

Acquisition Lesson Planning Form
Plan for the Concept, Topic, or Skill – Experimental vs. Observational Studies
Key Standards addressed in this Lesson: MM3D3
Time allotted for this Lesson:

Standard: MM3D3 Differences between experimental and observational studies by posing questions and collecting, analyzing, and interpreting data.

Essential Question:

What is the difference between an experimental and observational study?

Activating Strategies:

Give the students the following question.

A study follows two groups of students, who are randomly selected from a school, for one year. Students decide which group to join depending on which category they feel they belong to: I watch more than 10 hours of TV per week OR I watch fewer than 5 hours of TV per week. Students who watch no television, or who watch between 5 and 10 hours a week, were excluded from participating in the study. The study records the average grades and the percent of students who participate in team sports.

Question: Is this an observational study or an experiment? Explain

Acceleration/Previewing: (Key Vocabulary)

Observational study Experimental Study Control Group Experimental Group

Task:

And You Believed That?!

We're Watching You

Distributed Guided Practice/Teaching Strategy:

Give the students the following checklist to help them determine if problems are observational or experimental. Use the activating problem and go through the checklist.

- 1) Check to see if the two groups were randomly selected. **Yes, the students were randomly selected.**
- 2) Check to see if every member of the population has an equal chance of being included. **No, students who watch no television, or who watch between 5 and 10 hours a week, were excluded.**
- 3) Check to see if the researches impose controls. **No. The students decide for themselves which group they are in. They are not told how much television to watch.**

Conclusion: **This is an observational study, not an experiment.**

Extending/Refining Strategies:

We're Watching You

Summarizing Strategies:

Journal: Compare and contrast observational and experimental studies.

Observational or Experimental Worksheet

Identify each of the following as observational or experimental.

1. Compare the grades on a final math test of 25 students who use calculators and 25 students who do not use calculators. The students decide which group they are in.
2. Compare voter satisfaction levels between people assigned to use either paper ballots or touch-screen machines.
3. Determine if people who take vitamin C every day are less likely to get colds.
4. Determine which brands of orange juice people prefer. The people are randomly chosen at the supermarket and are asked to taste both brands without knowing which brand they are drinking.

For each situation, choose the most appropriate technique for collecting data. Use the technique exactly once.

Census Sample Survey Observational Study Experiment

5. Estimate the number of students in your school who play video games more than 10 hours per week.
6. Decide if computer games are more effective than paper and pencil drills for children learning the multiplication tables.
7. Find out if not using car seat belts increases deaths and accidents.
8. Compare average class size for math classes and English classes in your high school.

Explain why each of these samples might be biased.

9. The first 10 customers of the day at a restaurant are asked if pizza should be added to the menu.
10. A random selection of women are called every morning for a week to determine if television shows are too violent.