# Funky Food

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Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.

Start learning right now about how to find out which activity most likely caused an outbreak of an infection. Take the following brief quiz to see how much you already know about epidemiology. See the bottom of page 4 to check your answers.

1. All of the following are hypotheses *except*:
   a. a heavy ball will travel a greater distance than a lighter ball.
   b. airplanes travel a long distance.
   c. a large magnet will pick up more paperclips than a smaller magnet.
   d. yellow flowers require more water than red flowers.

2. The term "epidemiology" literally means:
   a. what is above the ground.
   b. what is larger than most things.
   c. what is lower than the earth.
   d. what is upon the people.

3. Who is most often credited as being the first epidemiologist?
   a. John Snow
   b. Hippocrates
   c. Eratosthenes
   d. Plato

4. One of the major ideas that governs modern epidemiology is that, "Correlation does *not* imply causation."
   a. true
   b. false

5. The phrase "biological gradient" generally refers to the:
   a. impact due to the amount of a given exposure.
   b. factor that serves as a control.
   c. color of a flower or plant.
   d. amount of life left for a given organism.
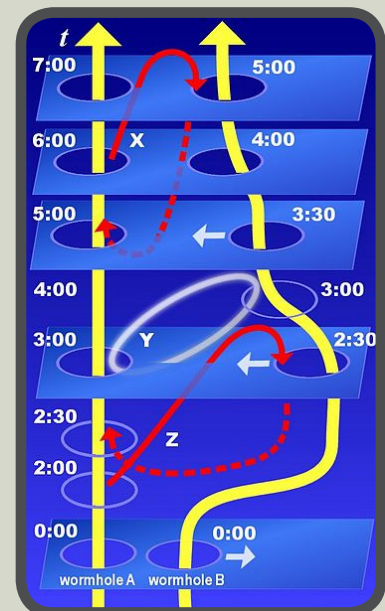
A Simple Study

Mary investigated the effect of different concentrations of chemical X on the growth of tomato plants. Mary reasoned that higher concentrations of chemical X added to the plants would lead to slowed plant growth. She grew four flats of tomato plants (10 plants per flat) for 15 days. She then applied chemical X as follows: Flat A - 0% chemical X; flat B - 10% chemical X; flat C - 20%; and flat D - 30%. All plants received the same amount of sunlight and water each day. At the end of 30-days Mary recorded the height of the plants in centimeters. Mary's data follow:

Data Table 1. **Change in height of plants (in centimeters)**

Flat A	Flat B	Flat C	Flat D
15	18	12	6
14	20	10	8
13	14	14	5
15	20	10	4
15	18	8	4
17	19	8	5
18	18	10	8
12	18	10	7
19	17	11	8
15	19	12	5

Questions

1. Identify the independent, dependent, and moderator variables.
   independent variable = _____
   dependent variable = _____
   moderator variable(s) = _____

2. Write the study hypothesis.
   _____
   _____

3. Which flat(s) is/are the control group? _____

4. Which flat(s) is/are the experimental group? _____

5. How is the dependent variable operationally defined?
   _____

6. What is the sample size? _____

7. Write a conclusion for Mary's study.
   _____
   _____

Proven to Grow Hair

How many times have you heard commercials make claims, such as *"proven to improve your looks"* or *"proven to reduce fat?"* Proof is not a word often used by true scientists. This is because scientists find it almost impossible to prove anything.

Imagine that you rolled a ball across the floor and the ball came to a stop. What law did you prove? Many would say that you proved that the natural state of an object is at rest. But is your statement truly correct? Did you really prove the law of motion? Absolutely not! The only way to prove anything would be to do the experiment an infinite number of times in all possible conditions. Is it possible to roll an infinite number of balls across a floor? Nope. So if scientists can't prove anything, what can they do?

Scientists are in the business of disproving things. All they have to do is show that the moving ball doesn't behave according to the expected results and they disproved their earlier hypothesis. In fact, when scientists changed the conditions and moved the ball to outer space, the ball travels forward forever without any additional input of force. So the natural state of an object is in motion, not at rest. They disproved the "at rest" notion. So the next time you hear an announcer say, *"proven to,"* remember that these terms are rarely used in a scientific sense.

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