Student Name:_____

Group Members: _____

2020 Western Colorado Elementary Science Fair

Student Guided Packet

Testable Question:

- How does _____ affect _____?
- What is the effect of _____ on _____?

Example Questions:

- **What is the effect of the type of ball on how high it will bounce?**
- What is the effect of temperature on the density of an egg in water?
- What is the effect of size on how high a kite can fly?
- What is the effect of amount of light on how tall a plant will grow?
- What is the effect of amount of water on how tall a plant will grow?
- What is the effect of type of nail polish on how long it lasts without chipping?
- What is the effect of time spent exercising on heart rate?
- What is the effect of time of day on the number of birds observed in a tree?
- What is the effect of fish body size on how fast it swims?
- What is the effect of propellor size on how fast a pinwheel spins?
- What is the effect of hair color on a person's height?
- What is the effect of size shoe on a person's height?
- What is the effect of temperature on time it take bread to grow mold?
- What is the effect of height on blood pressure?

My testable question is…

Purpose:

- Why is your question important to answer? How will it impact humans and society?
    - Sentence Starters:
        - Researching this topic is important, because…
        - This research can be applied to…
        - Finding an answer to this question will impact society, because…
        - This research can be used by scientists for…
        - For example…
    - Example:
      This research is important because it can help athletes when they play different sports, by understanding how the material of the ball changes how it acts. This information can also be used by engineers, to understand what material is bouncier than others, when creating different machines/things that might fall. For example, if engineers are creating mats to put under rock climbers, this research can be applied to understand which material would create less force when colliding.

Independent Variable:(Cause, the thing you are changing and testing)

Example: Type of ball

Dependant Variable: (Effect, the thing you are measuring)

Example: Height it bounces

Controls: (What stays the same)

Example: Tape Measuring, height the ball is dropped

Hypothesis (educated guess):

- (If IV, then DV, because… prior knowledge or background research):
  Example: If different types of balls are bounced, then the height it bounces will change, because different sporting balls are made of different materials, and different materials have different elastic properties.

Materials:

- What materials do you need to conduct this investigation?
  Example:
  - 1 Football
  - 1 Basketball
  - 1 Baseball
  - 1 Tennis Ball
  - 1 Tape Measurer
  - 1 Roll of Tape

Procedure:

- Write out detailed steps for what you will need to do to conduct your investigation. (This is similar to a cooking recipe, so be sure to be as detailed as possible!
    - Example:
        1. Collect all required materials.
        2. Tape the measuring tape to the wall, with 0 being at the bottom.
        3. Take a football, and position it so the bottom of the ball is 3 feet off the ground. Drop the ball and measure how high, in feet, the ball bounced up. Measure from the bottom of the ball.
        4. Record the bounce height in the data table.
        5. Repeat steps 3-4, using a basketball, baseball, and tennis ball.

