

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

## Speeding Up Germination



### Learner Outcomes:

- Describe life cycles of seed plants, and identify example methods used to ensure their germination, growth and reproduction (e.g., conduct a germination study)

### Key Terms:

germination  
embryo

cotyledon  
true leaves

seed coat  
seedling

**Background Information:** Many factors in the environment can affect the germination of seeds. Among these are soil temperature, air temperature, moisture content in the soil, and salt content in the soil. In this investigation, you will select and then manipulate one of these conditions to observe the impact on the rate of germination.

**Investigation Question:** What happens to the germination rate when one of these variables is changed?

### Materials:

50 mL grad cylinder  
Grow lights  
Ruler  
Thermometer

Bean seeds  
Paper / Styrofoam  
cups  
Paper towels

Water  
Other materials of the  
students' choice

### Procedure:

1. List the steps you will need to take to test your hypothesis. You will need to observe your experiment over several days.
2. List the materials you will use. Write out your specific procedure.
3. Design a data table to record your results.
4. Sketch and label the parts of your germinated seed.

### Hypothesis:

This investigation / activity has been adapted from:

Bullard J, Krupa G, Krupa M, et al. *Science Focus 7*. Toronto, ON: McGraw-Hill Ryerson.

**Experimental Design:**

Manipulated Variable:

Responding Variable:

Controlled Variables:

**Materials:**

**Describe your Procedure:**

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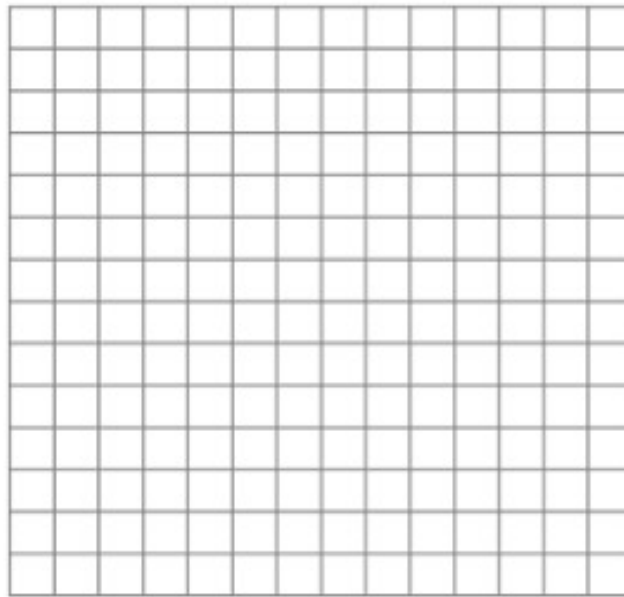
**Observations:**

**Analysis:**

1. Graph your results using a bar graph, placing the growth on the y-axis and the environmental variable on the x-axis.

**Title:** \_\_\_\_\_

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2. What happened to the germination of your seeds when you changed a variable?
3. What other factors might have affected the germination of your seeds other than those that were tested?

**Conclusion:** What influence did your manipulated variable have on the germination of your seeds?

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**Extension:**

In the Canadian prairies, farmers often plant species of "winter wheat" and "fall rye". Investigate what the advantages of these crops are over traditional varieties of wheat and rye and why farmers may choose to plant them.

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