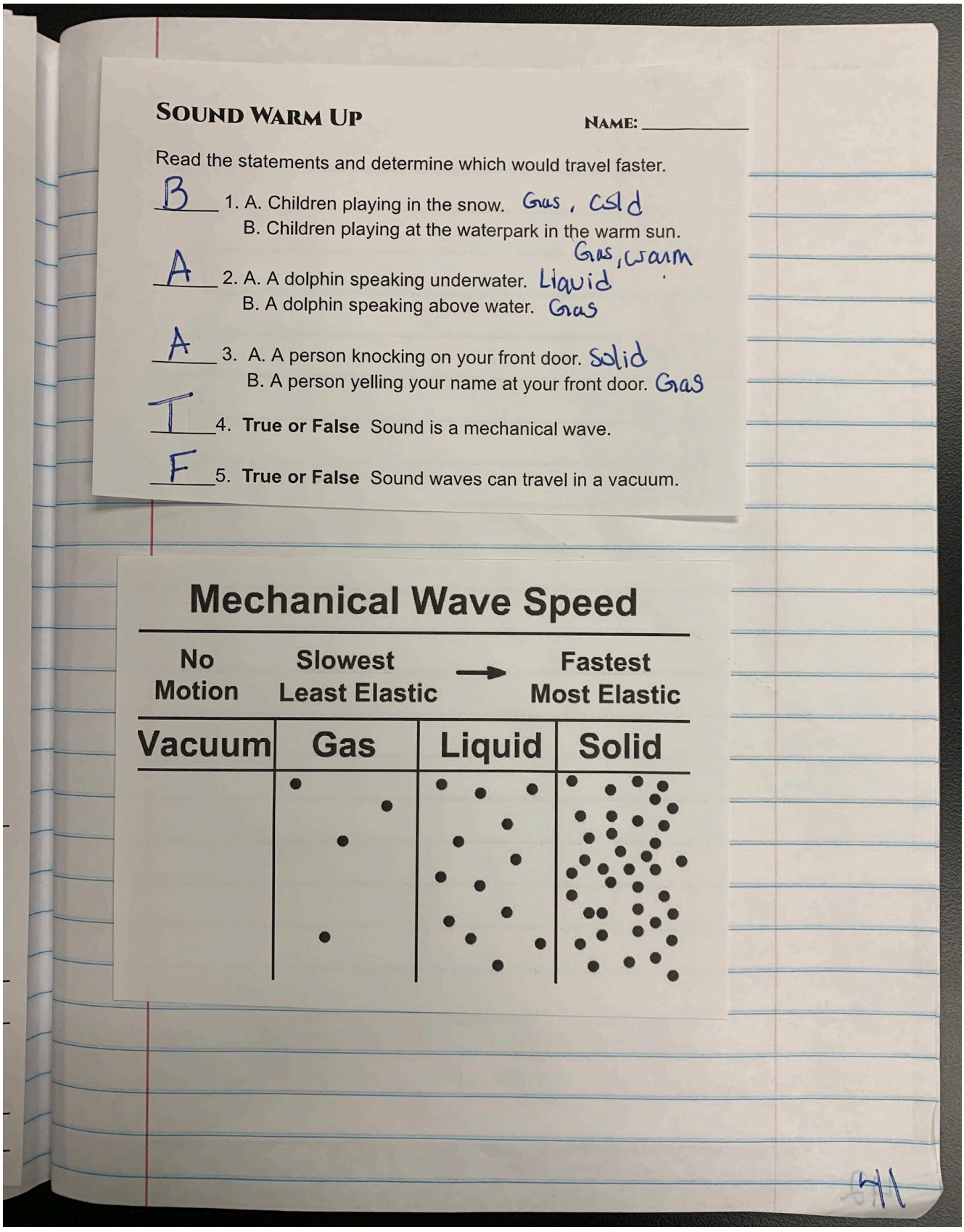
2. What happened to the sound as you slid the ruler back onto the desk? Use vocabulary words.

- gets higher in pitch

3. How could you change the sound and pitch of this activity?

40

Sound Warm-Ups



SOUND WARM UP NAME: _____

Read the statements and determine which would travel faster.

B 1. A. Children playing in the snow. Gas, cold
B. Children playing at the waterpark in the warm sun. Gas, warm

A 2. A. A dolphin speaking underwater. Liquid
B. A dolphin speaking above water. Gas

A 3. A. A person knocking on your front door. Solid
B. A person yelling your name at your front door. Gas

T 4. **True or False** Sound is a mechanical wave.

F 5. **True or False** Sound waves can travel in a vacuum.

Mechanical Wave Speed

No Motion	Slowest Least Elastic →		Fastest Most Elastic
Vacuum	Gas	Liquid	Solid

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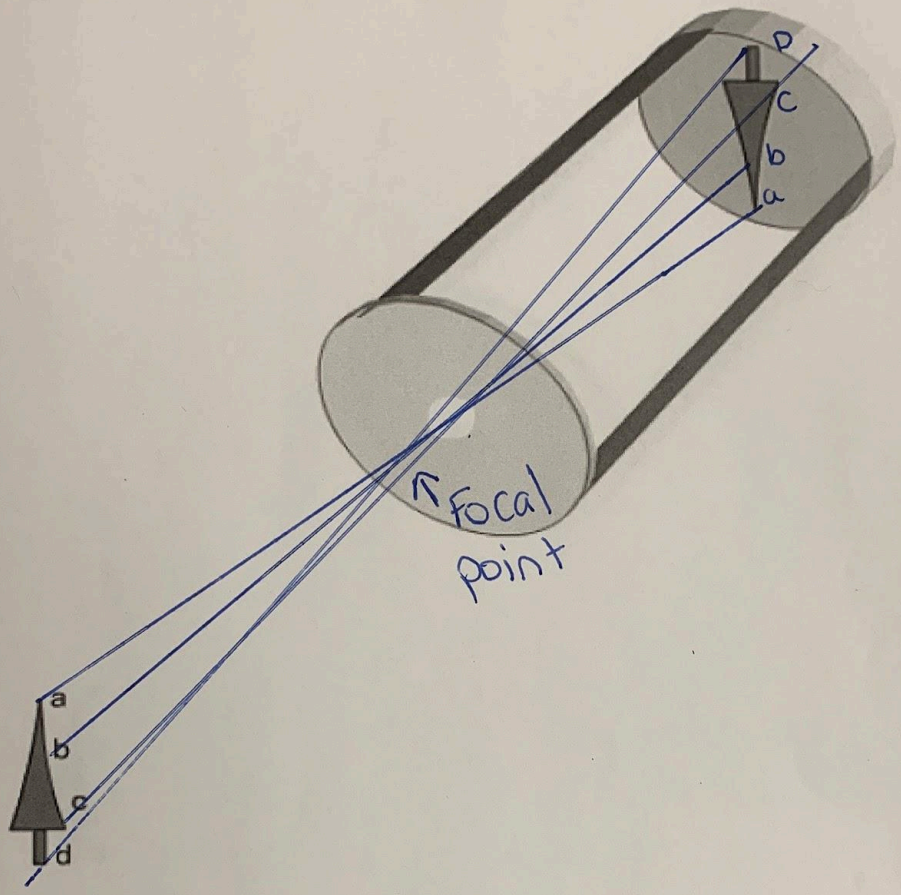
How Light Travels Lab

How does light travel?

Using the diagram below, draw a straight line with a ruler from points a, b, c, and d on the tree through the pinhole on the wax paper to the same point on the upside tree.



Use your drawing to explain the orientation (upright or upside down) of the image on the wax paper you observed in the lab activity.

The image on the wax paper is upside down because the light is squeezed through the hole but it continues in a straight line crossing at the focal point

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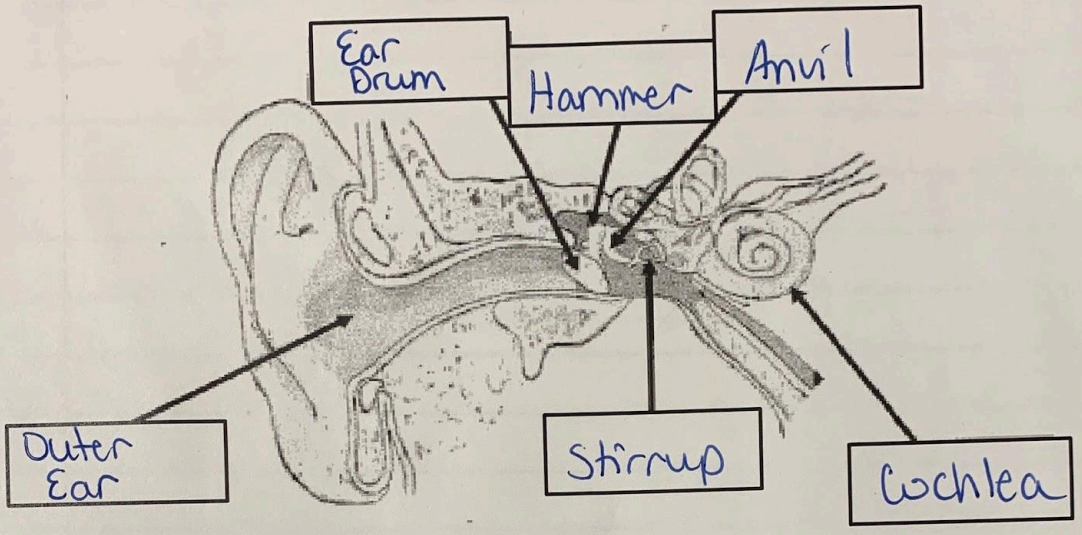
Ear Diagram

EAR DIAGRAM Name_____

Directions: Use page 39 in your textbook to help you label the parts of the ear.



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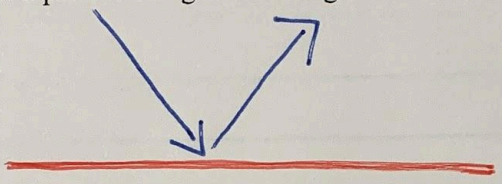
Wave Behavior Notes Reflect, Refract and Diffract

Wave Behavior Notes

Reflection

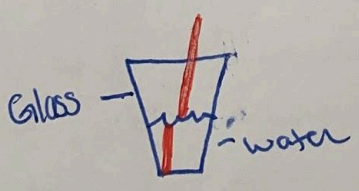
- The bouncing back of a wave after it strikes a barrier
- Sound and light waves can reflect.
  - Sound = echo
  - Light = image
- Draw a picture of light reflecting off of a barrier.

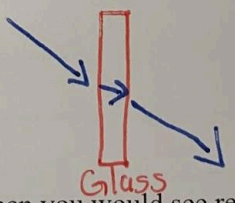


- Think of two real world examples of when you would see a reflection.
  - echo - small gym
  - image - mirror

Refraction

- The bending of a wave as it enters a new material at an angle other than 90 degrees.
- Speed of light stays the same until it encounters a new medium
  - Travels the fastest in a gas
  - Travels the slowest in solid
- Draw a picture of a wave refracting through air to water.

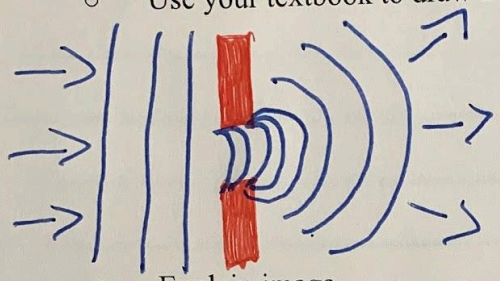




- List 2 real world examples of when you would see refraction.
  - straw in glass
  - Prism

Diffraction

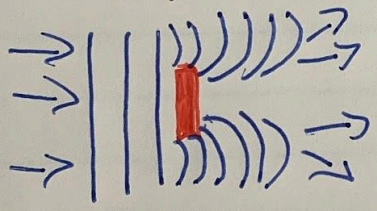
- The Spreading out of waves through an opening or around the edge of an obstacle.
- When light waves travel **through an opening:**
  - Use your textbook to draw a picture below.



  - Explain image

Waves spread out in a circular motion as they pass through the opening.

- When light waves travel **around an obstacle**:
  - Use your textbook to draw a picture below.



  - Explain image

Waves spread out around the edges of the barrier

- List 2 real world examples of diffraction
  - Light = Fuzzy shadow
  - Sound = muffled sound around a corner

PhET Bending Light Lab

Bending Light PhET Lab

Part A: Reflection of Light Waves

DIRECTIONS:

1. For each scenario, select the top and bottom material as specified at the top of the box.

2. Move the protractor and line it up with the surface of the interface between the two materials.

3. Press the red button to turn on the laser.

4. Move the laser to the correct angle. Two angles of incident (laser) have been chosen for you (30% &70%).

5. The incident angle (laser) is drawn for you. Draw the reflected angle (**red pen**), and refracted angle (**blue pen**) on the protractor and record in the data table.

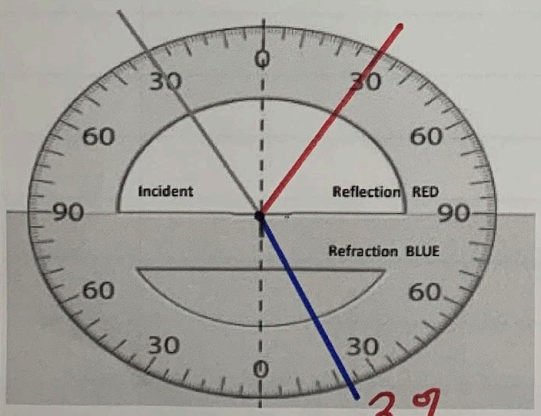
6. Use the Intensity meter to measure the amount (%) of light **reflected** and **refracted.**
   - Reflected light is in the same medium. Refracted light is light traveling in a different medium.

Group Practice

Scenario # 1

Top Material: AIR **Bottom Material:** WATER

Incident Angle	Reflected Angle Red pen	Refracted Angle Blue pen
30°	30°	23°



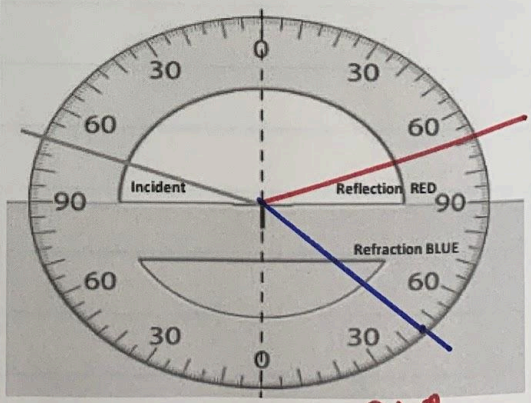
Amount (%) of light Reflected (RED): 3%

Amount (%) of light Refracted (BLUE): 97%

Scenario # 2

Top Material: AIR **Bottom Material:** WATER

Incident Angle	Reflected Angle Red pen	Refracted Angle Blue pen
70°	70°	45°



Amount (%) of light Reflected (RED): 21%

Amount (%) of light Refracted (BLUE): 79%

Color of Light Lab

Color of Light Lab: See procedures at the station.

Observed	No Filter	Red Filter	Blue Filter	Green Filter
White Object				
Black Object				
Red Object				
Yellow Object				

Thinking Questions: Read the "Color Reflection and Absorption" section on page 97 in the Waves, Sound and Light textbook.

Based on your data above, explain how the wavelengths of visible light are affected as they pass through the various filters.

