Unit 1: Lab Safety and Scientific Method Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Learning Target**  **How would you rate yourself?**  **I can identify and explain parts of an experiment.** | | Score |
| **Beginning 1** | I can identify parts of an experiment, but can’t yet explain their importance. |  |
| **Approaching 2** | I can identify and explain 3-4 parts of an experiment. |  |
| **Proficient 3** | I can differentiate and explain all parts of an experiment. |  |
| **Advanced 4** | I can design an experiment that uses the variables correctly. |  |

Jacob, a gardener, wondered if a particular tree would grow better in the sun or in the shade. Without collecting information or doing much research, Jacob claimed that if he could limit the amount of sunlight the tree was exposed to then the tree would grow taller. To test this idea, Jacob planted 10 trees in a shady area and 10 trees in an area with a significant amount of sunlight. Over the next several months, Jacob watered and fertilized each tree in the exact same way. He also took measurements of the tree’s height. The data he took is below.

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| **Month** | **Height of Tree in Sun (m)** | **Height of Tree in Shade (m)** |
| April | 0.2 | 0.2 |
| May | 0.5 | 0.5 |
| June | 0.8 | 0.7 |
| July | 1.1 | 0.9 |

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| 1. **Define** the parts of an experiment.   Control Group:  Experimental Group:  Independent variable:  Dependent variable:  Constant(s): |
| 1. Using the story above, **identify** the **parts** of the **experiment**.   Control Group:  Experimental Group:  Independent variable:  Dependent variable:  Constant(s): |

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| 1. Jacob wanted to find the difference between trees grown in the sun and shade. Now, he wants to find out the difference between trees grown in the sun versus trees grown in a greenhouse. Design an experiment for Jacob by correctly identifying **all the variables** **(all the parts of an experiment)** and draw a picture of the set up. |

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Mr. Marks thinks that a special juice will increase the productivity of workers. He creates two groups of 50 workers each and assigns each group the same task (in this case, they're supposed to staple a set of papers). Group A is given the special juice to drink while they work. Group B is not given the special juice. After an hour, Mr. Marks counts how many stacks of papers each group has made. Group A made 1,587 stacks, Group B made 2,113 stacks.

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| 1. Mr. Marks now wants to know if changing the type of stapler will affect the number of stacks made. They all usually use the Xacto brand stapler, but he wants to try out PaperPro. Design an experiment for him to test out whether or not the type of stapler affects the number of stacks made. |

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Science Experiment** *Ice Melting*

**Directions**: How long does it take ice to melt? Maybe it depends if it is in **water**, in the **shade**, or on a **certain surface**. Design an experiment, and test how long it takes three ice cubes to melt in different conditions. Be sure to use the same size ice cubes.

**Materials Needed:** 3 same sized ice cubes, a timer or stopwatch, a calculator

**I. Purpose** – This is a general overview of the experiment while saving the details and results for later.

What’s the question we want to answer? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Who might be interested in our results? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**II. Hypothesis** – This is an educated guess or prediction of what you think will happen in the experiment. Which condition (ice placed in water, ice placed in the shade, or ice placed on a surface) will take the longest to melt? Be sure to use the word “*because”*.(**2 sentences**)

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**III. Procedure** – This is the longest section. Explain how you will do the experiment step-by-step. You will conduct three trials. What will you keep the same in each trial? What will you change in each trial?(**6 sentences**) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**IV. Observation** – The observation shows how an experiment was measured, like a graph or chart. It involves at least one of the five senses: sight, sound, touch, taste, or smell. You will need to record the experiment with a timer.

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| **Trial 1: Ice placed in water**  Number of minutes the ice took to melt: | Total Minutes for **All** Trials: |
| **Trial 2: Ice placed in the shade**  Number of minutes the ice took to melt: | Group Average (Total Minutes divided by 3): |
| **Trial 3: Ice placed on a surface**  Number of minutes the ice took to melt: | Something interesting that happened: |
| Do you think using spherical, square, or pyramid blocks of ice would make a difference? | |

**V. Conclusion** – The experiment is complete, and now it’s time to analyze the results. The conclusion is a mixture of words and numbers.

Discuss what happened. Explain what your results show. Be sure to use numbers in your explanation. (**3 sentences**) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Was your hypothesis correct? Explain. (**2 sentences**) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Make a final summary statement. (**2 sentences**) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_