# **HOW TO DESIGN AN EXPERIMENT (CRITERION B)**

#### **STEP 1: CHOOSE YOUR TEST**

Before you can design an experiment, you need to identify what you want to test (what question you want to answer)

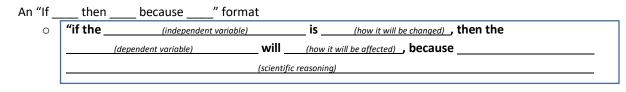
### **STEP 2: IDENTIFY YOUR VARIABLES**

This section is all about identifying the variables you'll be working with in your experiment. It should include:

- <u>Independent</u>: What factor you're changing/altering in each trial (and how it will be altered)
- Dependent: What you think will be affected (and how you're going to measure it)
- <u>Controlled:</u> What things will stay the same in each trial to ensure they don't affect the rsults

#### **STEP 3: WRITE YOUR HYPOTHESIS**

This section is all about making a prediction about what will happen to the dependent variable as you change the independent variable. A hypothesis includes:



Example: If the <u>temperature of the oil</u> is <u>increased</u>, then <u>the flow rate of the oil</u> will <u>get faster</u>, because <u>as heat</u> <u>energy is added to the oil the particles move faster and spread apart so they can flow more easily</u>

#### STEP 4: DESIGN YOUR METHOD

This section is all about making a set of instructions that tells others how to repeat your experiment exactly. It should include:

- Numbered List of Steps: logically and concisely describe how to complete your exact experiment.
- Quantities and Amounts (e.x. add 20mL of water into the 250mL beaker)
- Instructions for when/where to make/record observations.
- Clearly labeled <u>diagram(s)</u> or image(s) of any equipment set-up you will use.
- <u>Safety</u> Precautions: Any important safety information/warnings.

#### STEP 5: LIST THE MATERIALS YOU'LL NEED

This section is all about describing the equipment and substances you need in order to complete the experiment. It should include:

- A point form list of all equipment and/or substances required to complete the experiment
- Sizes & quantities (e.x. 2 x 10mL graduated cylinders)

#### **STEP 6: CREATE A DATA TABLE**

This section is all about making a space to record your results when you're actually doing the experiment. It should include:

- A title that is descriptive & underlined
- Column and row headings with units (if applicable)

## STEP 7: SUMMARIZE YOUR PROBLEM/QUESTION

This section is usually the last thing we write in an experimental design. The problem/question is all about introducing your experiment to the reader and giving them information they would need to fully understand the science behind your lab.

- Background information/scientific concepts/research that will help the reader understand your experiment
- What question you'll answer by doing your experiment
- A bibliography table to cite any research sources