

Prediction, Inference, and Hypothesis

In each of the following, make a prediction or inference. Then modify these statements to create a testable hypothesis.

1. The strength of any wire appears to depend upon temperature. You observe that at room temperature, a single strand of 100 kg test wire will easily support 100 kg. What will happen when that wire is tested in a hot oven?

Prediction: _____

Hypothesis: _____

2. You observe that when goldfish are reared individually, they grow to be a larger size than when reared in a group.

Inference: _____

Hypothesis: _____

3. You observe that when a small amount of baking soda is added to a glass of water, gas bubbles form in the mixture and move to the surface. Predict what will occur when you add a large amount of baking soda to a glass of water.

Prediction: _____

Hypothesis: _____

4. A survey reveals that people who live within a 5 km radius of a chemical plant have a higher incidence of lung disease than people who live outside that area.

Inference: _____

Hypothesis: _____

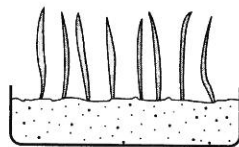
Examining an Experiment

Have you ever noticed how a plant bends toward the light? Plants twist and bend in order to get toward the light. The attraction of plants toward light is referred to as phototropism.

In this example, Lee and Jill conducted experiments to learn more about the way corn plants grow. You will observe their experiments and interpret the data they collected.

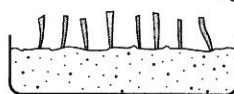
Experiment #1

Group A

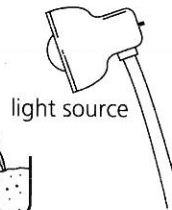


Normal plants with tips on the shoots.

Group B



Plants with tips cut from the shoots.



light source

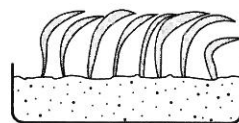
- (a) Identify the control and the experimental groups.

- (b) What are the independent and dependent variables?

After a period of time, Lee and Jill observed the following.

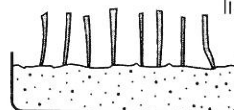
Experiment #1

Group A

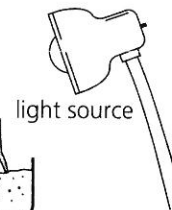


Normal plants with tips on the shoots.

Group B



Plants with tips cut from the shoots.



light source

- (c) Record your observations.

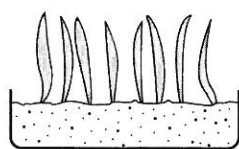
Lee and Jill examined the results. Lee concluded that the cutting of a plant prevented it from responding to the light. He suggested that the injured plant must be using all of its energy to repair itself. Lee explained, "That is why the plants in group B failed to grow and to bend toward the light."

Examining an Experiment (continued)

Jill suggested that they do another experiment to test Lee's hypothesis. In the second experiment, Jill and Lee decided to cover the tips of the shoots with aluminum foil.

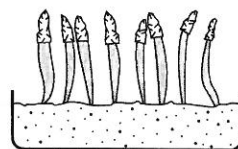
Experiment #2

Group A

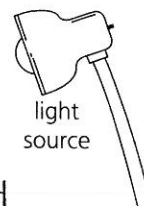


Normal plants with tips on the stems.

Group B



Plants with foil on the tips of the stems.



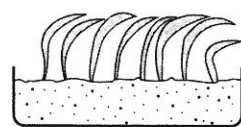
light source

(d) What were Lee and Jill testing in the second experiment?

The following observations were made a few days later.

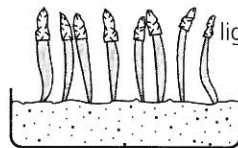
Experiment #2

Group A



Normal plants with tips on the stems.

Group B



Plants with foil on the tips of the stems.



light source

(e) Record your observations.

(f) On the basis of the second experiment, Lee decided to change his first hypothesis. Why did he believe that his first hypothesis was no longer correct?

(g) What conclusion would you make, based on the results of the second experiment?
