Warm-Up | Designing Scientific Investigations

Lesson Objectives

By the end of this lesson, you should be able to:

- Demonstrate how scientific _____ are turned into _____.

Science Practice: Design and conduct a laboratory _____ to answer a specific _____.

Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

	a variable that causes a change to another variable
	the part of an experiment that does not change and is used as a baseline comparison
	a variable that is changed by another variable

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Lesson Question

Slide 2

Dependent Variable

The _____ is the variable that is _____ and _____ during the experiment; it is “dependent” on the independent variable.

- Question: I wonder how more salt would affect _____?
- Hypothesis: I think more salt would _____ plant growth.
- The _____ variable is _____. How plant growth responds during the investigation *depends* on what is done with the salt.

4

Independent Variable

The independent variable is the variable that is _____ or manipulated on purpose by the _____.

- Question: I wonder how more _____ would affect plant growth?
- Hypothesis: I think _____ salt would slow down plant growth.
- The _____ variable is _____. In this investigation, the salt is the independent variable because it is the one that is changed by the researcher.

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Slide 6

A Memory Trick for Variables

STRATEGY

If you format your hypothesis in the form of: If x . . . then y:

- x is the _____ variable
- y is the _____ variable

Slide 8

Controlled Variables

REAL-WORLD CONNECTION

A _____ is part of an experiment that _____ change; it is used to _____ the results during experimentation as the independent variable changes.

In the hummingbird investigation, the controls are:

- feeder _____ and _____.
- food.
- feeder _____.
- _____ conditions.
- _____ of day.

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Slide 10

Repeating Tests

Repeating tests:

- guards against _____ or “flukes.”
- increases _____ in the results.
- is _____ from having _____ sizes. Repeating a test means starting the process over with a new large sample group of the same kind of test subject.

Experimental Groups and Control Groups

Large experiments with _____ test _____ are often split into _____.

- The _____ group gets the treatment being tested.
- The _____ group does not get treated.
- Each group is exposed to exactly the same conditions except for the _____.
- The _____ of the experimental group are _____ to the control group to determine the effectiveness of the treatment.

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Lesson Question

How are scientific questions tested?

Answer

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Review: Variables in Experiments

- The [ ] variable is what is [ ], observed, and evaluated during the experiment.
- The [ ] variable is the variable that is [ ]. It is the only variable changed. The researcher sees how changes in the independent variable affect the dependent variable.
- All other variables that could affect the outcome of the investigation are [ ] or kept the [ ].

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Review: Experimental Procedures

- _____ tests leads to more confidence in the results.
- Experiments with _____ test _____ are often split into _____ groups.
- The _____ group receives the _____ ; the _____ group _____ .

Use this space to write any questions or thoughts about this lesson.

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