DATE: NAME: CLASS:

GENERAL SCIENCE TOOLKIT

Experimental Design Worksheet

BLM G-33

Goal • Practise designing inquiries to test scientific relationships.

Introduction

In a controlled experiment, the independent variable is intentionally manipulated, and changes to other variables are observed.

For example, if a climatologist wants to use weather balloons for an inquiry, the scientist may first test a number of balloons to determine the most suitable size for the next experiment. This is referred to as a controlled experiment because there is one independent variable, the size of balloon.

What to Do

As the climatologist's assistant, you have been asked to design a controlled experiment to test change to the speed of different sizes of weather balloons.

- Use step 1 to 4 to help you plan this experiment.
- Use steps 1 to 7 to plan an experiment of your own.

Outline

1. Title your experiment.

_____

2. Do either part a. or part b.

(a) Develop a hypothesis using the following form.

As/If _____

_____

then _____

because _____

_____

(b) Predict what will happen using the following format.

As/If _____

then _____

_____

3. Identify the independent variable, and explain how it will be measured.

_____

_____

_____

4. Identify other variables (the dependent variables), and explain how each will be measured.

_____

_____

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5. Do either part a. or part b.

(a) Identify what observations to take, and how they will be taken.

_____

_____

_____

_____

(b) i. Identify what different treatments will be done. Provide an outline describing each treatment.

_____

_____

_____

ii. Describe what observations will be taken after each treatment, and how the observations will be recorded.

_____

_____

_____

6. After you have done your trials, list each of your key findings. Provide supporting details or data for each one.

Key Finding #1: _____

Supporting Details or Data: _____

_____

_____

Key Finding #2: _____

Supporting Details or Data: _____

_____

_____

Key Finding #3: _____

Supporting Details or Data: _____

_____

_____

Key Finding #4: _____

Supporting Details or Data: _____

_____

_____

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Key Finding #5: _____

Supporting Details or Data: _____

_____

_____

7. Consider whether or not the experiment should be repeated. Choose either part a. or part b.

(a) If you do not think that the experiment needs to be repeated, explain why not.

_____

_____

_____

(b) If you think that the experiment does need to be repeated, explain why you think it should be repeated, then explain what method you think should be used. If you make major changes to the method, explain why these changes are recommended.

_____

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