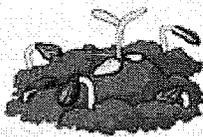


Name: _____

Spheres

EARTH IS DIVIDED YET CONNECTED

	Geo ground	Hydro water	
	Bio life	Atmo air	

DATE:

NAME:
BLOCK:

THREE KINDS OF VARIABLES

In a scientific investigation, there are 3 kinds of variables. An **independent** variable (or **manipulated** variable) is the **one** factor or condition that is intentionally changed by an investigator in an experiment. A **dependent** variable (or **responding** variable) is a factor or condition that might be affected as a result of that change. A variable that is NOT changed is called a **controlled** variable (or **constant**).

Consider the following example below:

A student wanted to test how the mass of a paper airplane affected the distance it would fly. Paper clips were added before each test flight. As each paper clip was added, the plane was tested to determine how far it would fly. The mass of the plane (number of paper clips added) was the **independent variable**. The **dependent variable** was how far the plane flies. A **controlled variable** in the experiment was the fact that the same plane was used for each trial.

Try these:

- (1) Two groups of students were tested to compare their speeds of solving math problems. Each group was given the same problems. One group used calculators and other group computed without calculators.

Independent Variable	
Dependent Variable	
Controlled Variable(s)	

- (2) Students of different ages were given the same puzzle to assemble. The puzzle assembly time was measured.

Independent Variable	
Dependent Variable	
Controlled Variable(s)	

- (3) A study was done to find if different tire types affect the braking distance of a car. All tests were done using a Ford Mustang car.

Independent Variable	
Dependent Variable	
Controlled Variable(s)	

- (4) An experiment was performed to determine how the amount of baking soda could affect the height of muffins. The same muffin pan, baking time, brand name of ingredients, and the same oven were used.

Independent Variable	
Dependent Variable	
Controlled Variable(s)	

DATE:

NAME:
BLOCK:

WRITING HYPOTHESES

A hypothesis is a scientific idea about how something works, before the idea has been tested. Scientists do experiments to test their hypothesis and see if their hypothesis is supported by the data. A hypothesis is often written as an "if-then" statement. (If I do such-and-such, **then** such-and-such will happen **because** of a certain reason.)

Examine the **Independent** and **Dependent** variables given in each question. In the space provided, write a hypothesis describing a relationship between the variables, which could then be tested in an experiment.

(ex) **Independent Variable:** baseball batting practice

Dependent Variable: batting average

Hypothesis: *If a baseball player spends more time at batting practice, then his/her batting average will increase because they have improved their swing speed.*

(1) **Independent Variable:** number of recycling posters put on the school walls