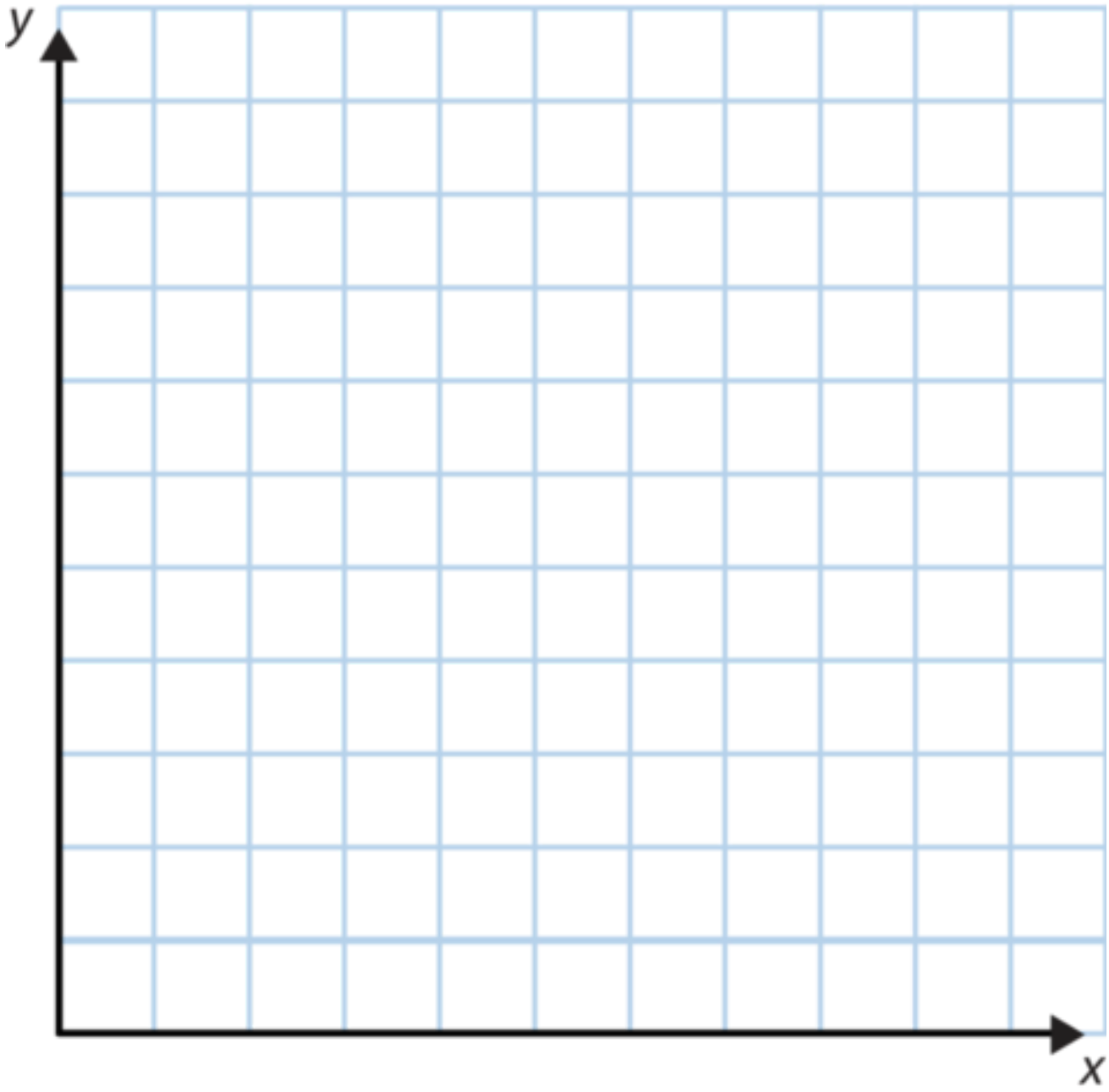
Data Table:

- Create a data table for you to record your observations and data.
  - Example:

Type of Ball	Bounce Height (ft)
Football	1.5
Basketball	3.5
Baseball	1.0
Tennis Ball	4.5

Graphs:

- The IV should be on the X-axis and DV on the Y-axis. Be sure all numbers are written with a constant interval.



Analysis and Conclusion:

