

DESIGNING EXPERIMENTS

Writing Procedures

Writing detailed experimental procedures is very important in science. Scientists must be able to reproduce the results reported by other scientists in order for research to be taken seriously. When you write a procedure you must include specific information about the methods that you use, such as amounts, sizes, types of materials, temperatures, and data collection techniques.

Use the following guidelines when you write a procedure.

- Be sure to break your procedure into short, easy-to-follow steps.
- Start each step with a verb, or action word.
- Write your procedure so it is clear enough for someone else to use as instructions for repeating your experiment.

Suppose you want to determine the distance that a model car travels after it is allowed to move down a ramp. The procedure for this experiment could be written in the following form.

- Use a balance to find the mass of the model car.
 - Construct a ramp from cardboard that is 1 m in length and 15 cm in width.
 - Prop up one end of the ramp so that the top edge of the cardboard is at a height of 40 cm above the floor.
 - Mark the position of the bottom of ramp on the floor with a strip of tape.
 - Hold the car at the top of the ramp and mark the position of the front wheels on the cardboard.
 - Release the car.
 - Allow the car to stop moving, then measure and record the distance between the end of the ramp and the front wheels of the car.
 - Repeat the experiment two more times and calculate the mean distance for the three experimental trials.
1. Suppose you want to investigate the relationship between temperature and the rate at which bread mold grows. Write your hypothesis, the independent variable, the dependent variable, and the constants in the experiment. Then write a detailed procedure that could be used for this experiment.

Hypothesis: _____

Independent variable: _____

Dependent variable: _____

Constants: _____

Name _____

Period _____

Date _____

Experimental procedure: _____

Challenge Find four errors in the following step of an experimental procedure.

- With the beaker in one hand and the faucet handle in another, turn on the faucet and fill up the beaker. Pour it into a graduated cylinder and mix in 50 mL of isopropyl alcohol.

Rewrite the above step, taking into account the errors that you identified. Be sure to break the step down into as many steps as necessary. You may need to use a separate sheet of paper.