Dependent Variable: amount of aluminum cans deposited in school recycling bins

Hypothesis: _____

(2) **Independent Variable:** amount of passengers in a car

Dependent Variable: money spent on gasoline

Hypothesis: _____

(3) **Independent Variable:** length of time spent studying for a math class

Dependent Variable: letter grade received in math class

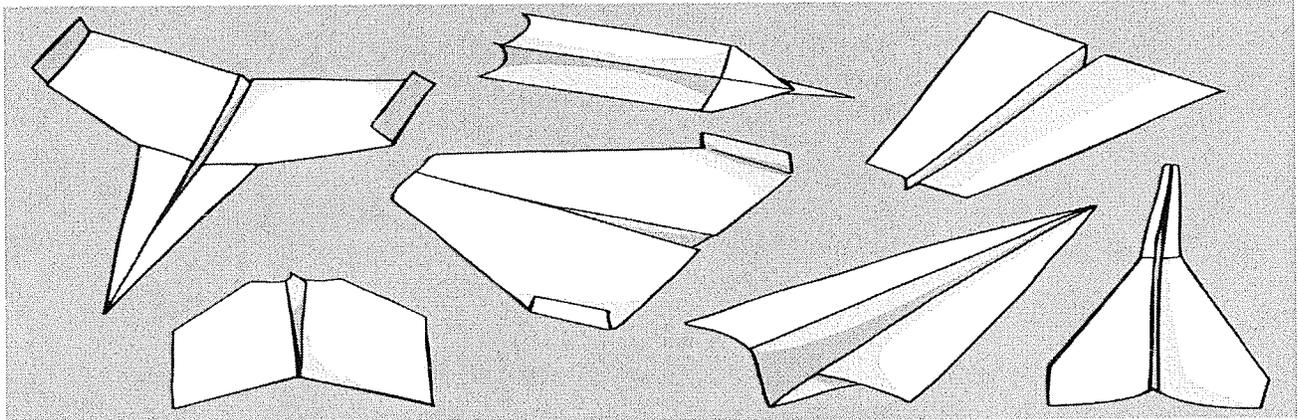
Hypothesis: _____

(4) **Independent Variable:** amount of pop that is consumed

Dependent Variable: number of tooth cavities

Hypothesis: _____

Science 9: Paper Airplane Project



Working with a partner, or alone, you will design and conduct an experiment to test a hypothesis that you come up with. Your project must be organized with the same headings and in the order as follows:

Lab Report:

- Your **Names and Date** at the top of the report
- **Title** of the experiment
- **Observations and Question:** Fold some different paper airplanes (Google to find some) and observe how they fly. Use your observations to **form and write down a question** that you hope to answer by the end of the experiment.
- **Hypothesis:** Write down a prediction for the outcome of your experiment question. Use the “if... then...” format and make sure that your experiment is testable. (Example hypothesis: If more paper clips are added, then the airplane will fly further. ← May or may not be true; it is just your guess. Don’t use this as your experiment; think of something else. 😊)
- **Materials:** A bulleted list of all the materials you are using.
- **Procedure:**