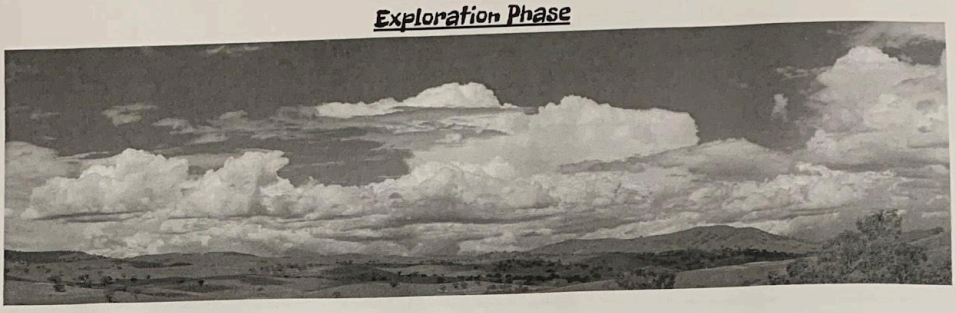
The color of the filter is the only color the object can reflect. All the objects in the red filter appeared redish.

Imagine you are wearing green filter sunglasses while driving. Infer what modifications (changes) you would have to make in order to drive safely through an intersection with a stoplight.

Sources of Light Lab

Sources of light

Exploration Phase



Station One

1. What are the sources of the light around us that we see everyday? Try to list at least Eight!

_____

_____

2.Consider the picture above. Are clouds sources of light? Explain why or why not.

_____

_____

3.Is the moon a source of light? Explain why or why not.

_____

_____

4. What does the word spectrum mean to you?

_____

_____

_____

_____

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Stations 2, 3, 4 & 5

Type of Light	#2 Swirly (fluorescent)	#3 Normal (Incandescent)
Temperature		
Color with naked eye		
Color with spectroscope		
Drawing of spectrum		
Extra Observation		
Type of Light	**#4 LED**	**#5 Moon Reptile Light**
Temperature		
Color with naked eye		
Color with spectroscope		
Drawing of spectrum		
Extra Observation		

5. Where do you think the colors come from? _____

_____

6. Look out the window through the spectroscope. Record your observations.

_____

_____

7. Which light bulb is sunlight more similar to?_____
How do you know?_____

_____

Station 6

Put on a pair of the diffraction grating glasses. Flip the back silver switch of the light tower. Rotate the black knob on top of the tower to view each light. Look at the light with the glasses on.

On the paper mark what colors you see on each part of the spectrum. Use colored pencils to match the letter of visible seen while wearing the glasses.

White	R O Y G B I V
Deep Red	R O Y G B I V
Red	R O Y G B I V
Orange	R O Y G B I V
Yellow	R O Y G B I V
Green	R O Y G B I V
Bright Green	R O Y G B I V
Turquoise	R O Y G B I V
Blue	R O Y G B I V
Deep Blue	R O Y G B I V
Violet	R O Y G B I V

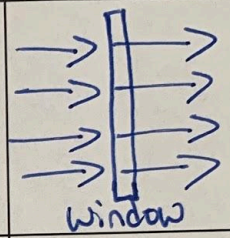
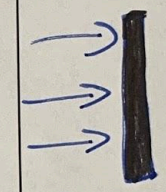
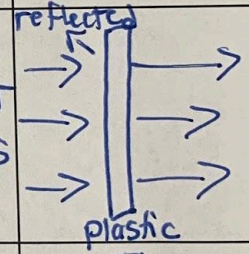
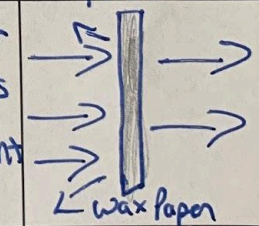
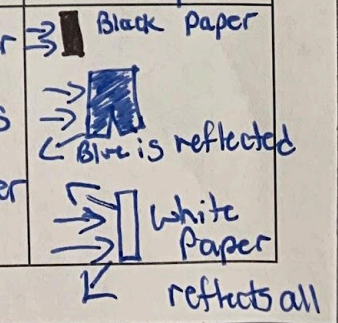
How Light Interacts Notes: Transparent, Translucent and Opaque

HOW LIGHT INTERACTS

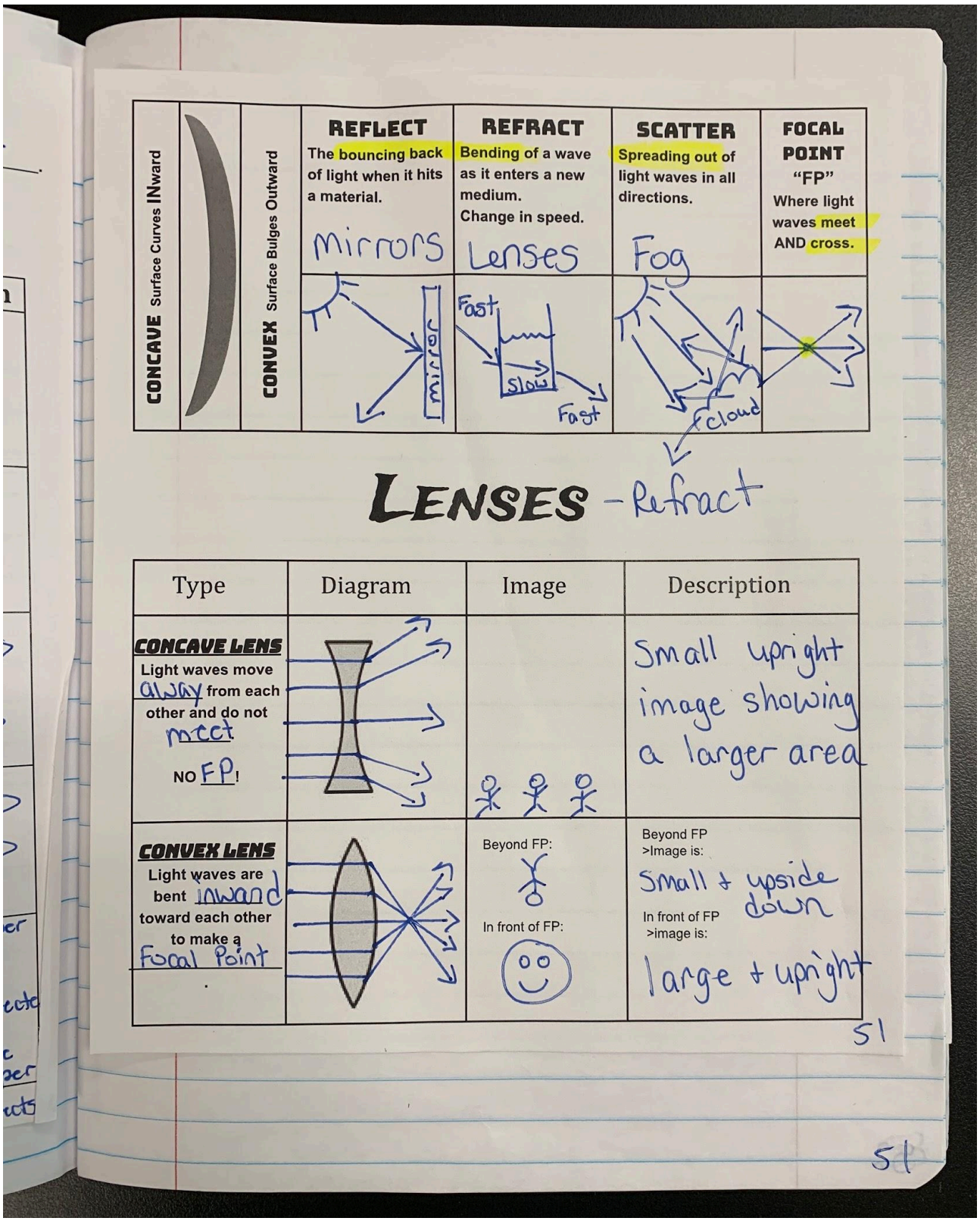
Humans can see an object only when light is produced or reflect.

Light travels in a straight line.

Prism → Tool used to separate the different colors of light.

WORD	Definition	Example	Illustration
Transmit or Transmission	EM waves (LIGHT) passing through a medium.	window glass Clear Plastic	
Absorb or Absorption	Light waves disappear or soak into a medium.	Black objects Science Table	
Transparent Material	Allows most of the light waves to be transmitted or passed through.	windows thermometer Ziploc bags Cell phone screen	
Translucent Material	Allows some of the light waves to be transmitted or passed through.	Wax Paper lamp Shades frosted light bulbs	
Opaque Material	No light transmitted. They are either 1. Absorbed 2. Reflected or 3. Both absorbed and reflected.	Black Paper Blue Jeans White Paper	

Lenses Notes



CONCAVE Surface Curves INward

CONVEX Surface Bulges Outward

REFLECT
The bouncing back of light when it hits a material.
Mirrors

REFRACT
Bending of a wave as it enters a new medium.
Change in speed.
Lenses

SCATTER
Spreading out of light waves in all directions.
Fog

FOCAL POINT
"FP"
Where light waves meet AND cross.

mirror
Fast
slow
Fast
Cloud

LENSES - Refract

Type	Diagram	Image	Description
CONCAVE LENS Light waves move away from each other and do not meet. NO FP!			Small upright image showing a larger area
CONVEX LENS Light waves are bent inward toward each other to make a Focal Point.		Beyond FP: In front of FP:	Beyond FP >Image is: Small & upside down. In front of FP >image is: large & upright

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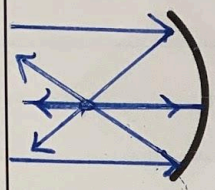
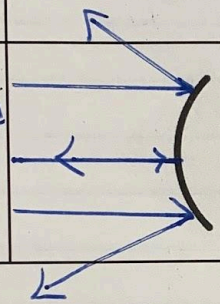
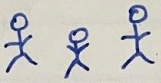
Mirrors Notes

MIRRORS - Reflect

Type	Diagram	Image	Description
CONCAVE MIRROR Light waves reflect inward and cross to create a focal point.		Beyond FP:  In front of FP: 	Beyond FP >Image is: Small + inverted In front of FP >image is: Large + upright
CONVEX MIRROR Light waves reflected outward. No Focal Point!			small but shows a larger area

Compare and Contrast Mirrors and Lenses

1. Both mirrors and lenses create images.
2. Shape determines how mirrors and lenses do this.
3. Mirrors form images by reflecting light.
4. Lenses form images by refracting light.

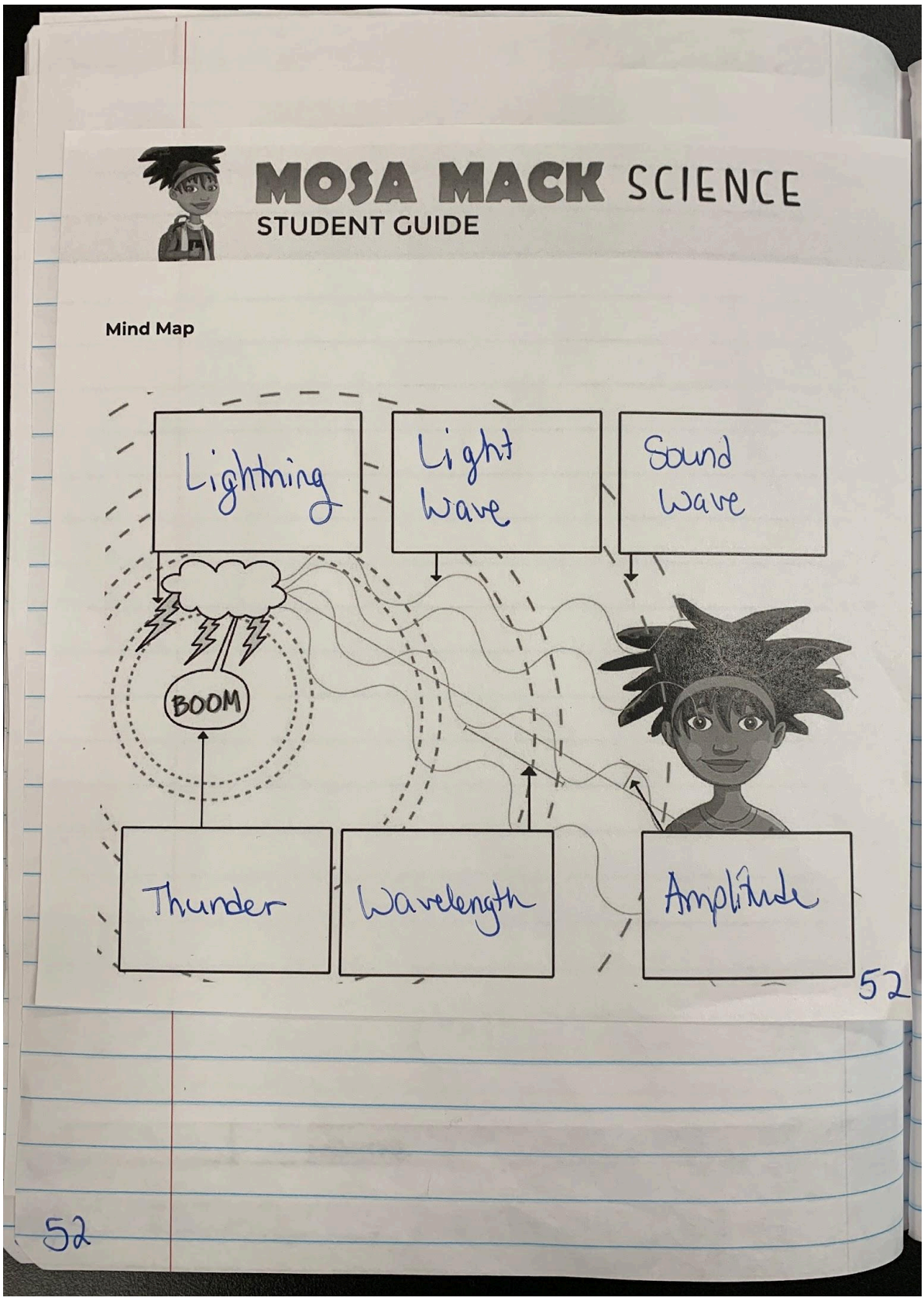
Refracting

Images

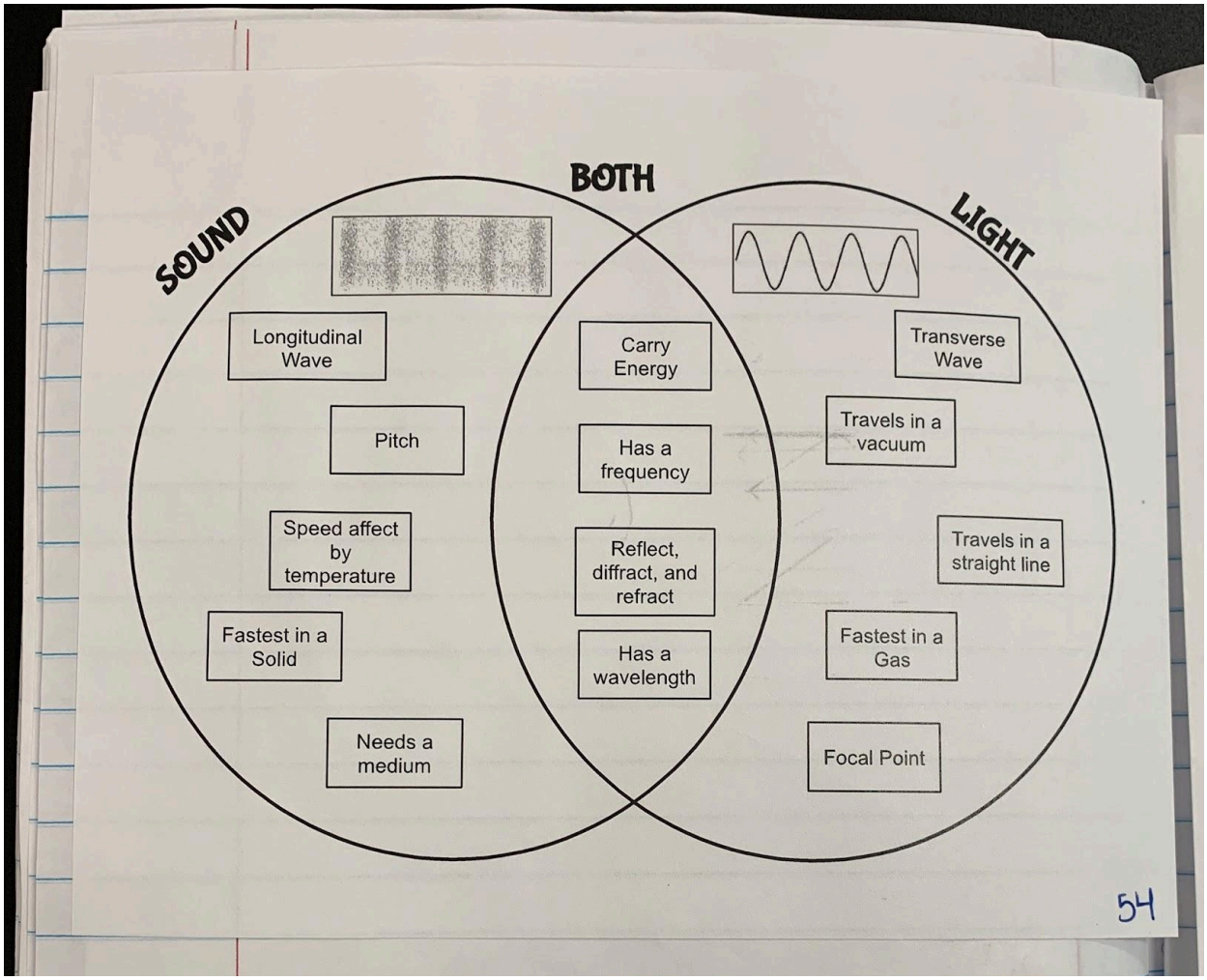
Shape

Reflecting

Mosa Mack Waves



Sound and Light Venn Diagram



Wave Behavior Warm- Ups

Name: Key

Wave Behavior Warm Up

Write the letter on the line under the picture that represents that vocab word.

