

Directions: Title a word processing document *Developing a Controlled Experiment*, then answer the following questions.

1. Define the term *hypothesis*.
2. Define the term *independent (manipulated) variable*.
3. Why is it important for an experiment to contain controls?
4. Define dependent (responding) variable.

5. Develop a controlled experiment testing the following hypothesis: **The water temperature of the environment has an effect on a fish's breathing rate.** (You will complete a-e to design the experiment.)
 - a). **Materials:** List all of the equipment needed to carry on this experiment. Remember to control as many variables as possible

 - b). **Procedure:** List the steps that you would follow to perform the controlled experiment. Be specific. Make sure anyone could follow your directions.

 - c). What is the **manipulated variable**? (Also called the independent variable)

 - d). What are the **control(s)** of the experiment?

 - e). What is the **dependent variable**, (Also called the responding variable (what outcome are you looking for to measure results))

6. Complete a-e for the following: **Problem** Do cars using Petrozip gasoline get better gas mileage than cars using another brand of gasoline known as Flashfuel?
 - a) What is a possible hypothesis for the problem stated above?
 - b). What is the manipulated (independent) variable?
 - c) List the materials needed in the experiment.
 - d) List the controls that will be used in the experiment.
 - e.) What would be the responding (dependent) variable?

7. Interpreting the Data

Observe the following data collected from the experiment described in question number 6:

Distance in miles	Petrozip gasoline used (in gallons)	Flashfuel gasoline used (in gallons)
25	0.5	0.8
45	2.0	2.2
55	2.5	2.3
100	4.5	4.7
150	6.0	6.5
200	8.5	8.6

- a) Is this a controlled experiment? If so, how do you know?
- b) Which gas company has a better gas mileage?
- c) Create a **line graph** showing the data from this experiment.