 - Begin by identifying all three types of variables for your experiment (**independent, dependent and controlled**). Be sure include as many controlled variables as possible. Write all your variables down.
 - Design an experiment that will help determine whether your hypothesis is correct. Write out **ALL** the steps you need to follow to do the experiment. Remember to include multiple trials of your experiment to make the data more accurate.

(Your procedure should read like a recipe, and anyone/everyone should be able to easily follow it. Others must be able to repeat **EXACTLY** what you have done, including the steps taken to set up your experiment and how to record the data. **BE CLEAR!**)

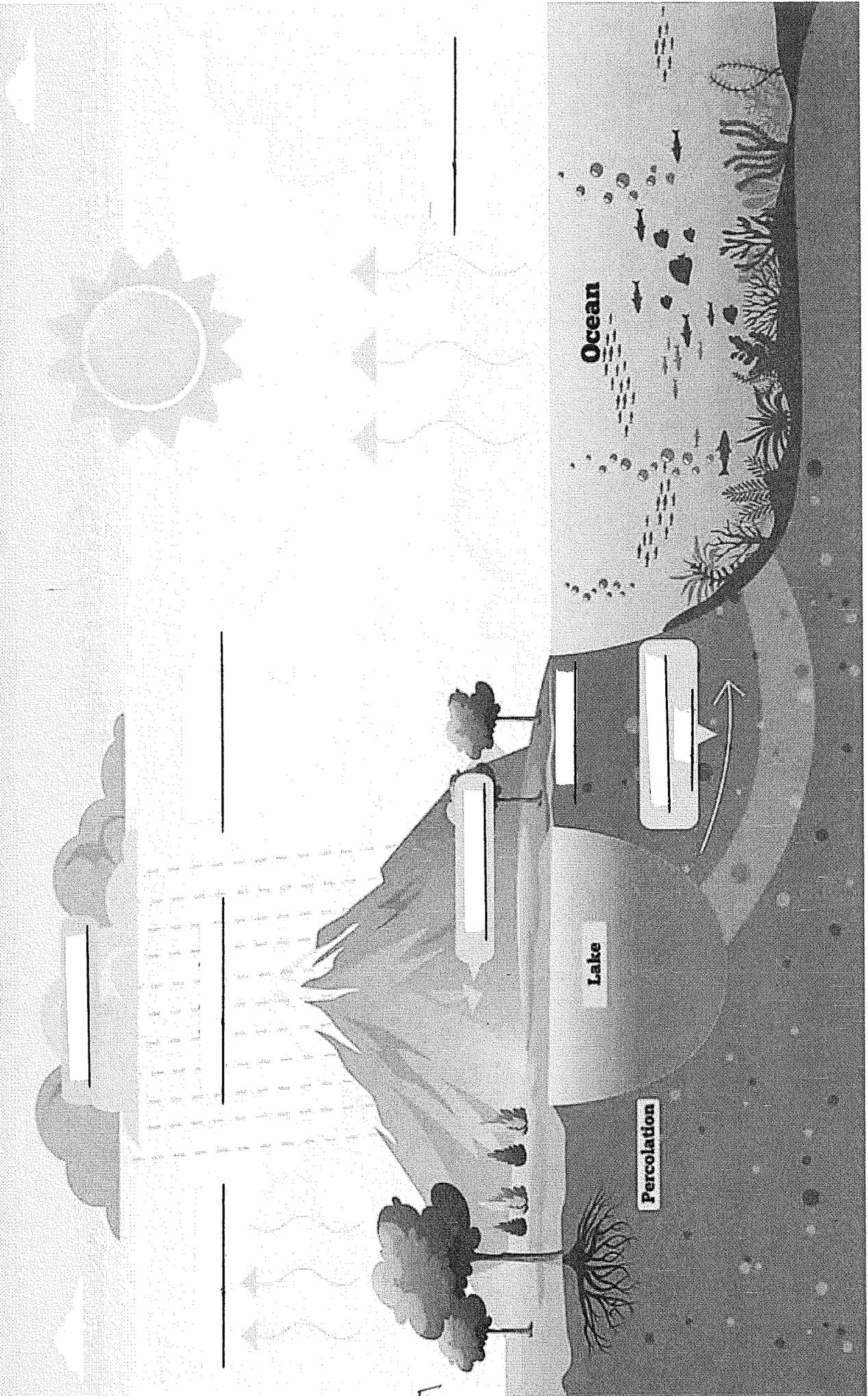
- **Results (Quantitative and Qualitative Data Collection):** Record both qualitative and quantitative data **for each trial** of your experiment. Create a data table for quantitative data and write out your qualitative data in a sentence or two from each trial. Do not add any “I think” statements here, just summarize what you see.
- **Data Analysis:** Show your quantitative data in a table or graph. Show an example of any calculations.
- **Conclusion:** (Five parts to include.)
 1. Re-state your hypothesis.
 2. Summarize your data with specific numerical evidence.
 3. Does your data support or reject your hypothesis? (Include numerical evidence.)
 4. Errors/conditions that may have affected your results? (NOT human error.)
 5. Where would you go from here? Additional or new tests you would perform due to your results.