A. Reflect **B. Refract** **C. Diffract**

1. A

2. C

3. C

4. B

5. A

6. B

Wave Behavior Vocab Matching

Name Key

HR

Use the following words to fill in the blanks. Write the correct letter on the line provided.

A. diffraction **B. interference** **C. refraction** **D. reflection**

B the meeting and combining of waves.

C the bending of a wave as it enters a new medium at an angle other than 90 degrees

A the spreading out of waves through an opening or around the edge of an obstacle

D the bouncing back of a wave after it strikes a barrier

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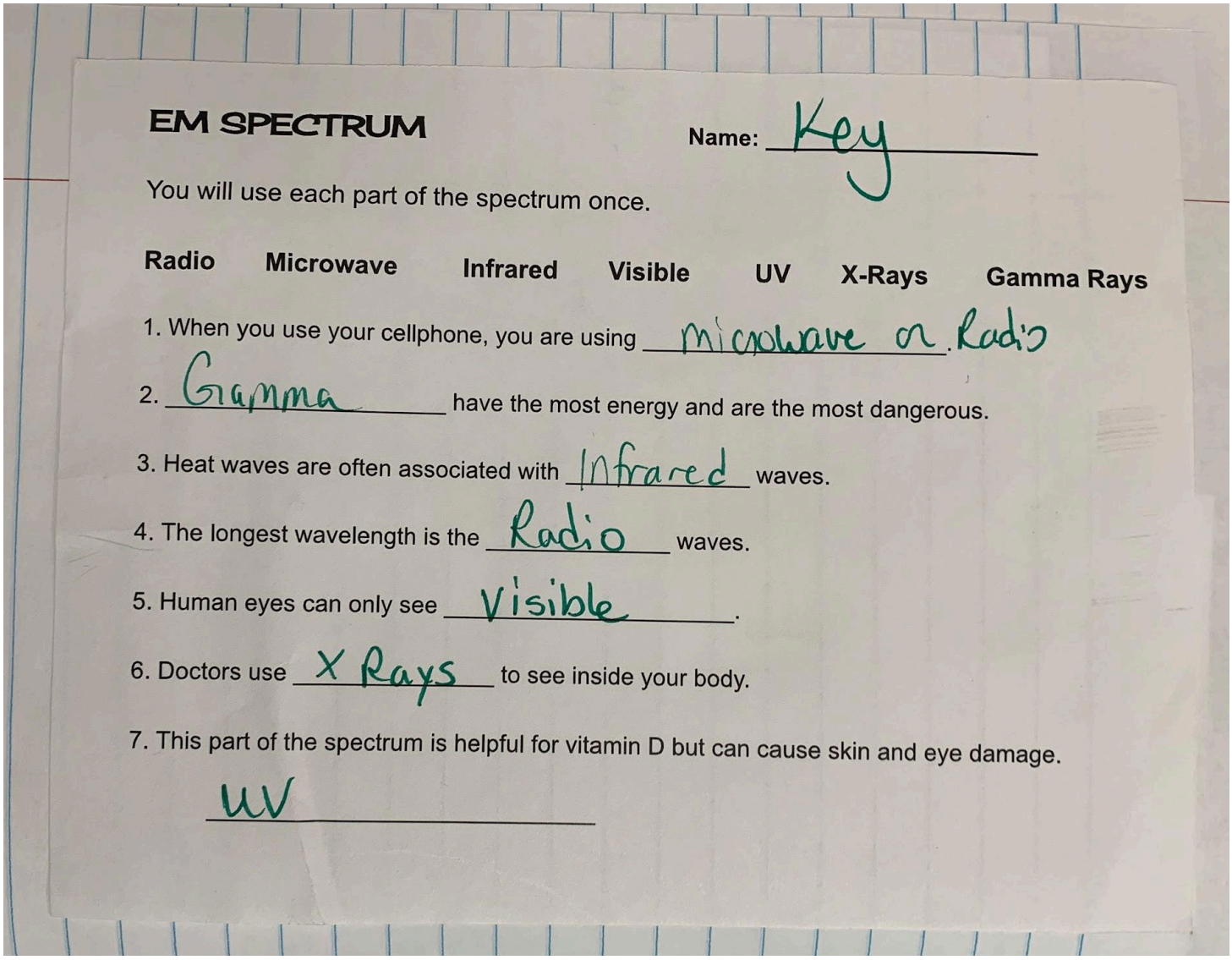
Electromagnetic Spectrum Warm-Up



EM SPECTRUM Name: Key

You will use each part of the spectrum once.

Radio **Microwave** **Infrared** **Visible** **UV** **X-Rays** **Gamma Rays**

1. When you use your cellphone, you are using Microwave or Radio.
2. Gamma have the most energy and are the most dangerous.
3. Heat waves are often associated with Infrared waves.
4. The longest wavelength is the Radio waves.
5. Human eyes can only see Visible.
6. Doctors use X Rays to see inside your body.
7. This part of the spectrum is helpful for vitamin D but can cause skin and eye damage.

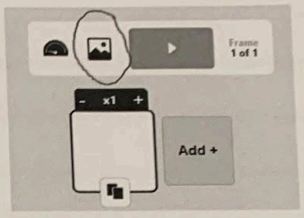
UV

Brush Ninja Reminders

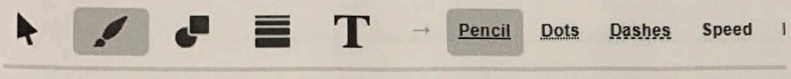
Brush Ninja Reminders

Setting up your background.

- Pick a color or insert an image that works with your concept. You will keep this the same through the whole project.

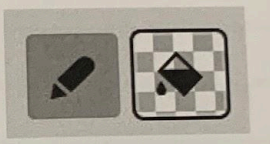


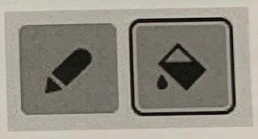
Use the Shapes, Text, and Lines Features



Changing Colors

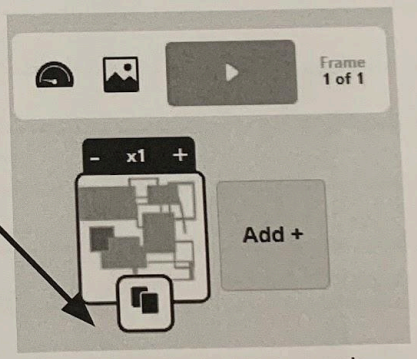
- Pick a color to fill the shape or change the color of the line.
- When the paint bucket has a checkered background, the shape will not be filled in, just outlined.
- When the paint bucket is highlighted the color, it will fill the shape that color.





Adding a Frame

- Make a copy frequently
- Click the square at the bottom of your image to make a copy.
- You will add to the copy each time.



Play Frames Back

- Frequently check how your GIF is looking by hitting the blue play button.

Changing Speed of GIF

- Click on the black speedometer button to see how many frames appear each second.
- May need to adjust according amount of frames.

Settings

- Credits→ #your name

Saving

- Save as Animated Gif
- Use your Name and Vocab word as the name
- Click Download Gif
  - Drag the file from your downloads folder and place it in your drive.

57

Intro to Microscopes

INTRO TO MICROSCOPES

What is this image of? Record your guess.

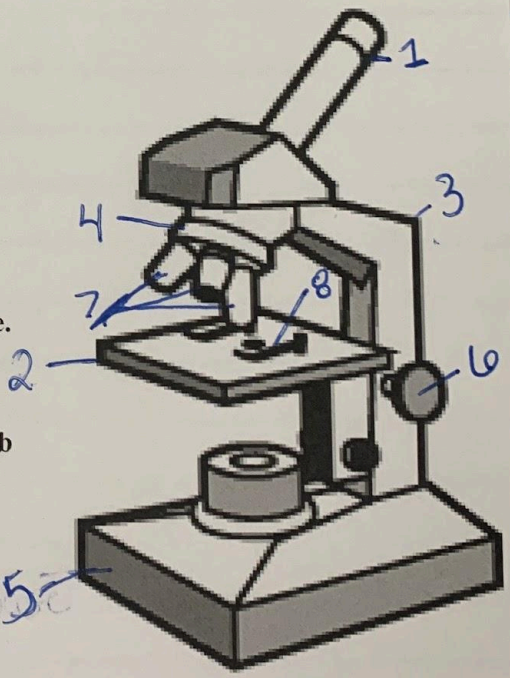
1. Pollen 2. Spider 3. eye 4. grass cell

Fill in the following notes while watching the video.

- Telescopes use Convex and Concave lens.
- Microscopes use two Convex lens.
- The Janssens discovered that two convex lens would magnify something 9 x at a short distance or focal Point.
- Robert Hooke made a discovery in 1665. He observed cork and from the appearance of the cork compartments he coined the term cells.
- Anton Van Leeuwenhoek made a hand held microscope that could magnify up to 270 x.
- He discovered organisms such as bacteria, rotifers in the water, and human cells.
- Other types of microscopes:
  - Ultra microscope
  - phase contrast
  - Electron microscope
  - scanning tunnelling microscope

Write the correct number on the part of the microscope.

1. **Eye piece**
2. **Stage**
3. **Arm**
4. **Nosepiece**
5. **Base**
6. **Coarse Adjustment Knob**
7. **Objectives**
8. **Stage Clip**



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Microscope Usage

MICROSCOPE USAGE * Turn on the light

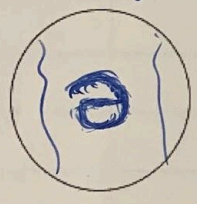
Always hold a microscope by the Arm and Base.

1. Have the arm of the microscope facing you.
2. Raise the tube all the up using the coarse adjustment knob.
3. Put slide on the stage and secure with stage clips.
4. Start with the low (4x) objective.
5. Use the coarse adjustment knob to slowly lower the lens and focus the specimen.
6. Rotate the nosepiece to change to the 10x objective.
7. Use the fine adjustment knob to slowly lower the lens and focus the specimen.
8. Switch to the 40x objective.
9. Use fine adjustment knob to slowly focus on the specimen.

LETTER E MICROSCOPE LAB

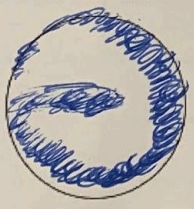
→ To find the total magnification:

eyepiece (10) **magnification x** objective **magnification = total magnification**



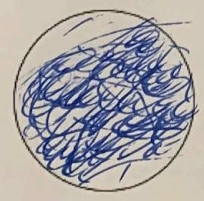
Eyepiece magnification:	10
Objective magnification:	4
Total Magnification:	40x

Description: e is upside down ink is blotchy paper shows fibers



Eyepiece magnification:	10
Objective magnification:	10
Total Magnification:	100x

Description: The ink has quite a bit of white space in the 'e' Some dots of ink are over outside the letter



Eyepiece magnification:	10
Objective magnification:	40
Total Magnification:	400x

Description: I can only see a very small section of the e. The ink is very broken & splotchy

Parts of a Microscope

Name:_____

Parts of a Microscope

Unscramble the letters to spell different parts of the microscope. Color that part the given color.

