

SCIENCE PROCESS SKILLS**● Forming a Hypothesis**

If you want to use the scientific method to deal with a problem, you must learn how to form a hypothesis. A hypothesis is an educated guess that can be tested. It attempts to account for the data at hand.

How Do You Form a Hypothesis?

The first step is to collect as many observations as possible about the problem you are trying to examine. Then consider your observations and think about how they might relate to the problem. Try to imagine possible solutions to explain your observations.

Once you come up with a possible explanation, ask yourself if it could be proven wrong by an experiment. If it could be proven wrong, then you have formed a hypothesis. If there is no way to prove it wrong, go back to your data and try to come up with another hypothesis.

Read the paragraphs below. Then, as you read each numbered section, follow the instructions on the right to form a hypothesis.

Every day for the past week you have come home from school to find that your favorite plant has been knocked onto the floor from its place on the windowsill. The plant is an aloe plant. In the past year, it has grown to almost twice its previous size. You always leave the aloe plant sitting securely on the windowsill with the window open.

The last time you were cleaning up the plant, you noticed paw prints in the dirt that had spilled from the pot. You have only one pet, a cat. You look around to see what other observations you can gather. Outside the window, you see the stump of the tree that your neighbor cut down about a week ago. Before he cut it, the tree grew directly in front of your window.

Looking for more clues, you ask your cousin if she has seen anything. She is in town for a visit and has been staying in the guest room downstairs for the past week. She always plays really loud music with a lot of bass. When you ask her, she assures you that she hasn't noticed anything unusual.

1. Collecting Observations

In the description of the problem above, several observations have been made. Read this description again, and think about which statements are observations.

Make a list of all of the observations given in the description above.

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2. Evaluating the Observations

Examine the list you made in step 1. Think about which observations might offer clues to the cause of the problem. These observations will help you form a hypothesis.

Make a list of all the observations from step 1 that might help you explain the cause of the problem.

3. Imagining Possible Explanations

Using the list you made in step 2, imagine as many explanations as you can of what is causing the flowerpot to be knocked off the windowsill. Remember that an explanation cannot contradict any of the observations you listed in steps 1 and 2.

Make a list of any explanations that you can imagine. Be sure that your explanations don't contradict any of the observations.

4. Judging Which Explanations are Hypotheses

Examine the possible solutions you listed in step 3. Try to think of experiments that might prove the solutions to be incorrect. For example, if one of your possible explanations was that your plant was knocked over by the wind, then you could perform the simple experiment of leaving the window closed for a day. Since this explanation could be disproven by an experiment, it is a valid hypothesis.

Determine which of the solutions from step 3 could be disproven by an experiment. These are your hypotheses. You should have at least three hypotheses. To complete the scientific method, you would test each hypothesis to see which one, if any, is correct.