

For Students

# THE FOUR-QUESTION STRATEGY

The Four-Question Strategy is a technique that teachers can use with students to help them generate original experiments and narrow down their research topics. This strategy enables students to explore the possible variations of a research topic before they attempt to state a problem, a hypothesis, identify variables, constants, and the control.

Begin by modeling in class the sequence of four questions for generating experimental ideas from a general topic....for instance, “plants”.

**1. What materials are readily available for conducting experiments on (plants)?**

Response: Soils  
Plants  
Fertilizers  
Water  
Light / Heat  
Containers



**2. How do (plants) act?**

Response: Plants grow.

**3. How can I change the set of (plants) to affect the action?**

Response:	<u>Water</u>	<u>Plants</u>	<u>Containers</u>
	Amount	Kind	Location of holes
	Scheduling	Spacing	Number of holes
	Method of application	Age	Shape
	Source	Size	Material
	Composition		Size
	pH		Color

**4. How can I measure or describe the response of (plants) to the change?**

Response:	Count the number of leaves	Count the number of flowers
	Measure the length of the longest stem	Measure the diameter of the stems
	Mass (weigh) the fruit produced	Determine the rate of growth

Students can learn to write a hypothesis by relating a response to Question 3 with a response to Question 4 by using the following format: IF I change (an independent variable from Question 3), THEN the (dependent variable from Question 4) will change.

Have students design an experiment by selecting one independent variable and one dependent variable. All other potential independent variables become constants for the experiment.

### Practicing the Four-Question Strategy

Practice the Four-Question Strategy using one of the following prompts:

- Goldfish
- Acid rain
- Wood stain
- Baseballs
- Seeds
- Television
- Plastic wrap

What materials are readily available?	How does (_____) respond or act?	How can I change the materials to affect the action?	How can I measure the response to the action?