SNOE CEEPI (blue)
Nose Piece

YEE ECIPE (green)
Eye Piece

IFNE TMUJDENATS NBOK (black)
Fine Adjustment knob

RASECO TMUJDENATS NBOK (red)
Coarse Adjustment knob

RMA (yellow)
Arm

EBSA (pink)
Base

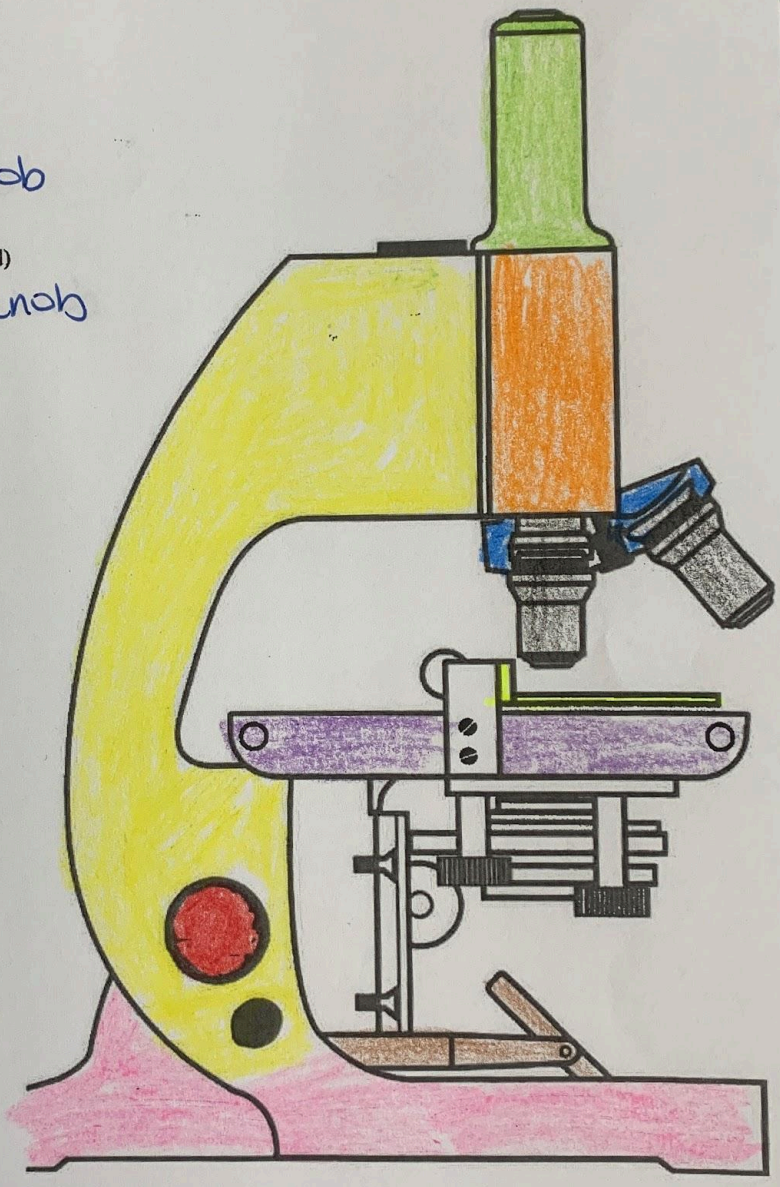
DYOB (orange)
Body

JVESBOCETI (grey)
Objectives

GESTA (purple)
Stage

GESTA IPCLS (highlighter yellow)
Stage Clips

GHILT ORUCSE (brown)
Light Source



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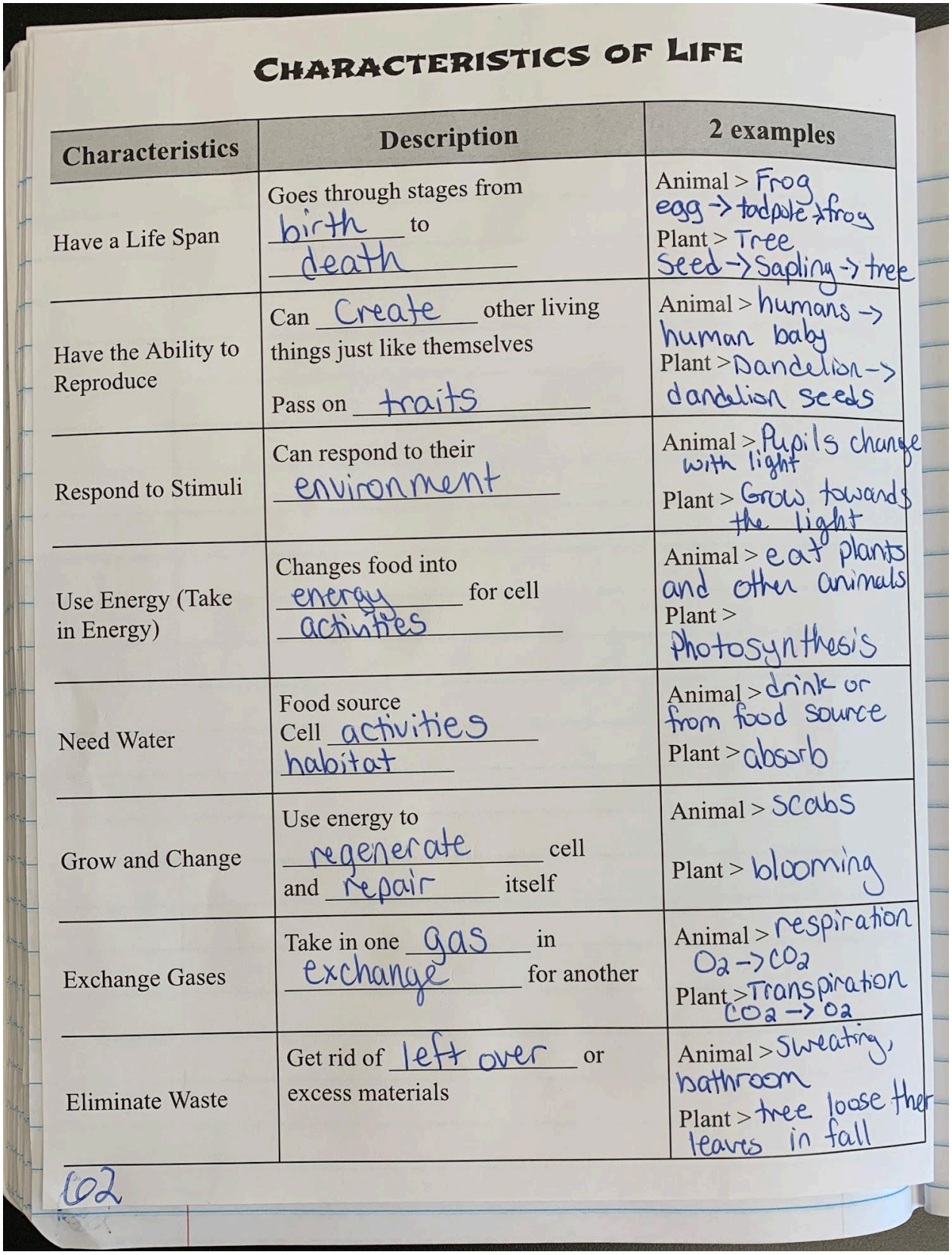
Characteristics of Life Notes

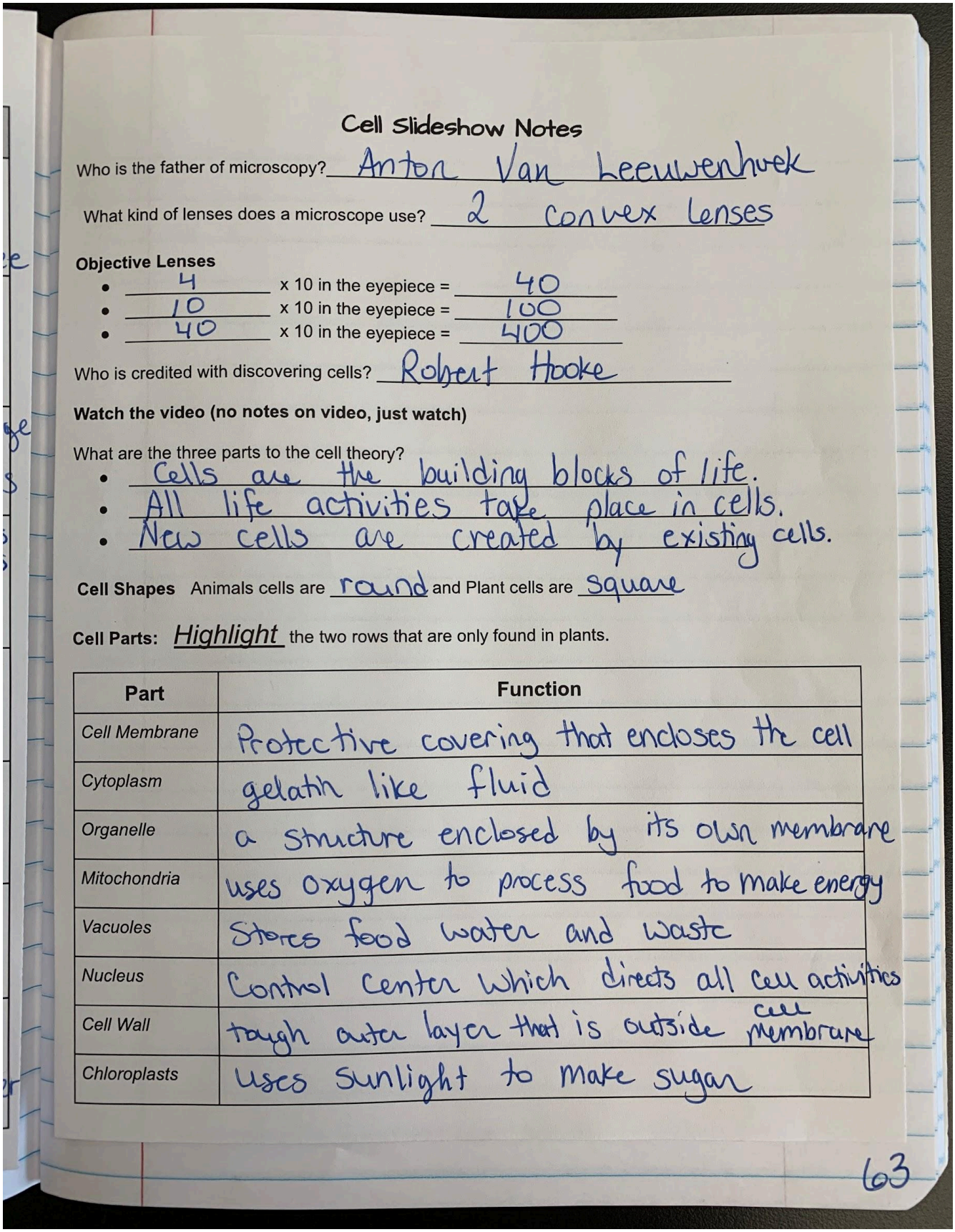


Characteristics of Life

Characteristics	Description	2 examples
Have a Life Span	Goes through stages from birth to death	Animal > Frog egg -> tadpole -> frog Plant > Tree seed -> sapling -> tree
Have the Ability to Reproduce	Can Create other living things just like themselves Pass on traits	Animal > humans -> human baby Plant > Dandelion -> dandelion seeds
Respond to Stimuli	Can respond to their environment	Animal > Pupils change with light Plant > Grow towards the light
Use Energy (Take in Energy)	Changes food into energy for cell activities	Animal > eat plants and other animals Plant > Photosynthesis
Need Water	Food source Cell activities habitat	Animal > drink or from food source Plant > absorb
Grow and Change	Use energy to regenerate cell and repair itself	Animal > scabs Plant > blooming
Exchange Gases	Take in one gas in exchange for another	Animal > respiration $O_2 \rightarrow CO_2$ Plant > Transpiration $CO_2 \rightarrow O_2$
Eliminate Waste	Get rid of left over or excess materials	Animal > Sweating, bathroom Plant > tree loose their leaves in fall

CO_2

Cells Notes



Cell Slideshow Notes

Who is the father of microscopy? Anton Van Leeuwenhoek

What kind of lenses does a microscope use? 2 convex lenses

Objective Lenses

- 4 x 10 in the eyepiece = 40
- 10 x 10 in the eyepiece = 100
- 40 x 10 in the eyepiece = 400

Who is credited with discovering cells? Robert Hooke

Watch the video (no notes on video, just watch)

What are the three parts to the cell theory?

- Cells are the building blocks of life.
- All life activities take place in cells.
- New cells are created by existing cells.

Cell Shapes Animals cells are round and Plant cells are square

Cell Parts: *Highlight* the two rows that are only found in plants.

Part	Function
Cell Membrane	Protective covering that encloses the cell
Cytoplasm	gelatin like fluid
Organelle	a structure enclosed by its own membrane
Mitochondria	uses oxygen to process food to make energy
Vacuoles	Stores food water and waste
Nucleus	Control center which directs all cell activities
Cell Wall	tough outer layer that is outside cell membrane
Chloroplasts	Uses sunlight to make sugar

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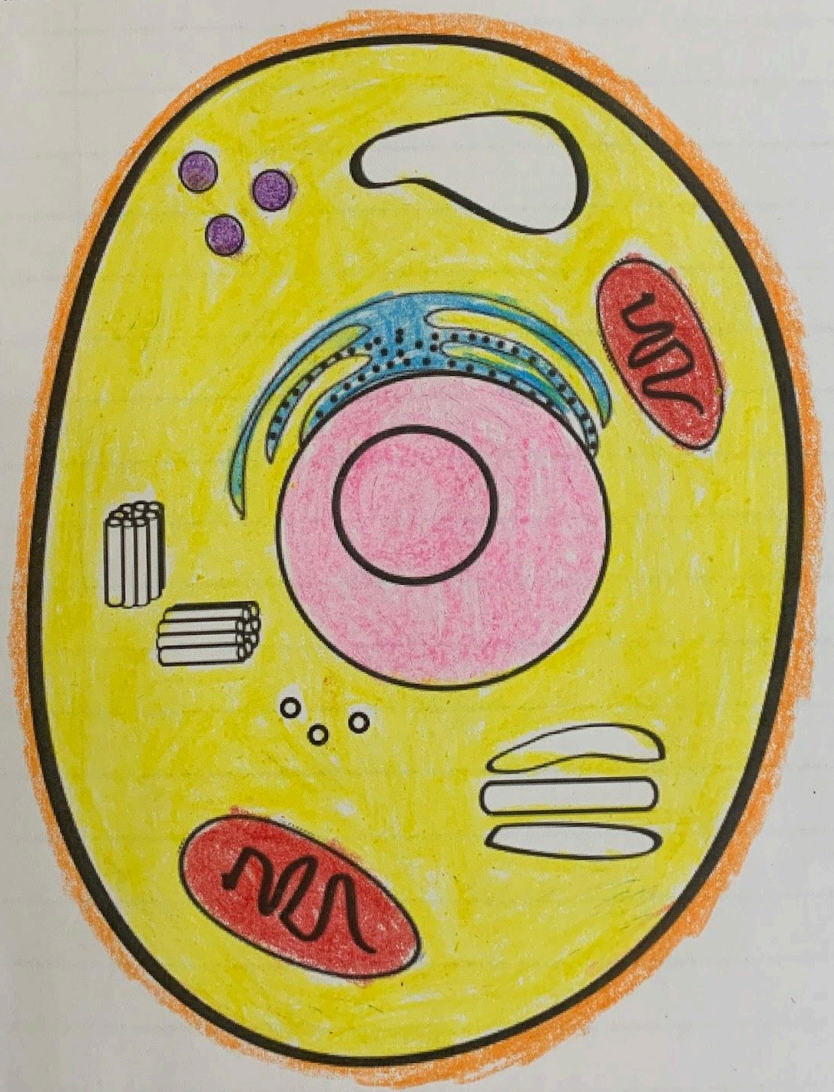
Animal Cell

ANIMAL CELL

Match the cell part to its correct function and then color the part.

1. Mitochondria
2. Nucleus
3. Vacuole
4. Cytoplasm
5. Endoplasmic Reticulum
6. Cell Membrane

- Gelatin like fluid inside the cell -light yellow
- Uses oxygen to process food and creates energy -red
- Control center which directs all cell activities -pink
- Part of the cell's transport system -blue
- Stores food, water and waste -purple
- Protective covering that surrounds the cell -orange



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Plant Cell

PLANT CELL

Match **the cell part to its** ***correct*** **function and then color the part.**

1. Mitochondria
2. Nucleus
3. Vacuole
4. Cell Wall
5. Chloroplast
6. Cytoplasm
7. Endoplasmic Reticulum
8. Cell Membrane

Gelatin like fluid inside the cell -light yellow
Stores water and gives the cell structure -purple
Control center which directs all cell activities -pink
Uses oxygen to process food and creates energy -red
Uses sunlight to make sugar -green
Protective covering that surrounds the cell -orange
Tough outer covering that gives the cell structure -gray
Part of the cell's transport system -blue

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Levels of Organization

Multicellular Organism Specialization

Cell - smallest unit of a living thing

- Examples: red blood cell, neuron, muscle cell

Tissue - group of similar **cells** organized to do a specific job

- There are **4** kinds of tissues in the human body

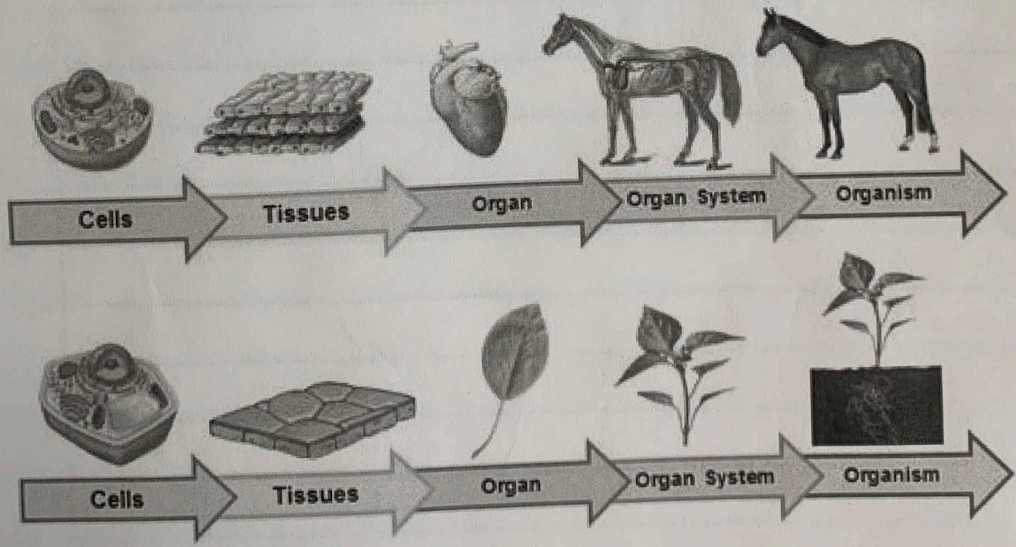
Organ - different tissues working together to perform a function

