

Analyze an Experimental Design and Determine if the Experiment is a Fair Test

Name _____

Date _____

Class _____

(Unit 1 Chapter 1, Activity 4)

Analyze the Experimental Design

The *manipulated variable* in an experiment is the variable that is being changed deliberately. The *responding variable* is the one that responds to the change.

The question that the experiment is designed to answer is often written in a relationship format similar to one of the following:

If the (*manipulated variable*) changes, then what happens to the (*responding variable*)?

or

What is the relationship between the (*manipulated variable*) and the (*responding variable*)?

Read the description of the experiment and ask yourself the following questions. They will help you to see what else, apart from the manipulated variable, may be affecting the experiment result.

1. What is the question the experiment is designed to answer? If it's not already written down in a relationship format, try to write it so that it is. (The question is often provided to you in the experiment description, so you just need to copy it. If it is not provided, you need to determine it from the description of the experiment.)
2. What is the *manipulated variable*? What is the *responding variable*? To find out, look at the experiment question, or read the description of the experiment.
3. What are the values (including units) of the manipulated variable?
4. What method is used to measure the responding variable?
5. What variables or conditions are kept the same (*controlled*) during the experiment?

Determine if the Experiment Is a Fair Test

Is there any variable (besides the manipulated and responding variables) that *changes* in the experiment?

If the answer is “no,” then the experiment is a fair test.

If the answer is “yes,” then the experiment is not a fair test.

Write the reasons why the experiment is, or is not, a fair test. For example:

“The experiment is a fair test because the only variables that changed were the manipulated variable (*write what it is*) and the responding variable (*write what it is*).”

“The experiment is not a fair test, because as well as the manipulated variable (*write what it is*), another variable (*write what it is*) was also changed. So the responding variable (*write what it is*) may be responding to more than one change.”