This assignment can be completed with a partner or individually.

Your final project will be due on: _____



The Hydrologic Cycle (Water Cycle)



BC Floods in Fall 2021

Write an article/PowerPoint/comic strip/song/etc. about the flooding that happened in BC in the Fall of 2021.

You may choose one area of BC to focus on since many areas were affected.

Include:

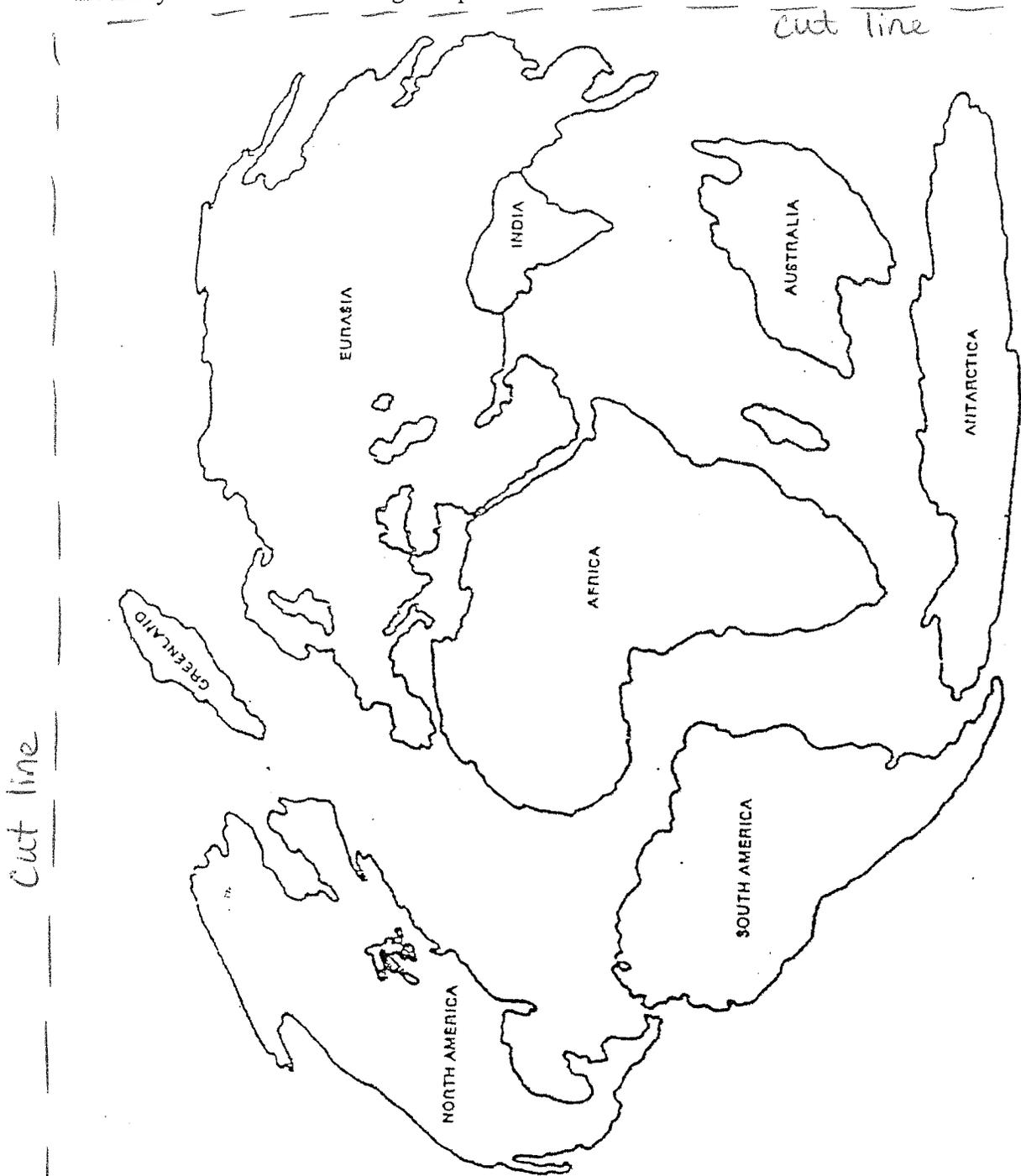
- Where, what, and why it happened? Who affected?
- Will the flooding that happened last year affect us this year? Further into the future?
- Include information about other major floods in BC's history. How often do they happen here?
- Pictures.

Hand in tomorrow.

Paste "Pangea" here:

Pangea Cut & Paste

Cut all the continents apart. You'll need to cut India separate too. Use *the internet* to paste the pieces back together in the form they were 200 million years ago in the Early Mesozoic as the Pangea supercontinent.

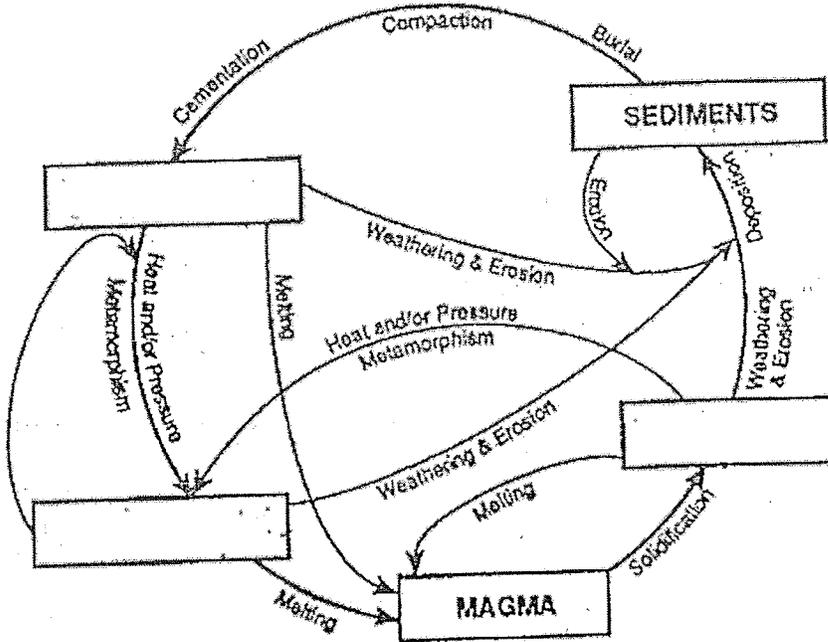


Rock Cycle Notes

Rock Cycle Worksheet

1. Fill in Sedimentary, Igneous or Metamorphic in the empty boxes.

Rock Cycle in Earth's Crust



Complete the following sentences:

1. As magma cools, it forms _____ rock by the process of _____.
2. Igneous rocks can form _____, _____ and _____ rocks.
3. Sediments form _____ rocks by the process of _____.
4. Sediments form from the process of _____.
5. Sedimentary rocks can form _____, _____ and _____ rocks.
6. Which process changes igneous rock into metamorphic rock?
7. Which process changes sedimentary rock into igneous rock?
8. Which process changes metamorphic rock into sedimentary rock?

