

Create Your Own Scientific Experiment



Objective:

In this activity, you will be designing your own short experiment. You will be collecting quantitative data by measuring 25 items and comparing them to another 25 items. Using this data, you will do mathematical calculations of mean, median, and mode and use those calculations to draw conclusions.

QUESTION

1. Using background knowledge that you already have, **decide on a question/problem to solve**. Remember that during your experiment, you will need to measure 25 items and compare it to another 25 items.

Examples: Do trees by the road have stunted leaf growth due to pollution?

This experiment is testable by measuring 25 leaves from a tree by the road and 25 leaves from a tree of the same species further from the road.

Is a blueberry bush in the sun more productive than one in the shade?

This experiment is testable by measuring the number of blueberries on 25 branches of a bush in the sun and comparing with 25 branches of a bush in the shade.

Does the average height of individuals driving SUVs differ from those driving sedans?

This experiment is testable by measuring the height of 25 individuals that drive SUVs and comparing it with the height of 25 individuals that drive sedans.

Do the test grades of Biology students vary depending on topic?

This experiment is testable by finding the grades of 25 Biology students on one test and comparing it to the same 25 Biology students on a test of a different concept/topic. (Teachers providing these scores should keep the grades anonymous to protect student privacy.)

Do the number of raisins differ in brand name Raisin Bran™ compared to generic?

This experiment is testable by taking 25 random cup-sized scoops of cereal from a brand name box and counting the number of raisins per cup. Then, repeat with the generic cereal and compare.

*NOTE:

Deciding on the problem you want to solve a time-consuming part of this project. Give yourself appropriate time to brainstorm a few ideas and decide on the best one.

Question:

HYPOTHESIS

- Now that you have settled on a question, it's time to come up with a hypothesis. What do you predict will be the outcome of this experiment?



EXPERIMENT

- Plan your experiment.
 - Which of your measurement sets is likely the control group?
 - What are your variables? Which one is the independent variable (what is changing) and which one is the dependent variable (what you're measuring)?
- Run your experiment by taking your 50 measurements. If your experiment requires additional time, resources, or to be completed at home, you can finish it in the next few days.

DATA

- Record your data on the data sheet on the following page. Your first 25 measurements can be recorded in Table 1 and the second 25 measurements can be recorded in Table 2.
- After recording all of your data, calculate the mean, median, and mode of each table.

Mean= $\frac{\text{Sum of all numbers}}{\text{\# of measurements}}$

Median= The middle value when measurements are organized from least to greatest.

Mode= The most common measurement.



CONCLUSION



7. What conclusions can you draw from this data? Was your hypothesis supported or rejected?

8. Are there any possible sources of error that may have affected your results? If so, what are they?

PEER REVIEW

9. Share your data and conclusions with 2 other students. Do they agree with your conclusion?

Are there other sources of error that your peers found?

