

Study Method Match

Choose the right way to collect evidence.

HIGH SCHOOL • HSS-IC.B.3

CCSS.Math.Content.HSS-IC.B.3 "Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each."

NAME _____

DATE _____

CHOOSE THE METHOD

Use a sample survey to describe a population by asking a randomly selected sample. Use an experiment to test a treatment by randomly assigning participants to groups. An observational study records what people already do, so it does not assign treatments.

WORKED EXAMPLE

A researcher randomly assigns 48 volunteers to use either a blue-light filter or no filter for one week. The researcher then compares their sleep hours. Name the study type and explain the randomization.

1. The researcher assigns a treatment, the filter or no filter.
2. Assigning treatments makes this an experiment.
3. The random assignment helps make the two groups similar at the start.

Answer: Experiment. Participants were randomly assigned to treatment groups.

PRACTICE 4 problems

- 1** A school randomly selects 30 students and asks how many hours they sleep on school nights. Name the study type.

ANSWER _____

- 2** A coach flips a coin to assign athletes to two warm-up routines, then compares jump heights. Name the study type and the role of the coin flip.

ANSWER _____

- 3** Researchers record students' backpack weights and back-pain reports without changing anything. Name the study type.

ANSWER _____

- 4** A club asks the first 20 students who enter the cafeteria whether they like the new menu. Is this a random sample?

ANSWER _____

APPLY IT Show your work

1

The student council wants to estimate what fraction of all students support adding more charging stations. It uses a random number generator to select 75 student ID numbers and sends those students a question. What method is this, and why is random selection useful?

WORK SPACE

ANSWER _____

2

A gaming club wants to test whether a five-minute break improves score on a puzzle round. Members are randomly assigned to take a break or continue playing, then each member plays the same puzzle round. What method is this, and what conclusion can the club make if the break group has a higher average score?

WORK SPACE

ANSWER _____

CHALLENGE One step up

For each plan, name the study type. Then choose the plan that can best show whether drinking water during class causes higher quiz scores, and explain why. Plan A: Randomly select 100 students and ask how much water they usually drink and their latest quiz score. Plan B: Randomly assign 100 students to drink water during class or not drink water during class, then give the same quiz.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A school randomly selects 30 students and asks how many hours they sleep on school nights. Name the study type.	Sample survey.
2	A coach flips a coin to assign athletes to two warm-up routines, then compares jump heights. Name the study type and the role of the coin flip.	Experiment. The coin flip randomly assigns athletes to the two treatments.
3	Researchers record students' backpack weights and back-pain reports without changing anything. Name the study type.	Observational study.
4	A club asks the first 20 students who enter the cafeteria whether they like the new menu. Is this a random sample?	No. The first 20 students may not represent all students.

PART 2 • APPLY IT

1. **Sample survey. Random selection helps the 75 students represent the whole student body, so the council can estimate the population's opinion.** Students are asked a question, and no treatment is assigned. The random selection supports using the sample result to estimate all students' views.
2. **Experiment. The club can conclude that the five-minute break likely caused a higher average score for the club members in this experiment.** The club assigns the break treatment at random. Random assignment allows a cause-and-effect conclusion for these participants.

CHALLENGE

Plan A is an observational study. Plan B is an experiment. Plan B is best because random assignment of the water treatment allows a cause-and-effect conclusion about quiz scores.

Accept equivalent wording for random selection, random sampling, and random assignment. For the challenge, require that students identify Plan B and connect random assignment to cause and effect.