9. Metamorphism involves the addition of _____ and _____ to pre-existing rocks.

10. Compaction & cementation of sediments forms _____ rocks.

11. Subjecting sedimentary rocks to extreme heat & pressure forms _____ rocks.

12. Solidification of molten materials forms _____ rocks.

13. Deposition and burial of sediments forms _____ rocks.

14. Heat and pressure acting on igneous rocks forms _____ rocks.

15. To form magma what must happen to sedimentary, metamorphic or igneous rocks?

_____.

16. Why do you tend to find lots of fossils in sedimentary rocks? Why not in other rocks?

_____.

17. Define Igneous rocks

_____.

18. Define Sedimentary rocks

_____.

19. Define metamorphic rocks

_____.

20. Which is your favourite type of rock?

_____.

Rock Identification Lab

How to identify the different types of rocks: <https://youtu.be/R5Qz2Zil3dQ>

PREFACE:

After collecting five rocks we will attempt to identify which type of rock it is based on its physical characteristics. Note that scientist have classified all rocks into three categories: Igneous, sedimentary, and metamorphic. These are not categories based on colour or shape, but on how they are formed.

These points may help you with the lab:

- **Sedimentary rocks** are sometimes made of small particles compacted and cemented together.
- **Igneous rocks** often have crystals of minerals visible, and the minerals appear to be interlocking.
- **Metamorphic rocks** are created under a great deal of pressure, causing them to have thin, flat layers that are easily visible.

MATERIALS:

The five rocks you found

Magnifying glass (optional)

Water

PROCEDURES:

1. Do your own **research** on the three categories of rocks to create your own classification system. You will use your research to try to classify each of your rocks into one of the three categories. Include links to the websites you used while researching.
2. Go outside and collect 5 rocks that are approximately fist sized.
3. Once back in the classroom label your rocks #1-5 then describe the characteristics each. Work as a group to check each other's details.
 - What colours are in the rock and are they dull or shiny?
 - Texture: (your research should have provided you with different textures)
 - Are there any patterns? If so, what do they look like?
 - Other observations:

ROCK	Colours	Texture	Patterns?	Other Observations
#1				
#2				
#3				
#4				
#5				

4. Now classify each rock as igneous, sedimentary, or metamorphic based on your research.

Rock #1: _____.

Rock #2: _____.

Rock #3: _____.

Rock #4: _____.

Rock #5: _____.