- Examples: **lungs, heart, brain**

System -different organs and **tissues** working together

- Examples: **circulatory, digestive, respiratory**

Organism -Systems working together at the **highest** level of organization



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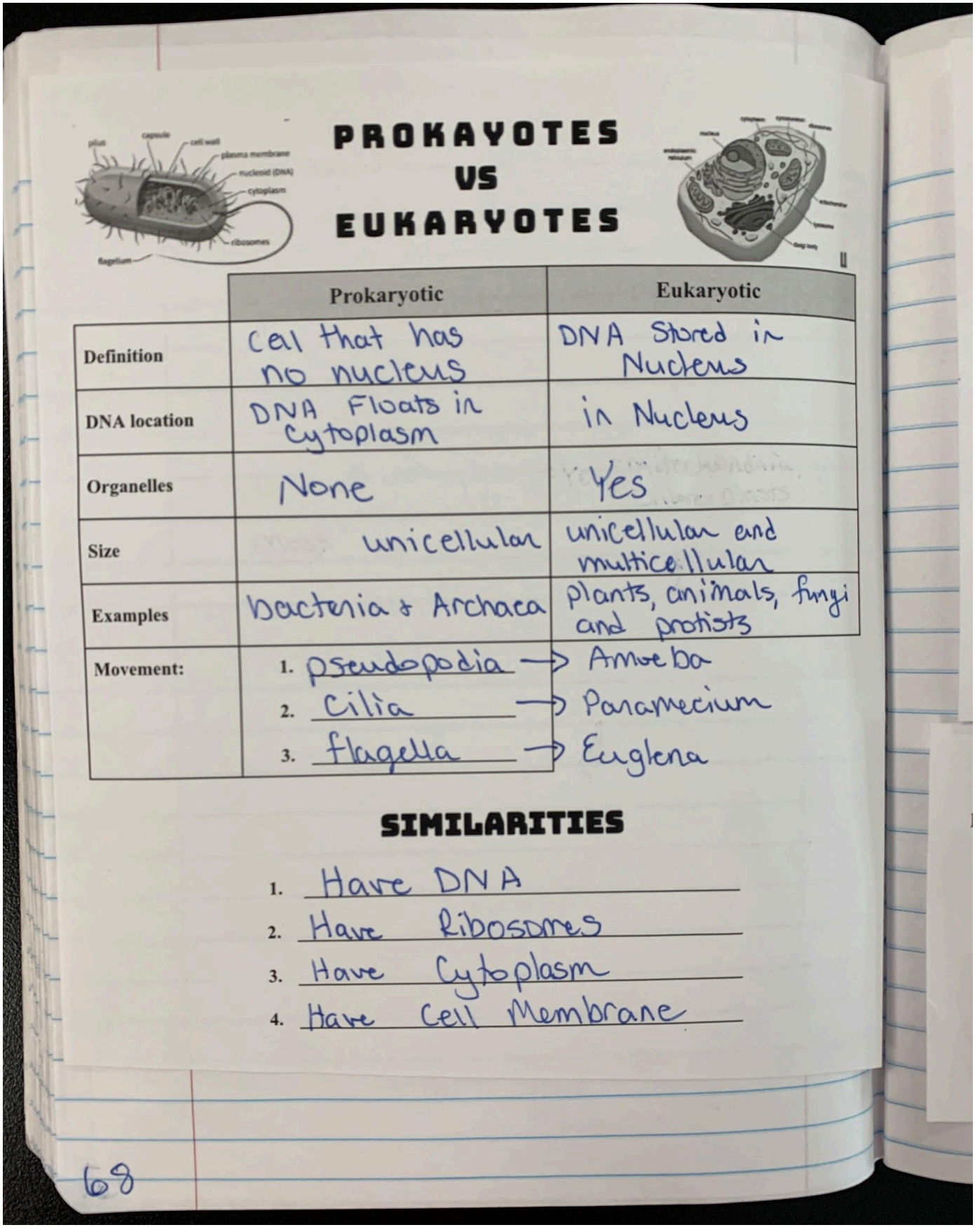
Prokaryotes Vs Eukaryotes Notes



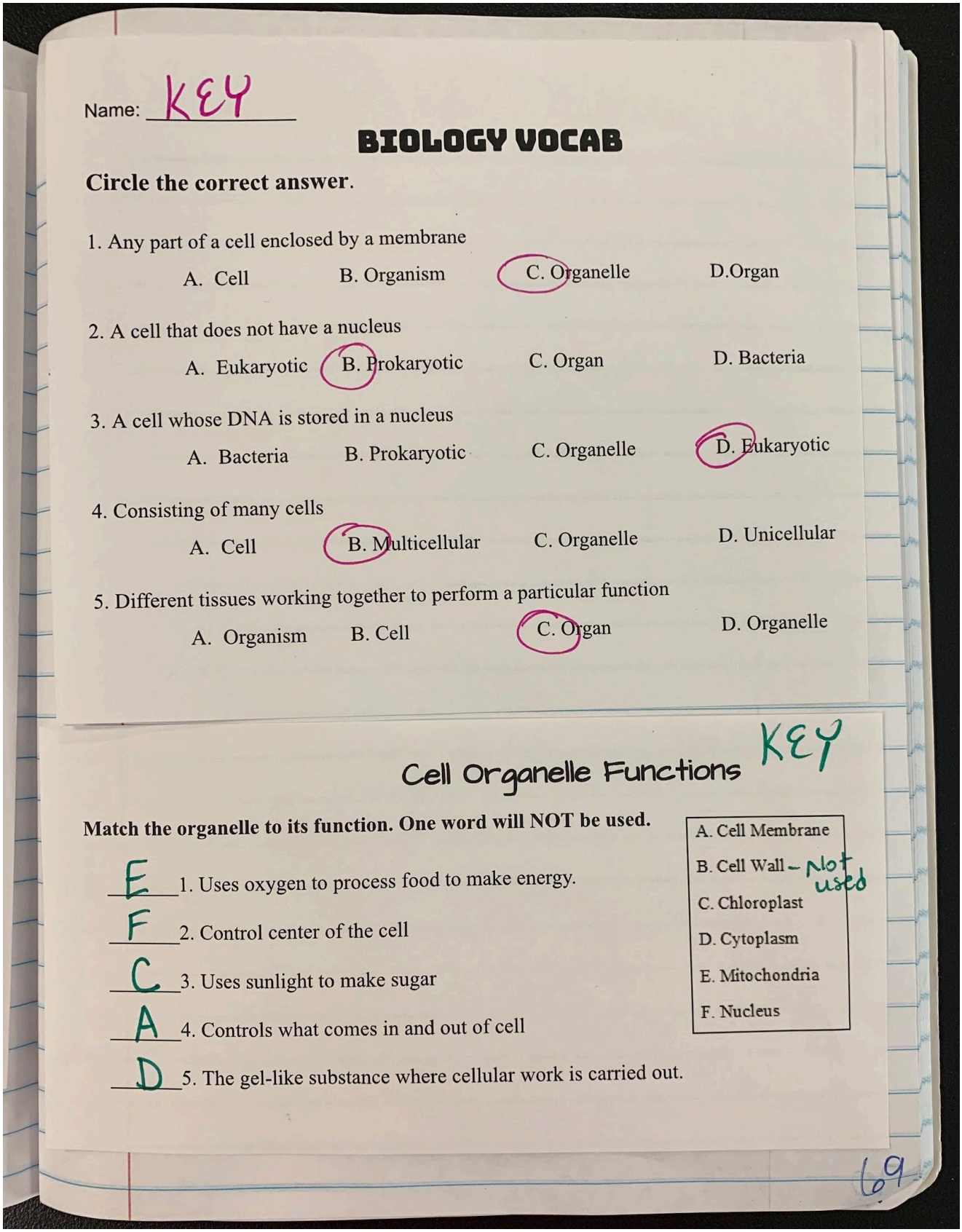
PROKAYOTES VS EUKARYOTES

	Prokaryotic	Eukaryotic
Definition	Cell that has no nucleus	DNA Stored in Nucleus
DNA location	DNA Floats in Cytoplasm	in Nucleus
Organelles	None	Yes
Size	unicellular	unicellular and multicellular
Examples	bacteria & Archaea	plants, animals, fungi and protists
Movement:	1. pseudopodia → Amoeba 2. Cilia → Paramecium 3. flagella → Euglena	

SIMILARITIES

1. Have DNA
2. Have Ribosomes
3. Have Cytoplasm
4. Have Cell Membrane

Biology Warm Ups



Name: KEY

BIOLOGY VOCAB

Circle the correct answer.

1. Any part of a cell enclosed by a membrane

   A. Cell B. Organism C. Organelle D.Organ

2. A cell that does not have a nucleus

   A. Eukaryotic B. Prokaryotic C. Organ D. Bacteria

3. A cell whose DNA is stored in a nucleus

   A. Bacteria B. Prokaryotic C. Organelle D. Eukaryotic

4. Consisting of many cells

   A. Cell B. Multicellular C. Organelle D. Unicellular

5. Different tissues working together to perform a particular function

   A. Organism B. Cell C. Organ D. Organelle

Cell Organelle Functions KEY

Match the organelle to its function. One word will NOT be used.

A. Cell Membrane
B. Cell Wall – Not used
C. Chloroplast
D. Cytoplasm
E. Mitochondria
F. Nucleus

E 1. Uses oxygen to process food to make energy.

F 2. Control center of the cell

C 3. Uses sunlight to make sugar

A 4. Controls what comes in and out of cell

D 5. The gel-like substance where cellular work is carried out.

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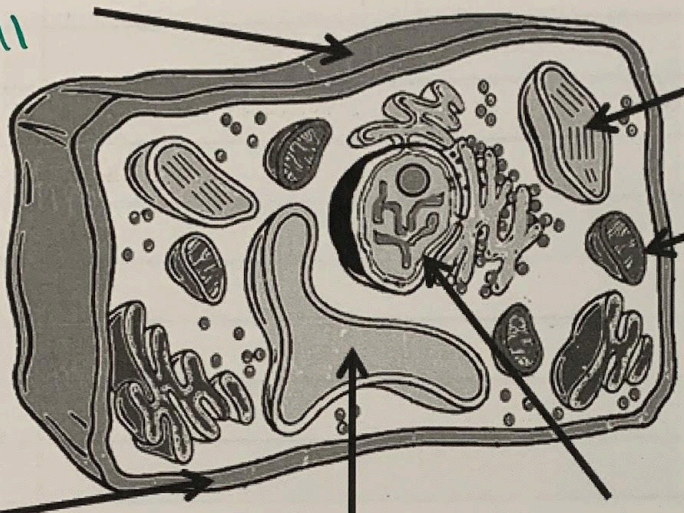
Key

Cell Organelles

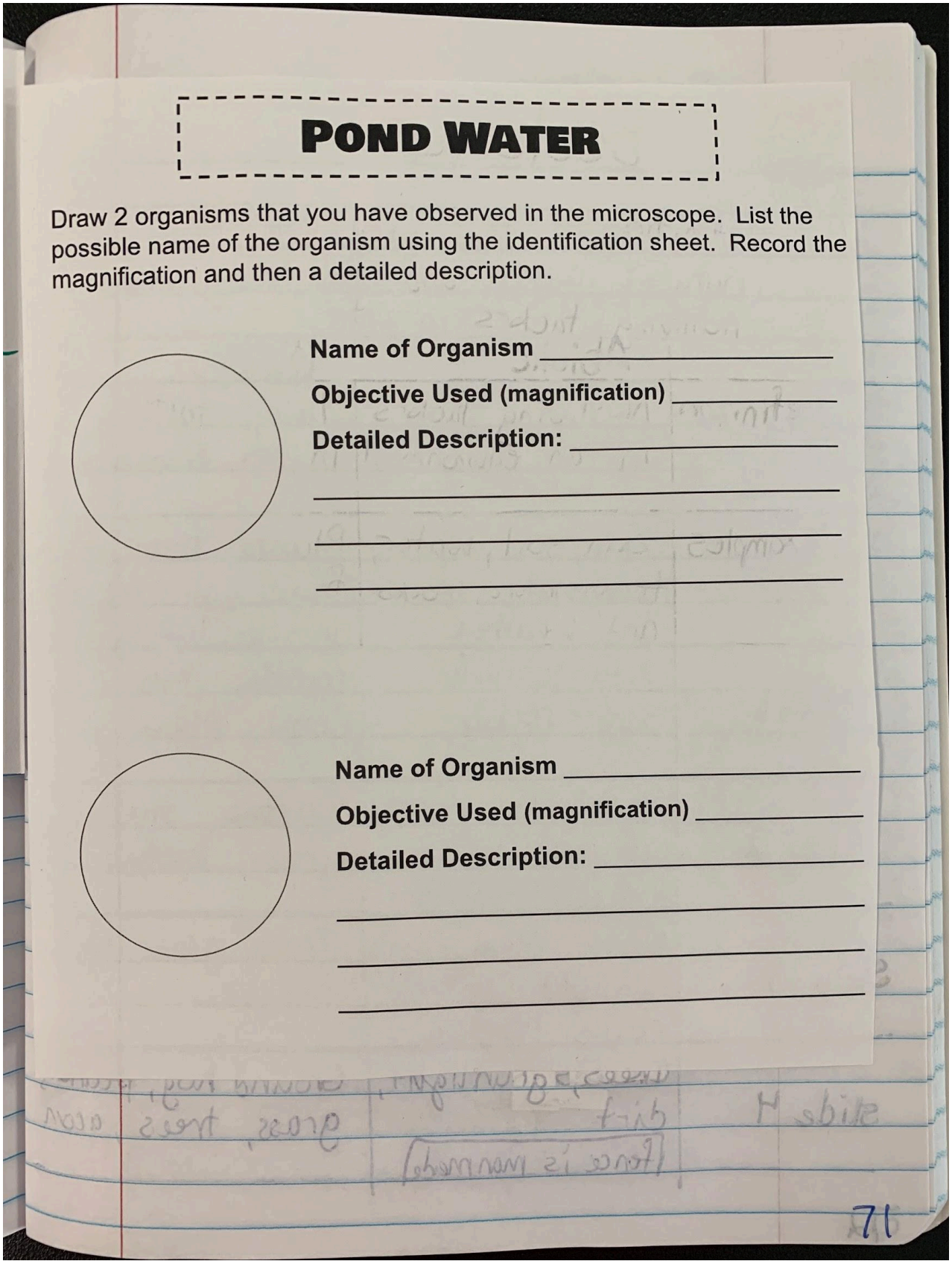
Label the cell using the organelles provided.

~~Mitochondria~~ Chloroplast ~~Nucleus~~

~~Cell Membrane~~ ~~Vacuole~~ ~~Cell Wall~~



Pond Water Observation Lab



POND WATER

Draw 2 organisms that you have observed in the microscope. List the possible name of the organism using the identification sheet. Record the magnification and then a detailed description.

