



ELEMENTS OF AN EXPERIMENTAL PROJECT

- **Background Research:** helps you understand your topic; helps you come up with a problem/testable question to investigate in your experiment.
- **Problem/Testable Question:** the specific question you will investigate in your experiment. For example: How can soil erosion be controlled?
- **Hypothesis:** what you think will happen in your experiment based on your background research. You will design your experiment to test your hypothesis. Write your hypothesis using the “If, then, because” format. For example: **If** grass and nasturtiums are planted in separate containers on the same slope angle, **then** the grass will prevent erosion better **because** grass shoots will grow more densely spaced and hold the soil in place.
- **Variables:**
 - ✓ Controlled variable: a quantity, value or state that is held constant throughout the experiment; what you keep the same in experiment; e.g., time for growth, temperature, amount of water for plants, etc.
 - ✓ Manipulated variable: ONE quantity, value or state that is purposely changed in the experiment; what is changed in order to see what happens in the experiment; e.g. type of plant planted in the container
 - ✓ Responding variable: a quantity, value or state that changes when a variable is manipulated; what happens as the result of changing something; e.g., the amount of soil eroded in the containers of grass and nasturtiums.
- **Materials:** a list of all materials used in the experiment, e.g. nine plant trays, nasturtium seeds, etc.
- **Procedure:** a step-by-step explanation of how you did your experiment, including the number of trials and sample size in each trial. You should do at least three trials (whole procedure conducted three times) to show the “reproducibility” of results. A good sample size would be, for example, three containers of grass and three containers of nasturtiums per trial.
- **Results/Observations:** collect your data and record it in a logbook. Then summarize the data in a table or a graph with the axes labelled correctly, and the units of measurement indicated.
- **Conclusion:** the final outcome of your investigation as confirmed by your data/observations; your conclusion should prove or disprove your original question/hypothesis.
- **Application/Extension:** explain why people would be interested in knowing your results and how they can use your results. Also explain how you would do your experiment differently in future or how you could do it better another time.