An Example of Fair Testing

An experiment that has all variables controlled except the one being tested is called a CONTROLLED EXPERIMENT or a FAIR TEST. This ensures that the results of the experiment are due to the one variable being investigated and not due to other variables.

Directions: Read the following description of an experiment and then answer the questions that follow.

A scientist wants to investigate whether plants need sunlight to grow. The hypothesis being tested is: “Plants require sunlight to grow.” The scientist placed one tray of sunflower seedlings in the sun and another tray of sunflower seedlings in a cupboard in the laboratory. The seedlings were watered and after 6 weeks the height of each seedling was measured.

1. Which variable/factor is being investigated (and therefore changed)?

2. Which variables/factors are being controlled? (There are a number of them.)
   a. __________________________
   b. __________________________
   c. __________________________
   d. __________________________
   e. __________________________
   f. __________________________

3. Explain how you would keep two of the variables controlled (the same) during the 6 week experiment.
   Variable 1: __________________________
   __________________________
   __________________________
   __________________________

   Variable 2: __________________________
   __________________________
   __________________________
   __________________________

4. Another term for controlling the variables in an experiment is “fair __________________________”.
Identifying Variables in an Experiment

The factor or variable being investigated (or tested) is called the **INDEPENDENT** variable. The factor or variable being measured is called the **DEPENDENT** variable (because it is dependent on the experiment).

**Directions:** For each of the following hypotheses, identify the independent variable, the dependent variable, and two variables that would need to be controlled (constants) in order to perform a fair test (controlled experiment).

1. **Fertilizer in soil increases flower production.**
   - Independent Variable: ________________________________
   - Dependent Variable: ________________________________
   - Two Controlled Variables: ____________________________

2. **Medicine A will reduce the incidence of headaches.**
   - Independent Variable: ________________________________
   - Dependent Variable: ________________________________
   - Two Controlled Variables: ____________________________

3. **If zinc tablets are taken, then the number of colds per year is reduced.**
   - Independent Variable: ________________________________
   - Dependent Variable: ________________________________
   - Two Controlled Variables: ____________________________

4. **If water is present, then the number of bacteria in garbage bins increases.**
   - Independent Variable: ________________________________
   - Dependent Variable: ________________________________
   - Two Controlled Variables: ____________________________

5. **Girls throw softballs further than boys.**
   - Independent Variable: ________________________________
   - Dependent Variable: ________________________________
   - Two Controlled Variables: ____________________________