Name of Organism _____

Objective Used (magnification) _____

Detailed Description: _____

_____

_____

_____

Name of Organism _____

Objective Used (magnification) _____

Detailed Description: _____

_____

_____

_____

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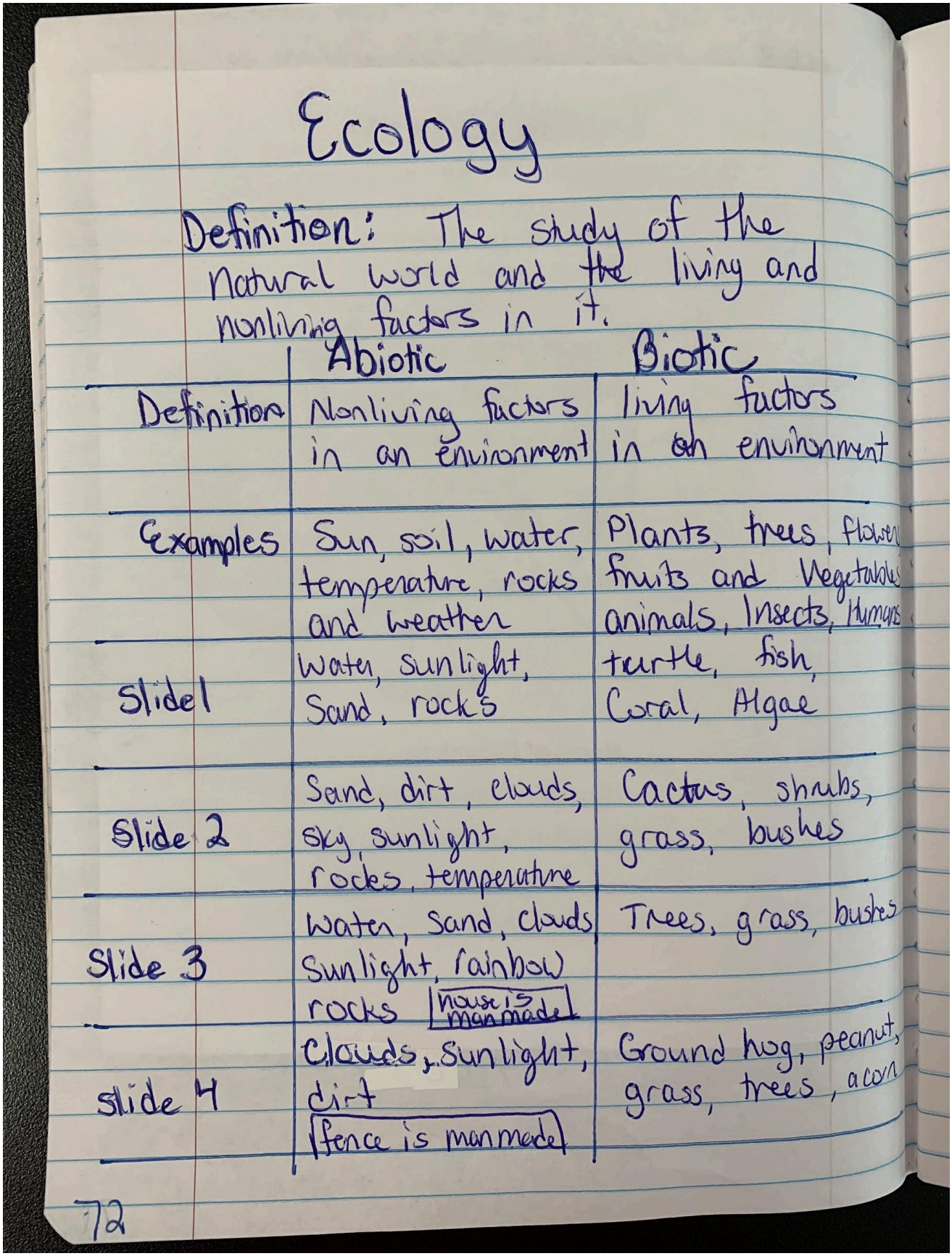
Ecology Abiotic and Biotic Notes



Ecology

Definition: The study of the natural world and the living and nonliving factors in it.

	Abiotic	Biotic
Definition	Nonliving factors in an environment	living factors in an environment
Examples	Sun, soil, water, temperature, rocks and weather	Plants, trees, flowers fruits and Vegetables animals, Insects, Humans
Slide1	Water, sunlight, Sand, rocks	turtle, fish, Coral, Algae
Slide 2	Sand, dirt, clouds, sky, sunlight, rocks, temperature	Cactus, shrubs, grass, bushes
Slide 3	Water, Sand, clouds Sunlight, rainbow rocks [house is man made]	Trees, grass, bushes
slide 4	Clouds, Sunlight, dirt [fence is man made]	Ground hog, peanut, grass, trees, acorn

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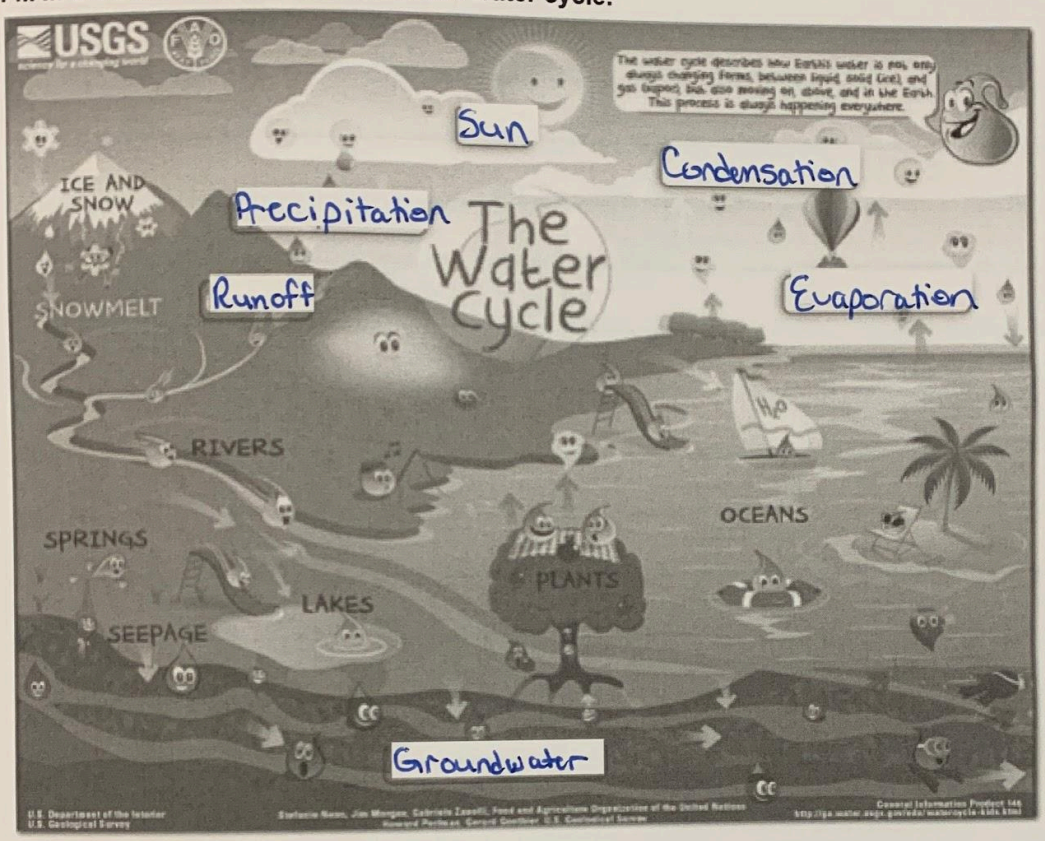
Cycles Notes

What is a CYCLE?

A series of events that happens over and over

WATER CYCLE

Fill in the boxes for each section of the water cycle.



CARBON CYCLE Red Blue

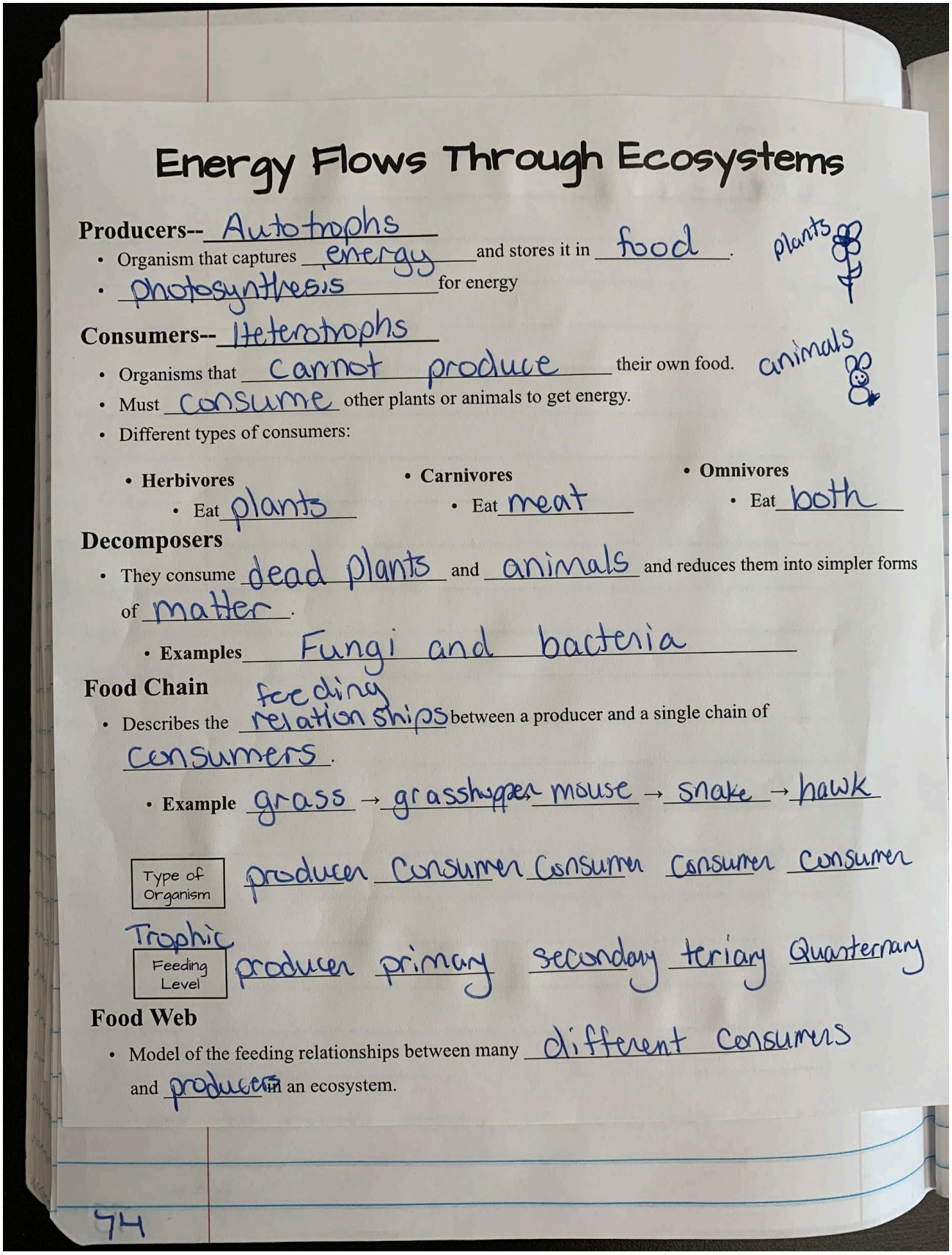
List the ways CO_2 is released into the atmosphere.	List the ways CO_2 is absorbed into the earth.
Burning Fossil Fuels	Dissolved CO_2 in Water
Burning Forrests	Photosynthesis
Respiration (breathing)	Decomposition
Decomposition	Animal & Plant Waste

NITROGEN CYCLE

Plants cannot use pure nitrogen gas. So how does nitrogen from the air get into the soil?

Bacteria & Lightning can fix Nitrogen so it is usable.

Energy Flow Notes



Energy Flows Through Ecosystems

Producers-- Autotrophs

- Organism that captures energy and stores it in food.
- photosynthesis for energy

plants

Consumers-- Heterotrophs

- Organisms that cannot produce their own food.
- Must consume other plants or animals to get energy.
- Different types of consumers:

animals

- **Herbivores**
  - Eat plants
- **Carnivores**
  - Eat meat
- **Omnivores**
  - Eat both

Decomposers

- They consume dead plants and animals and reduces them into simpler forms of matter.
  - **Examples** Fungi and bacteria

Food Chain

- Describes the feeding relationships between a producer and a single chain of consumers.
  - **Example** grass → grasshopper → mouse → snake → hawk

Type of Organism	producer	Consumer	Consumer	Consumer	Consumer
Trophic Feeding Level	producer	primary	secondary	teriary	Quaternary

Food Web

- Model of the feeding relationships between many different consumers and producers in an ecosystem.