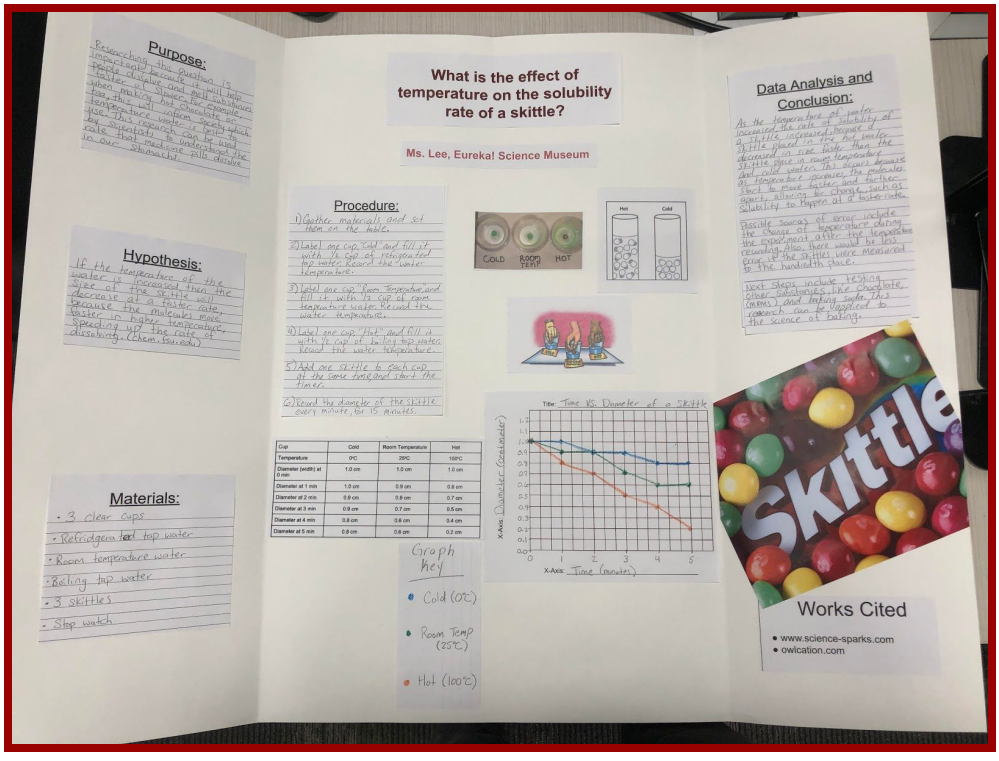
- This paragraph summarizes your findings and results.
  - Sentence Starters:
    - The data shows…
    - Observations during the experiment were…
    - Based on the data, the hypothesis was…
    - Possible sources of error are…
    - If this experiment were repeated, _____ would be changed, because…
  - Example:
    - The data shows that different types of sporting equipment bounces at different heights. Observations during the experiment were that the tennis ball bounces the highest, and the baseball bounces the lowest. Based on the data, the hypothesis was supported. Possible sources of error include the 4 different balls being different sizes and weights. Also, it was challenging getting the bounce height because the balls dropped so quickly. If this experiment were repeated, the number of trials would be changed, because it would be more accurate to bounce each ball multiple times, and then calculate the average.

