

HOW TO WRITE A GOOD HYPOTHESIS USING "IF... THEN... BECAUSE..."

An "If... then...because" statement in a hypothesis tells the readers what you believe will happen in an investigation when something is changed, so you can see the effect of the change.

- **IF...** tells the readers what will be changed. This is the *manipulated* (independent) *variable* in the investigation.
- **THEN...** tells the reader what will happen because of the change (manipulated variable) described in the If... statement. This is the *responding* (dependent) *variable* in the investigation.
- **BECAUSE...** tells the reader how you know this will occur. It should be based on something you have experienced, or perhaps something you infer.

Examples:

- If 7th graders and 8th graders complete the same math problems, then the 8th graders will have more answers correct, because they have studied math for one year longer than the 7th graders.
- If dry bread and moist bread are left in bags for two weeks, then the moist bread will grow mold more quickly than the dry bread, because mold is a living organism, and organisms need water to survive.
- If some students eat breakfast before school and others do not, then the ones who do eat breakfast will have better grades in their morning classes, because their brains have more energy to think.

Now, let's try this together. To warm up, identify the three types of variables below. Then use the variables to make a good hypothesis.

1. Melissa raises crickets at her pet store that she sells for reptile food. She thinks that crickets chirp more often when the temperature gets warmer. She decides to conduct an experiment to prove her theory.
 - a. Manipulated variable _____
 - b. Responding variable _____
 - c. Controlled variable _____
 - d. Controlled variable _____

Hypothesis: If _____ (manipulated variable)
then _____ (responding variable),
because _____

2. The cooler the temperature in a lake, the more oxygen the water holds. Daniel notices that he catches more fish in a lake that is cooler than 55 degrees. He wants to conduct a study so he can catch the most fish possible this year. He's having trouble writing a hypothesis. Please help him.

Hypothesis: If _____ (manipulated variable)
then _____ (responding variable),
because _____.

3. Kasey lives in Moab, Utah. She likes to mountain bike for miles and miles until she can't bike anymore. She thinks that she can bike further when she drinks more than a liter of water before her bike ride. Please assist her in developing a hypothesis, so she can make the best of her future bike rides.

Hypothesis: If _____ (manipulated variable)
then _____ (responding variable),
because _____.

4. Jimmy likes to work with his friend Joe on 7th grade science class labs. However, he notices that he tends to get lower grades when he does work with Joe, because he and Joe like to talk about basketball and not science. He's decided to investigate if his science lab grades are higher when he works with Joe or if they're higher when he works with someone else. He has set goals to become a better student, so could you please help him write a hypothesis for his study?

Hypothesis: If _____ (manipulated variable)
then _____ (responding variable),
because _____.

5. Mr. Montanari has noticed that there is a wide range of grades that students get on tests, even though they are all in the same class. He wonders whether students, who study for 20 minutes per night, every night, get higher scores on tests or not. Mr. Montanari wants as many kids to be successful as possible. Please help him write a hypothesis about this problem.

Hypothesis: If _____ (manipulated variable)
then _____ (responding variable),
because _____.