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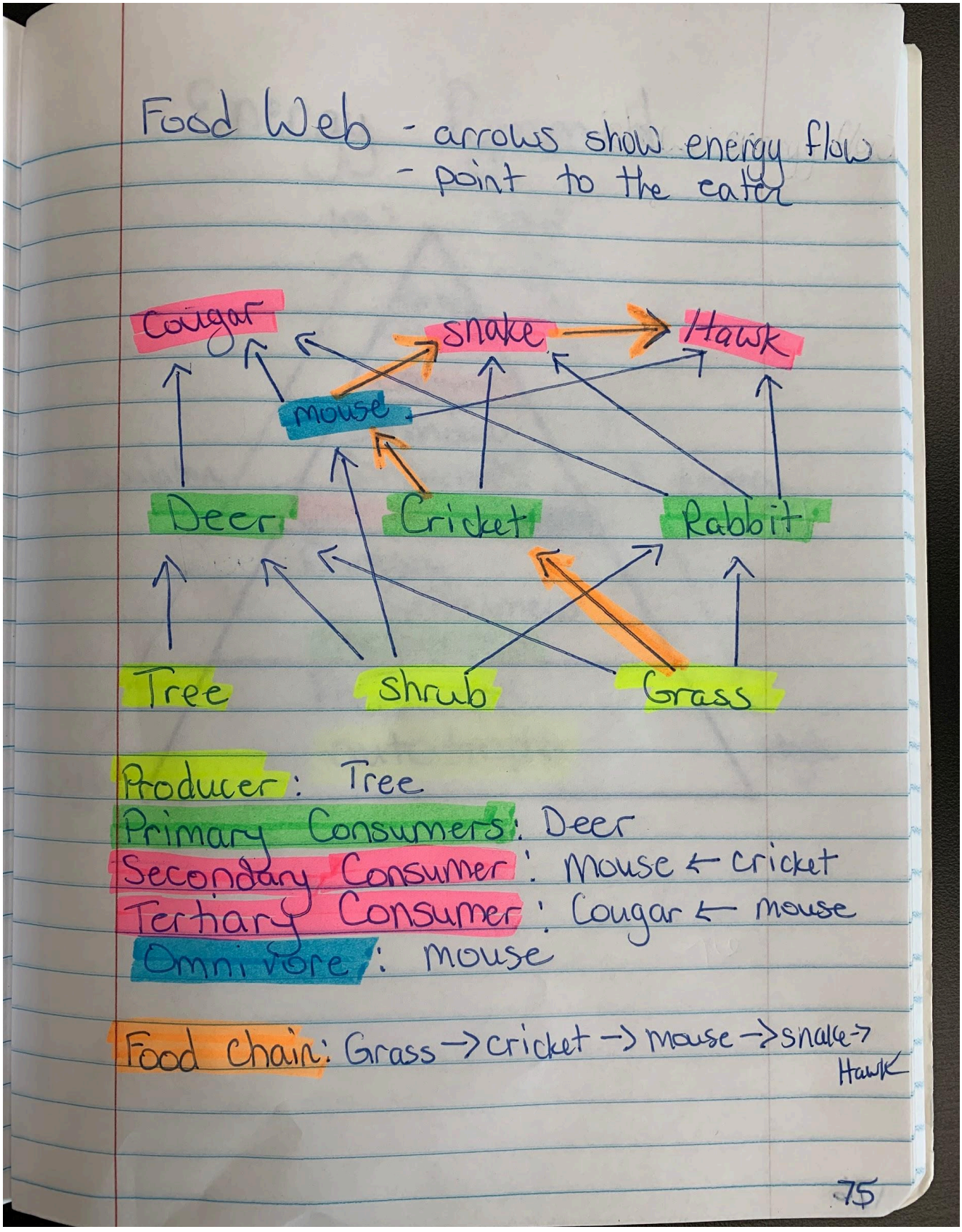
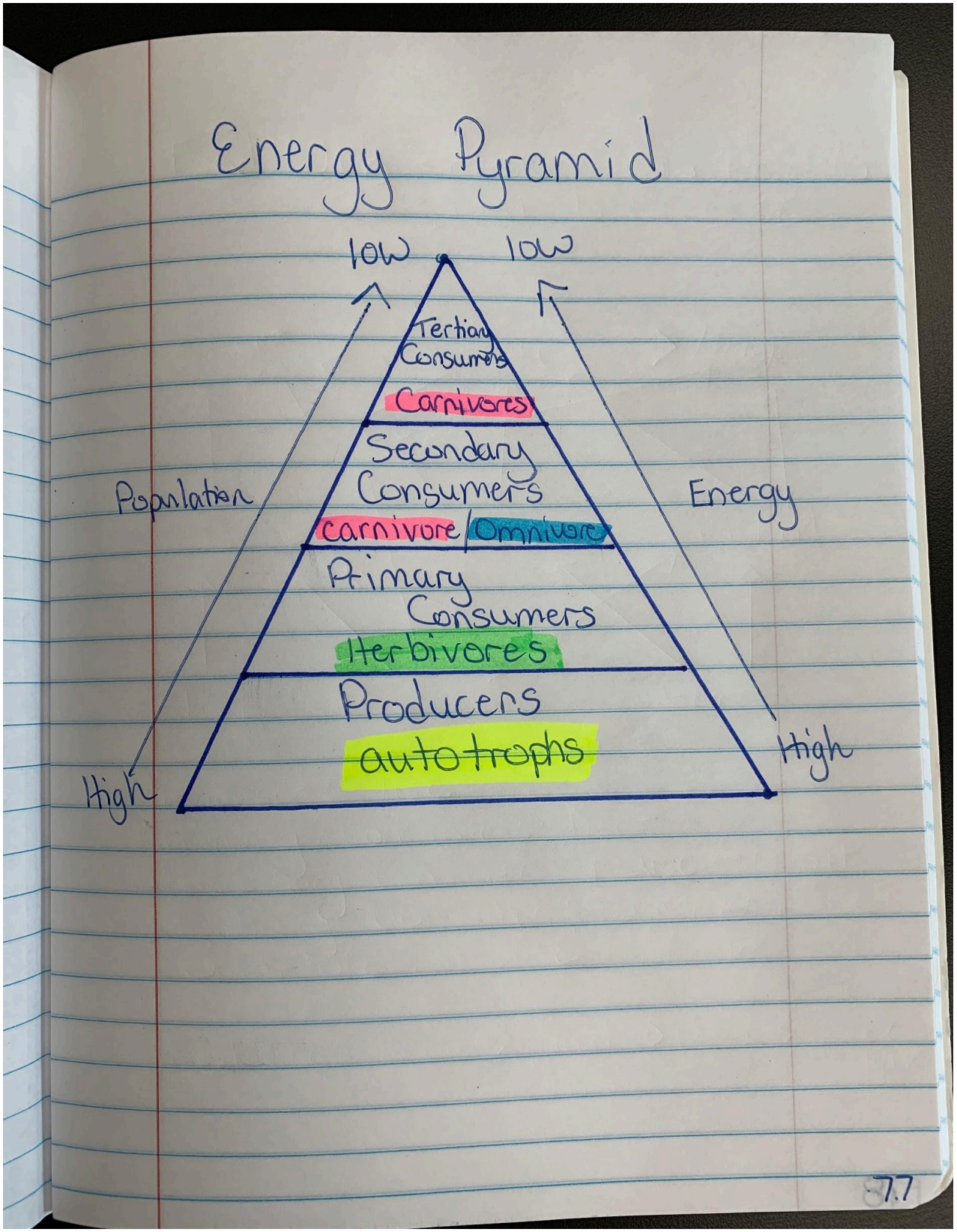
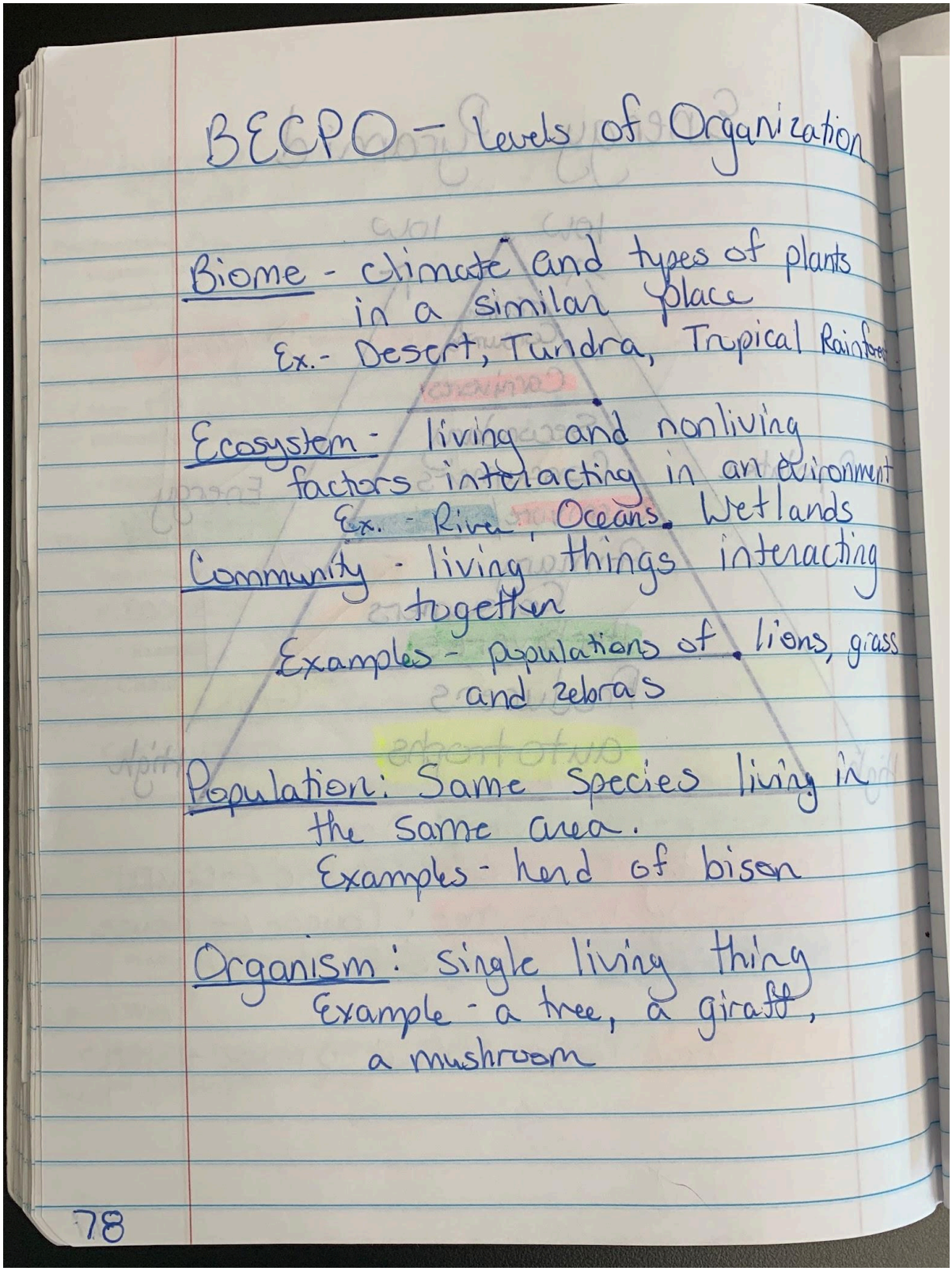
Food Web Example



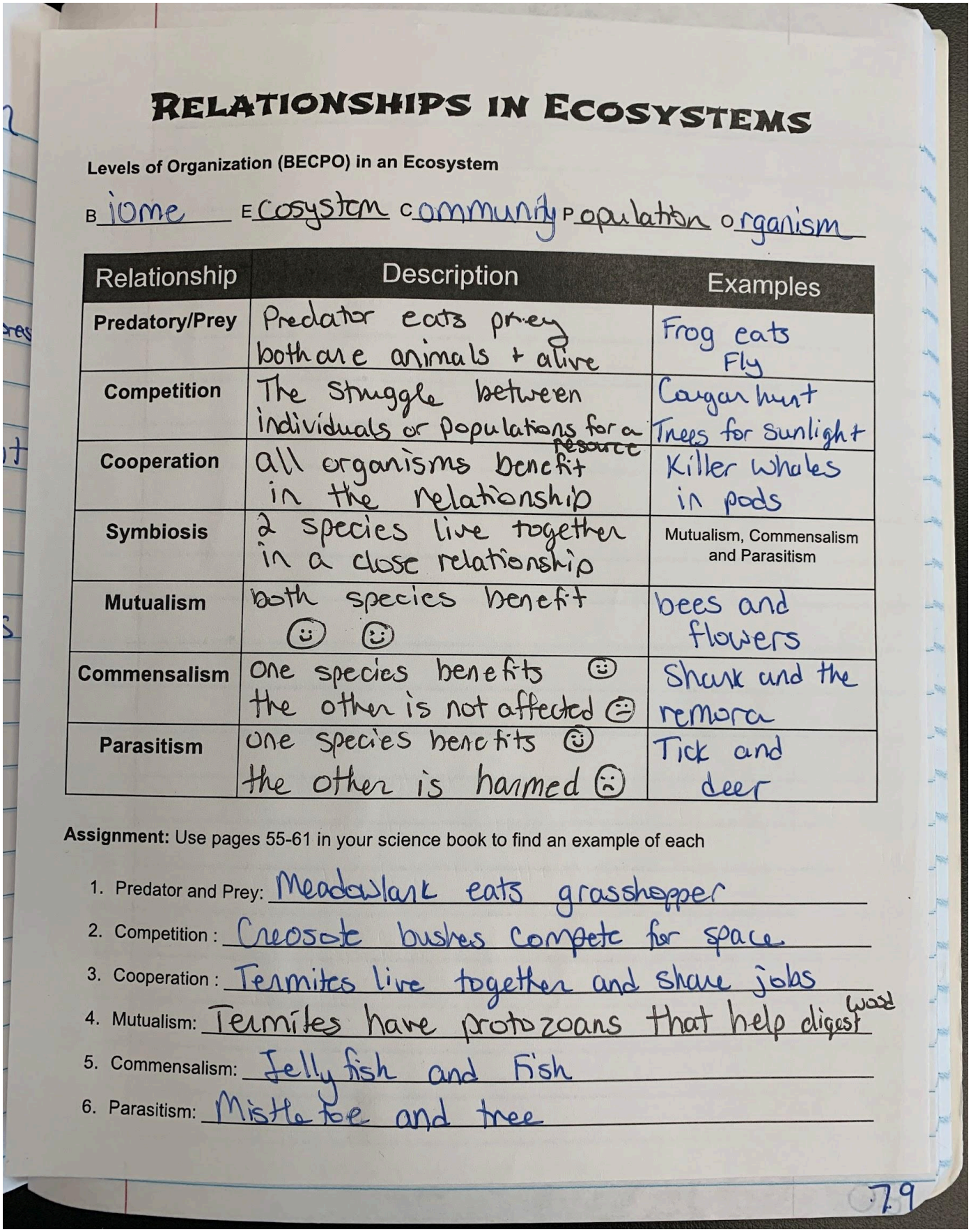
Energy Pyramid Example



BECPO Levels of Organization



Relationships in Ecosystems



RELATIONSHIPS IN ECOSYSTEMS

Levels of Organization (BECPO) in an Ecosystem

B iome E cosystem C ommunity P opulation O rganism

Relationship	Description	Examples
Predatory/Prey	Predator eats prey both are animals + alive	Frog eats Fly
Competition	The struggle between individuals or populations for a resource	Cougar hunt Trees for sunlight
Cooperation	all organisms benefit in the relationship	Killer whales in pods
Symbiosis	2 species live together in a close relationship	Mutualism, Commensalism and Parasitism
Mutualism	both species benefit ☺ ☺	bees and flowers
Commensalism	one species benefits ☺ the other is not affected 😐	Shark and the remora
Parasitism	one species benefits ☺ the other is harmed ☹	Tick and deer

Assignment: Use pages 55-61 in your science book to find an example of each

1. Predator and Prey: Meadowlark eats grasshopper
2. Competition : Creosote bushes compete for space
3. Cooperation : Termites live together and share jobs
4. Mutualism: Termites have protozoans that help digest (wood)
5. Commensalism: Jelly fish and Fish
6. Parasitism: Mistletoe and tree

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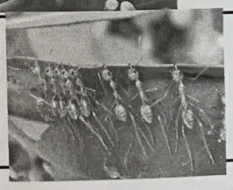
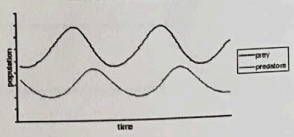
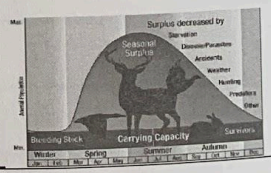
Ecology Vocabulary

ECOLOGY VOCAB KEY

	Definition	Picture
Species	A group of living organisms that can produce offspring	
Population	A group of organisms of the same species that live in the same area	
Community	All the populations that live and interact with each other	
Ecosystem	All the living and nonliving things that interact in an environment	
Biome	Describes the climate and types of plants and animals found in a similar place	
Competition	Struggle between individuals or different populations for a limited resource	
Symbiosis	Relationship between individuals of two different species who live close together.	
Cooperation	Interaction between organisms that benefits them all	
Limiting Factor	Factor or condition that limits population in an ecosystem	
Carrying Capacity	When a population can no longer grow	

