Name _____

Step 3: Form a Hypothesis (Part 2)

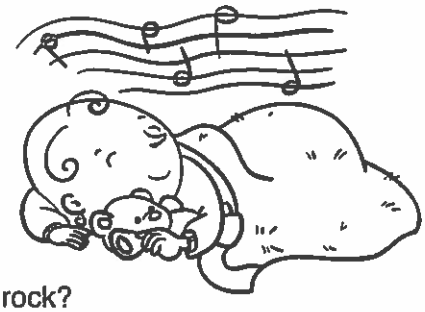
A hypothesis does not just predict what will happen in an experiment, but it specifically tells how one variable (IV) might affect another variable (DV). A hypothesis can be written in a specific way to express this relationship between the independent and dependent variables. (Remember that a hypothesis is a guess about the results; it does not have to be correct.)

A hypothesis can be written as an "If…then…" statement. When the variables are added into the hypothesis, the format becomes "If IV, then DV." Think of it like this: "If I change the IV, then I think the result (DV) will be _____." *Don't forget that the hypothesis is your prediction about what will happen, so you will have to add your own words and thoughts into this format!*

Example:
Research Question: Does salt water freeze faster than fresh water?
IV: Type of water DV: Time water takes to freeze

Possible Hypothesis: If I test salt water and fresh water, then fresh water will freeze faster.

A good way to make sure that your hypothesis is written correctly is to circle the words "If" and "then" in the hypothesis and underline the IV and the DV.



Identify the independent and dependent variables in each experiment described below. Then write a hypothesis. Circle "if" and "then" in your hypothesis and underline the IV and DV.

1. Which type of music quiets a crying baby faster: jazz, classical, or rock?
   IV: _____ DV: _____
   Hypothesis: _____

2. Does the color of the recycling bins, red or blue, affect the number of cans recycled at school?
   IV: _____ DV: _____
   Hypothesis: _____

3. Does the temperature of water affect how quickly food coloring spreads through it?
   IV: _____ DV: _____
   Hypothesis: _____

4. Is the number of eggs a chicken lays affected by the hours of daylight?
   IV: _____ DV: _____
   Hypothesis: _____

5. Will a rubber band or string hold more weight without breaking?
   IV: _____ DV: _____
   Hypothesis: _____

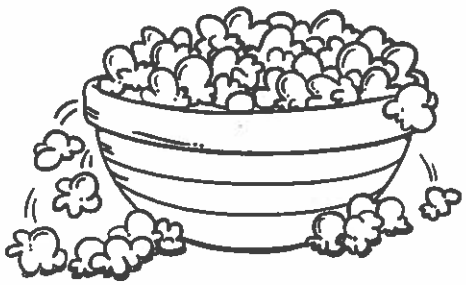
6. Which type of gum contains the most sugar: Brand A, Brand B, or Brand C?
   IV: _____ DV: _____
   Hypothesis: _____

Name _____

Step 4: Test the Hypothesis (Part 2)

It is important that the experiments you design are controlled, fair tests. Only one variable should be manipulated at a time, and everything else needs to be held constant.

Read the following experiment descriptions. Each experimenter has made at least one mistake. Tell what the experimenter did wrong AND suggest how the experiment could be improved.



1. Tara wanted to find out which brand of popcorn results in the fewest unpopped kernels. She purchased 3 of the same size bag of different brands of microwave popcorn. Tara popped Brand A for 3 minutes and 30 seconds, Brand B for 3 minutes and 45 seconds, and Brand C for 4 minutes. She poured each bag into a separate bowl and counted how many unpopped kernels remained.

   What did Tara do wrong? _____

   How could she improve her experiment? _____

   _____

2. Jeremiah is testing which paper towel is most absorbent. He takes 4 different brands of paper towels and cuts them to the same size. He holds each paper towel under running water and observes the results.

   What did Jeremiah do wrong? _____

   How could he improve his experiment? _____

   _____

3. Tina and Jazmine want to know which flavor of hard candy lasts the longest. They choose 4 flavors of candy. Tina puts 2 in her mouth and, at the same time, Jazmine puts 2 in her mouth. They time to see which candy lasts longest.

   What did Tina and Jazmine do wrong? _____

   How could their experiment be improved? _____

   _____

4. Demetrius wants to find out if the size of a ball will affect how high it bounces. He chooses a ping-pong ball, a softball, and a bowling ball. He drops each from a height of 2 meters. His friend holds a meter stick and records the bounce of each ball.

   What did Demetrius do wrong? _____

   How could he improve his experiment? _____

   _____

5. Now that you can find the flaws with others' experiments, it's time to try writing your own procedures! Below are three research questions. There are many different ways to set up experiments for these questions. Choose one of the questions (circle your choice) and, on the back of this paper, write a set of experimental procedures to test the question. Make sure the steps are specific enough that someone could do your experiment without asking you any questions!

   Question A: Which battery lasts longer?
   Question B: Which paper towel is strongest when wet?
   Question C: Which laundry detergent removes grass stains best?