

# Science Experimental Design Practice

**REMEMBER:** Think of science as a VERB (you have to do it!)

*10 Questions you can turn into simple, low-cost experiments to teach experimental design:*

1. Does adding aspirin to water keep flowers fresh longer?
2. How does the height from which a ping-pong ball is dropped affect the bounce height?
3. Which type of cup is a better insulator (Styrofoam, insulated cup, plastic, etc.)? Compare temperatures of hot water over time.
4. How does activity (lying, sitting, walking, running) affect pulse rate?
5. Which color of M&M's will people choose from a bowl? (This requires you to have an even number of each color of M&M in the bowl and not to tell the test subjects what you're testing.)
6. Compare how moldy a slice of bread will get over time with different preparations (in a plastic bag, left out, in a paper bag, etc.).
7. Compare how long it will take water to evaporate out of different shaped containers.
8. Roll a marble or a car down a ramp. How does the height of the ramp affect how far it goes? (This can also be set up to test how the rolling surface affects distance rolled if height remains the same and rolling surface is changed.)
9. How does the temperature of water affect how quickly it will dissolve an Alka Seltzer?
10. Does the size of a coin affect how long you can spin it on its edge before it falls? (Compare dime, penny, nickel, quarter, dollar coin).

For each of these, identify:

- A. Hypothesis
- B. Many controlled variables
- C. 1 Experimental (changed) variable
- D. How you will collect data
- E. How data will be evaluated

Source: Jeff Goodman, Appalachian State University

## Designing an Experiment

Name \_\_\_\_\_

### HYPOTHESIS

The hypothesis the person is testing is that

\_\_\_\_\_

### CONTROLLED EXPERIMENT

The variable that I change (*Independent variable*) is

\_\_\_\_\_

The variable that is measured and results in Data (*Dependent variable*) is

\_\_\_\_\_

The variables that are controlled for, that is, are held constant are \_\_\_\_\_

\_\_\_\_\_

The *experimental group* includes \_\_\_\_\_

\_\_\_\_\_

The *control group* is used for comparison and has \_\_\_\_\_

\_\_\_\_\_

### DATA

Data will be collected by \_\_\_\_\_

\_\_\_\_\_

### CONCLUSION

Based on the data collected, the hypothesis was/was not supported (circle one) and the

following conclusion can be made: \_\_\_\_\_

\_\_\_\_\_

## Inquiry Method Recording Sheet

| Step 1 – Observations, Questions, and Hypotheses |           |
|--|-----------|
| Observations                                     | Questions |
| Hypothesis                                       |           |
| Step 2 – Scientific Testing                      |           |
| Investigation & Data                             |           |
| Step 3 – Analysis and Conclusion                 |           |
| Discuss data & draw conclusion                   |           |
| Step 4 - Communication                           |           |
| We communicated our results by                   |           |

# The Scientific Method

Question or Problem

Graphic Organizer  
for Science  
Experiments

Hypothesis

Experiment

Results

(Your Prediction)

(What did you do?)

(What Happened?)

(IV, What did you change?)

(DV, What data did you collect?)

(Constant, What is kept the same?)

Conclusion

(Hypothesis supported or not? What did you learn? What about next time?)