

Name(s) \_\_\_\_\_ Period: \_\_\_\_\_ Date \_\_\_\_\_

## Step-by Step Experimental Design

**1. INDEPENDENT VARIABLE (S):** In the left column, list the independent variable(s) that you will change in your project. In the right column, list the levels that you will be testing. You must list at least 3 variable levels. See the example below.

<b>Independent Variable(s)</b>	<b>Variable levels</b>
<b>Example:</b> volume of water used on plants	0 mL/day, 5mL/day, 10 mL/day (3 levels)

**2. CONTROLS:** In the left column, list all the parts of the experiment that you will control, or keep the same in every trial. In the right column, describe how it will be the same. List at least five controls.

<b>Controls</b>	<b>Controls</b>
<b>Example:</b> 1. Type of pot 2. Type of water 3. Temperature of water 4. Diameter of pot 5. Type of soil	1. Terra cotta pot 2. Bottled Evian water 3. 20 degrees Celsius 4. 10 cm diameter 5. Home depot potting soil

**3. DEPENDENT VARIABLE:** In the left column, list the dependent variable that you will measure as the results of your experiment. In the right column, explain how you will measure it, what tools you will use, and what unit you will use.

<b>Dependent Variable</b>	<b>Method, tools, and unit</b>
<b>Example:</b> The height of the plant	<ul style="list-style-type: none"> <li>• On day one, measure height of plant in cm, using a ruler. Measure from top of soil to top of unsupported plant. (“Beginning height”)</li> <li>• After 10 days of watering, measure plant height again using same method, unit, and tool. (“Ending height”)</li> <li>• Subtract Ending height – beginning height to calculate plant growth. (cm)</li> </ul>

**4. NUMBER OF TRIALS:** In the left column, list the number of times you will test each variable level (at least 3). In the right column, list the TOTAL number of trials for the entire experiment.

(Total # of trials = # of variable levels x # of trials per variable level)

<b># of trials per variable level</b>	<b>TOTAL # of trials</b>
<b>Example:</b> 5	5 trials/level x 3 levels = 15 total trials

## **5. NOTES ABOUT THE EXPERIENCE:**

What materials did you use?

What additional materials will you need to perform the actual experiment?

What worked really well or really easily?

What didn't work so well or didn't go very easily?

What changes did you (or will you) have to make to your procedure?

In the space below, write any other comments about your experience and how you can make it better when you perform the actual experiment.

**6. WHAT DOES THE EXPERIMENT LOOK LIKE?** In the space below, draw a picture you of measuring your dependent variable during the experiment. Include all necessary tools and label each tool. If you prefer, take a photo during “playtime” and paste it below. Label all materials.

**Parent Signature** \_\_\_\_\_