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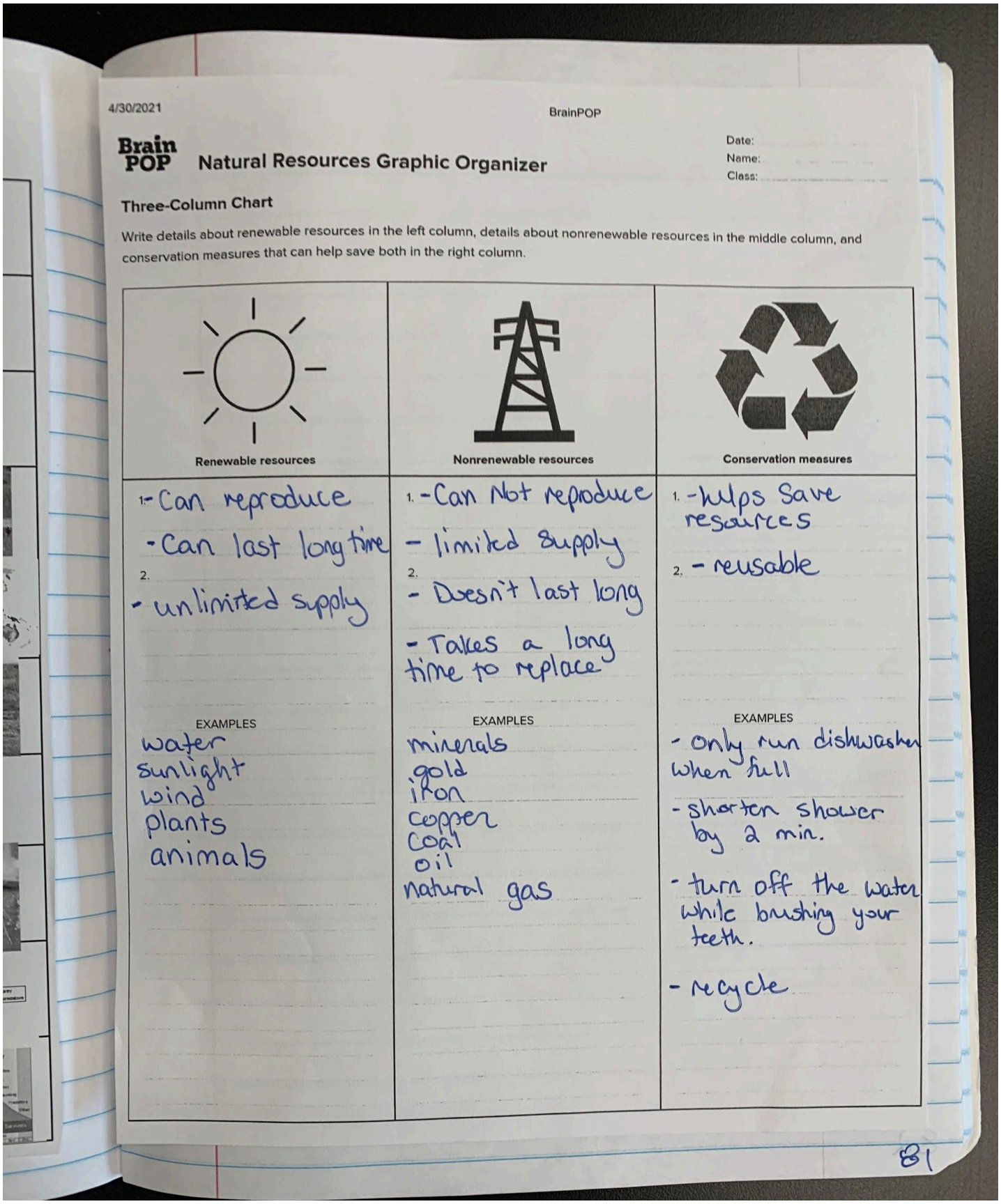
Natural Resources Graphic Organizer



4/30/2021 BrainPOP

Brain POP **Natural Resources Graphic Organizer**

Date:
Name:
Class:

Three-Column Chart

Write details about renewable resources in the left column, details about nonrenewable resources in the middle column, and conservation measures that can help save both in the right column.

Renewable resources	Nonrenewable resources	Conservation measures
1. - Can reproduce - Can last long time 2. - unlimited supply EXAMPLES water sunlight wind plants animals	1. - Can Not reproduce - limited supply 2. - Doesn't last long - Takes a long time to replace EXAMPLES minerals gold iron copper coal oil natural gas	1. - helps Save resources 2. - reusable EXAMPLES - only run dishwasher when full - shorten shower by 2 min. - turn off the water while brushing your teeth. - recycle

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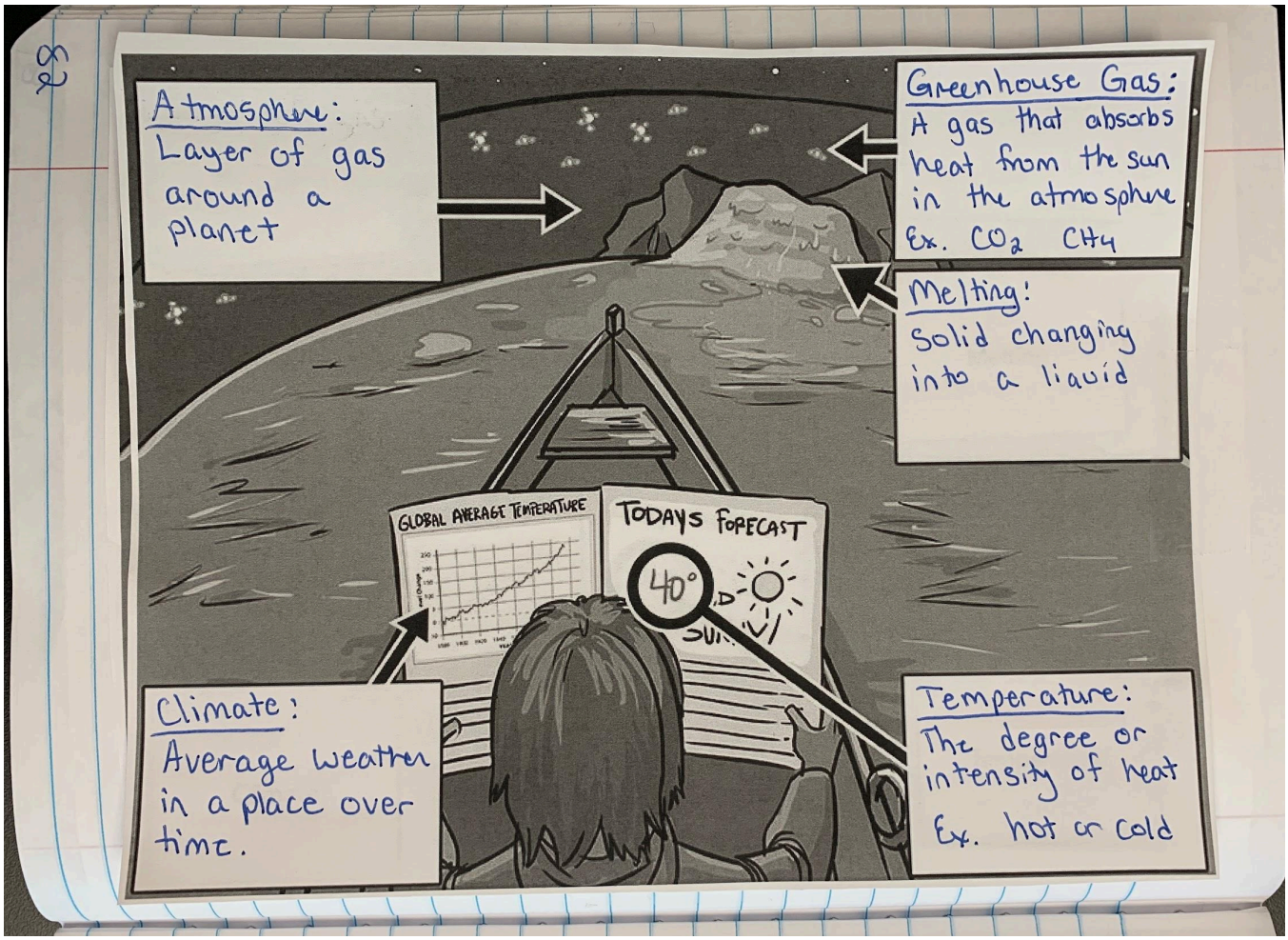
Mosa Mack Climate Change Vocab

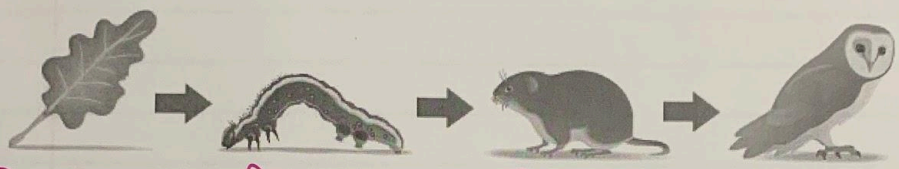


Ecology Warm Ups

Name: Key

Food Chains

Use the food chain to answer the questions.



Producer Primary Secondary Tertiary

1. Label each part of the food chain with the following terms.

   Secondary Consumer, Producer, Primary Consumer, Tertiary Consumer

2. Which organism has the most energy? Producer / Plant
3. Which organism is a herbivore? Primary / Caterpillar
4. Which organism is a carnivore? Secondary or Tertiary Mouse or Owl

Name: _____

ABIOTIC VS BIOTIC

Classify each item as (A) abiotic or (B) biotic or (M) man made

M 1. Car Wheel
B 2. Snail
A 3. Soil
B 4. Mushroom
A 5. Sunshine
B 6. Mosquito
B 7. Bacteria
A 8. Rock
B 9. Maple Tree
M 10. Fence Post

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Name: Key

ECOLOGY VOCAB

A. Abiotic B. Biotic C. Ecology D. Ecosystem

A 1. Nonliving parts of an ecosystem

C 2. Study of how living things interact in an environment

D 3. Living things plus their environment

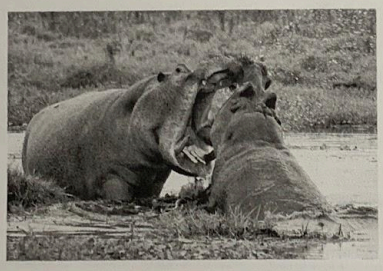
B 4. Living parts of an ecosystem

Label the picture with the choices provided. <u>One choice will NOT be used.</u>

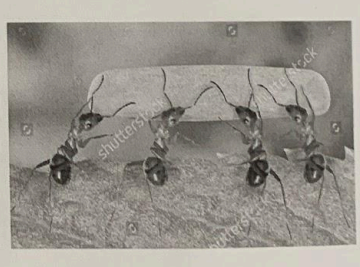
A. Commensalism B. Competition C. Cooperation

D. Mutualism E. Parasitism

1. B



2. C



3. A

4. D

5. Write an example of the choice **not** used.

Parasitism: Ticks, Lice, mites,

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Convection Current Lab

Convection Current Lab

Procedure:

1. Fill two plastic cups, one with warm water and the other with cold water.
2. Snap the small vial (cap-side-up) into the base of the plastic cup, as shown to the right.
3. Gently remove the cap and place 1 drop of food coloring into the bottom of the vial. Carefully and firmly re-cap the vial with the 2 holed cap.
4. Use the syringe to carefully fill the vial with about 5 mL of warm water. Gently tap the vial to remove any air bubbles.
5. Cover both of the holes in the 2-holed cap with two fingers and have another person in your group slowly add cold water to the set-up until it is almost full.
6. Remove your fingers and observe what happens from both the side and the top.

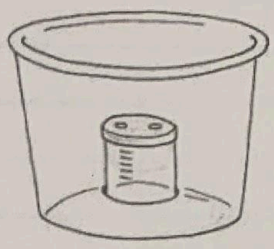


Figure 1: Capped Vial in Cup

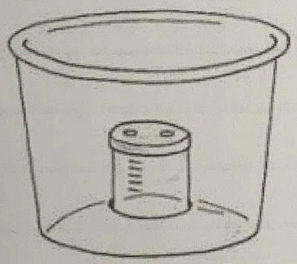
Draw the water movement in the cup using a red pen.

Write your observation:

_____

_____

Repeat steps 3-6, but this time use cold water on Step 4 and warm on Step 5.



Draw the water movement in the cup using a red pen. **Write your observation:**

_____

_____

What can you conclude from this experiment?

_____

_____

_____

_____

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Layers of Earth Notes

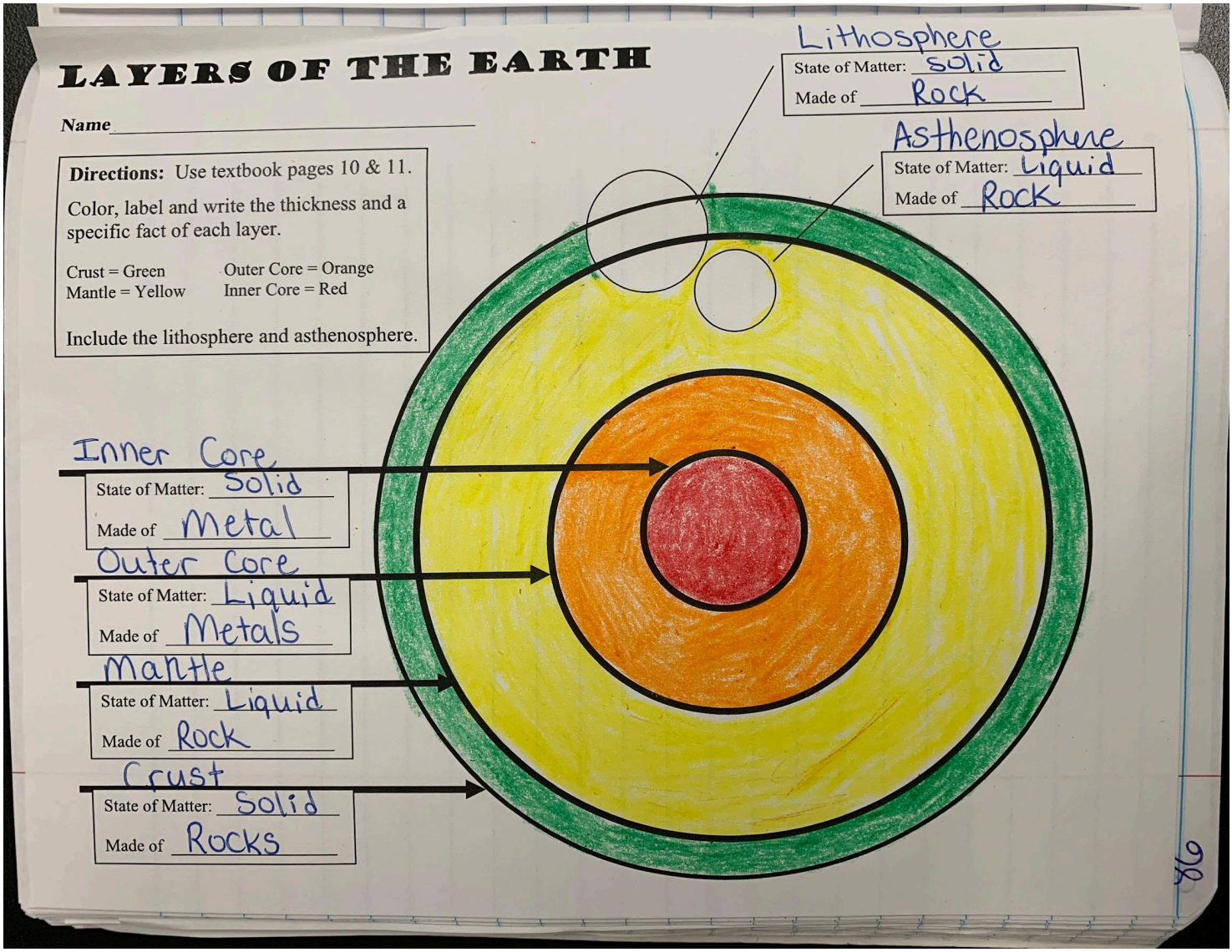
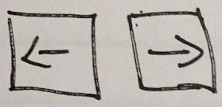
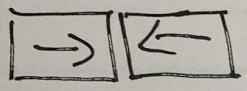
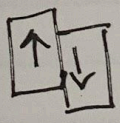


Plate Boundaries Notes

Plate Boundaries

Boundary Type	Description and Drawing	Landforms	Location
Divergent Pg 22-28, 35	Plates move away from each other. 	Ridges Rift Valleys Volcanoes hot spots Earthquakes *Creates new crust	Africa -Great Rift Valley -Mid Atlantic Ridge
Convergent Pg 22, 30-33, 35	Plates push toward each other 	Mountains trenches Volcanoes Earthquakes Subduction *Crust destroyed	European Alps Himalayas Marianna Trench Cascade mtns - oregon + Wash
Transform pg 22, 34-35	Plates scrape past each other 	Mid Ocean Ridge fissures (cracks) Earthquakes *Crust neither Created or destroyed	San Andreas Fault (CA)

Explain how the Hawaiian islands were formed. (pg 27)

Plumes of magma break through the oceanic crust creating an island. The plate moves over the plume and new islands are formed

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