5. Which characteristics did you use to classify igneous rocks?

6. Which characteristics did you use to classify sedimentary rocks?

7. Which characteristics did you use to classify metamorphic rocks?

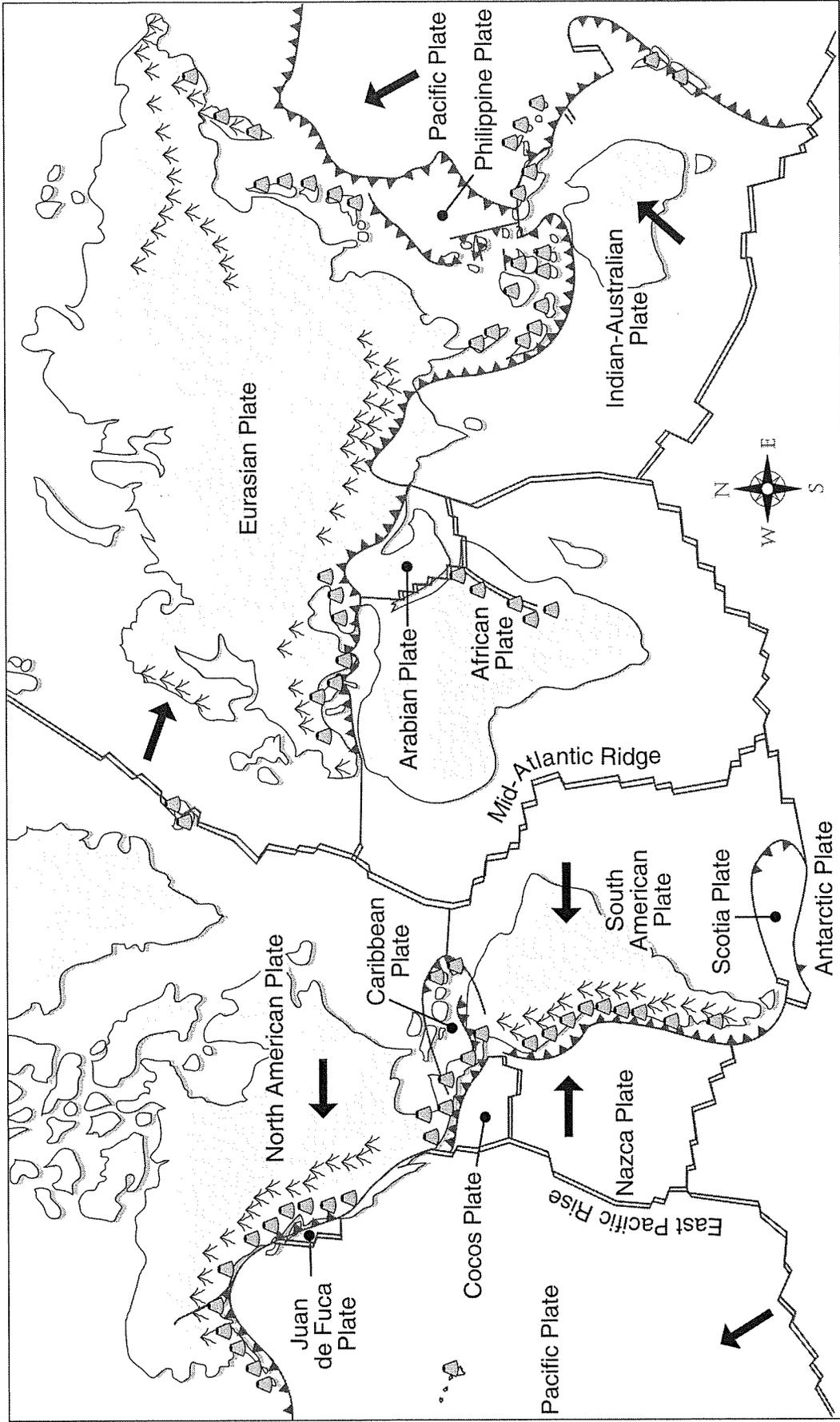
8. Were there any rocks you were unable to classify? If so, describe their characteristics. Why were you unable to identify this rock?

9. Use the internet to try to identify which specific rock each of your five rocks are (ex: shale, granite etc.)

10. One of the oldest rocks on Earth is found in Canada. Which province can this rock be found? How old is it? What type of rock is it?

Volcano + Earthquake Notes

WORLD TECTONIC PLATE BOUNDARIES MAP



- Divergent boundary
- Convergent boundary
- Transform boundary
- Plate movement relative to the African Plate
- Plate movement relative to the African Plate
- Mountains
- Volcanoes

Atmosphere Magazine

We have studied the Geosphere and now you will investigate the Earth's Atmosphere. The dictionary definition of atmosphere is "the envelope of gases surrounding the earth." *Atmos-* is Greek for 'vapor' and *-sphere* for 'globe'. But today you get to do your own investigation of the major sections of the atmosphere. Hence, you will create a DETAILED magazine with four pages. Here are the topics for each page . . . Feel free to use lots of diagrams/charts to help your explanations!

Page 1: The Layers of Gases Surrounding Earth

- include the names and heights of each atmospheric layer
- add the highest location reached by Virgin Galactic & Blue Origin
- provide numerous places of unique "things" in layers

Page 2: Clouds/Precipitation

- explain the types of clouds
- demonstrate how clouds are formed and move
- describe the different kinds of precipitation that can come from the clouds

Page 3: Meteorology/Weather

- simplified explanation of our weather and why we have it (fronts, Coriolis, seasons)
- teach about different events (like hurricanes)

Page 4: Curiosity Questions

- as you are providing DETAILED notes you will come across questions you might be interested in further investigating. RECORD the questions. There should be at least 6.
- also record the question "How do human's affect the atmosphere?"

Remember this is NOT aimed to be of "middle school" level. Later you will add more so leave space - especially between the questions on page 4.