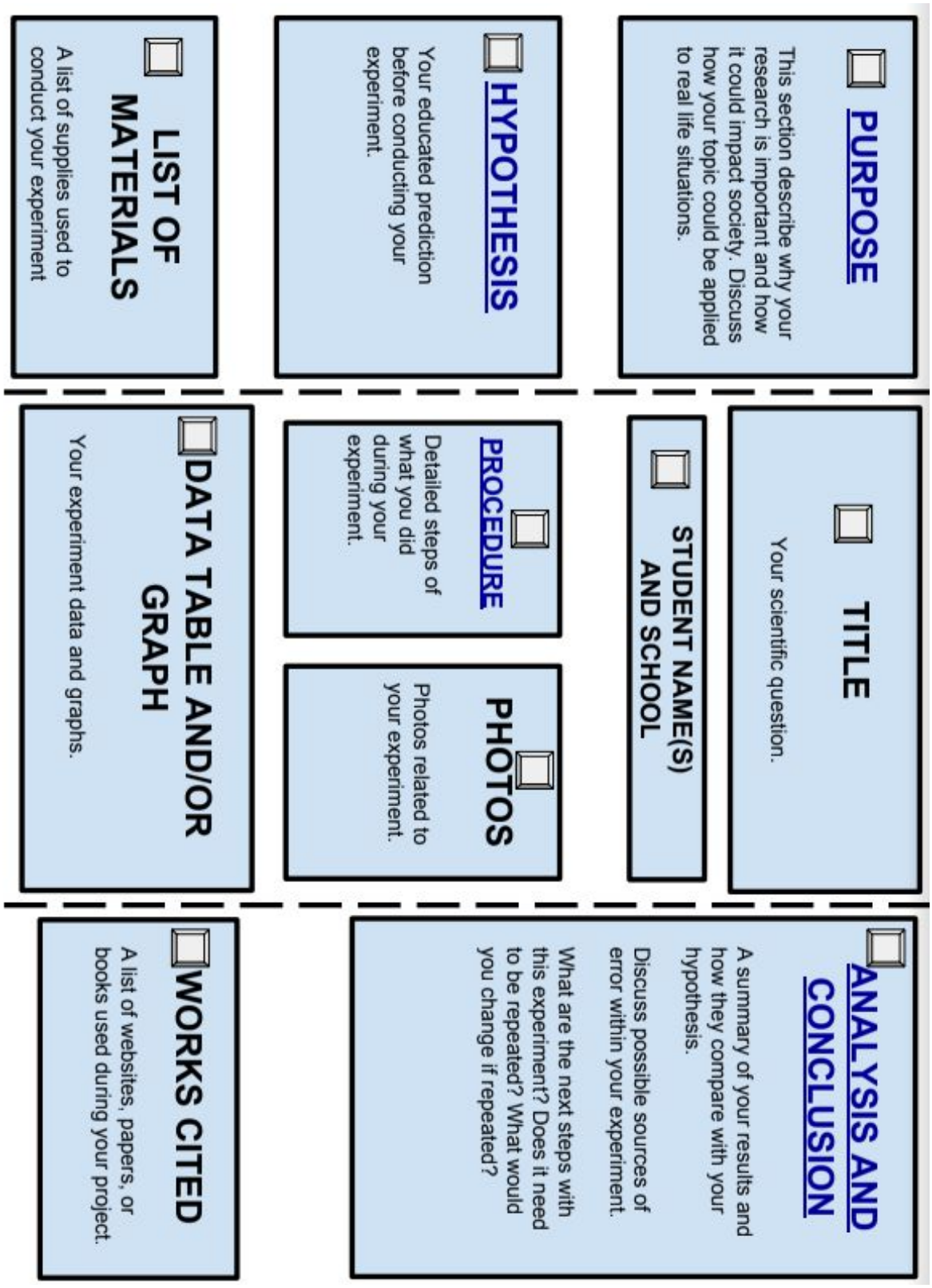
Works Cited:

- List any websites or books you took information of images from.

Poster:

- Each section you previously wrote will need to be typed up, printed, and glued to a tri-fold poster board.
- There should be no spelling or grammar mistakes, and papers need to be cut as straight as possible.
- All fonts should be easily read, with a font size of at least 25.
- All poster sections need to be placed using the diagram below.
- Images are important, and can either be photos you take from the experiment, photo data, or images that relate to your investigation.




PURPOSE
This section describe why your research is important and how it could impact society. Discuss how your topic could be applied to real life situations.
HYPOTHESIS
Your educated prediction before conducting your experiment.
LIST OF MATERIALS
A list of supplies used to conduct your experiment
TITLE
Your scientific question.
STUDENT NAME(S) AND SCHOOL
PROCEDURE
Detailed steps of what you did during your experiment.
PHOTOS
Photos related to your experiment.
DATA TABLE AND/OR GRAPH
Your experiment data and graphs.
ANALYSIS AND CONCLUSION
A summary of your results and how they compare with your hypothesis.
Discuss possible sources of error within your experiment.
What are the next steps with this experiment? Does it need to be repeated? What would you change if repeated?
WORKS CITED
A list of websites, papers, or books used during your project.