



Writing a Testable Question

Objective(s):

Participants will be able to:

- Identify the characteristics of a good testable question.
- Develop a testable question that will lead to a scientific investigation.

What is a Testable Question

1. A testable question Can be answered through **experimental inquiry and observation of the natural world.**
2. Involve **variables that can be manipulated and measured.**
3. Allow for **hands-on experimentation and or data collection.**
4. Meet the criteria of being **provable true or false and reproducible.**

How do you write a testable question

A testable question usually follows the same format.:

- How does the _____ affect _____?
- What is the affect of _____ on _____?

Using this format allows for the scientist to clearly identify measurable variables and develop an experiment.



What are variables?

Types of Variables

There are 3 types of variables in a scientific investigation:

- 1. Independent variables:** These are the factors intentionally changed or manipulated during the experiment.
- 2. Dependent variables:** These are the variables being tested or measured during the experiment.
- 3. Control variables:** These need to remain constant during the experiment.

Let's Take a Look





Writing a Testable Question

Step 1: Identify your area of interest and ask a question.

Examples:

- Shoes- Which shoe is best for running
- Sports-Which bat is best for hitting home runs?
- Botany- What makes flowers grow?

Step 2- Look for a cause-and-affect relationship.

Examples:

Shoes- Which shoe is best for running

- The brand of shoe impacting the running speed
- The type of shoe impacting the running speed

Sports-Which bat is best for hitting home runs?

- The size of the bat impacting the hitting
- The type of material impacting hitting

Botany- What makes flowers grow?

- The type of fertilizer impact on growth speed
- The type of light impact growth speed

Step 3: Input your cause and affect into the question stem.

How does the _____ affect _____?

What is the affect of _____ on _____?

Cause and Effect Statement

- The brand of shoe impacting the running speed
- The type of shoe impacting the running speed
- The size of the bat impacting the hitting
- The type of material impacting hitting
- The type of fertilizer impact on growth speed
- The type of light impact growth speed

Testable Question

- How does the brand of shoe affect how fast you run?
- What is the affect of brand type on running speed?
- How does the size of the bat affect hitting?
- How does the type of material affect hitting?
- What is the affect of types of fertilizer on growth speed?
- How does the types of light affect the growth speed?

Let's look at it



Let's Try it- Let's write each question as a testable question

Read the non-testable question below, select the best testable question to match.

- **Non-Testable Question**

- Is the achievement in school higher when students are tested frequently?

- a. How does testing frequency affect student achievement?

- b. Why do students test frequently?

- c. Will testing student more frequently increase achievement?

Let's Try it- Let's write each question as a testable question

Read the non-testable question below, select the best testable question to match.

Non-Testable Question

- Does carbon dioxide in the atmosphere cause the atmosphere to warm?
- a. How does using heat lamps warm up a room?
- b. How does carbon dioxide in the atmosphere affect how much the atmosphere warms?
- c. Why is there carbon dioxide on the atmosphere?

Let's Try it- Let's write each question as a testable question

Read the non-testable question below, rewrite it as testable question.

- **Non-Testable Question**
 - How do plants grow?

Rewrite your testable question below:

Let's Try it- Let's write each question as a testable question

Read the non-testable question below, rewrite it as testable question.

- **Non-Testable Question**
 - How long do batteries last in toys?

Rewrite your testable question below:



Thank you!

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