Who Chose What?

Sort studies by how their data were collected.

S.DC.1 "Distinguish among different types of study designs for collecting data, and know the scope of inference for each design type. Distinguish among sample surveys, experiments, and observational studies..."

NAME _____ DATE _____

EXPERIMENT

Researchers choose which condition each subject receives, then measure an outcome. Randomly assigning conditions can support a cause-and-effect conclusion.

A botanist chooses which tomato plants receive morning mist and compares their fruit weights.

OBSERVATIONAL STUDY

Researchers measure or ask about what is already happening without choosing subjects' conditions. An association in this kind of study does not, by itself, show cause and effect.

A naturalist notes crab shell colors and hiding behavior on a beach without changing the crabs' surroundings.

1 SORT

8 items

For Part 1, circle EXPERIMENT or OBSERVE for each study; for Part 2, choose two items, one from each category, and explain what detail led to each choice.

1.	A school randomly assigns students to solve puzzles with music or in silence, then times their work.	EXPERIMENT OBSERVE
2.	Researchers record teens' usual sleep hours and quiz scores without changing their bedtimes.	EXPERIMENT OBSERVE
3.	A city asks commuters about their usual routes and travel times without choosing anyone's route.	EXPERIMENT OBSERVE
4.	A clinic randomly assigns patients to one of two appointment reminders and counts missed visits.	EXPERIMENT OBSERVE
5.	A coach tells half the team to stretch before practice and half not to, then measures flexibility.	EXPERIMENT OBSERVE
6.	A bakery randomly assigns batches of dough to two oven temperatures, then compares how much they rise.	EXPERIMENT OBSERVE
7.	Researchers compare the yearly electricity use of homes with and without solar panels without assigning panels.	EXPERIMENT OBSERVE
8.	A museum randomly assigns visitors to see either a short video or a poster, then tests what they remember.	EXPERIMENT OBSERVE

2 PROVE IT

Explain your thinking

Choose two items, one from each category, and explain what detail led to each choice.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

For Part 3, write one new example of an experiment and one new example of an observational study.

EXPERIMENT _____

OBSERVE _____

CHALLENGE

Volunteers are randomly assigned to use one of two study apps, and one group earns higher test scores; can the researchers draw a cause-and-effect conclusion for the volunteers, and can they generalize the result to all students? Explain both.

ANSWER KEY

Who Chose What?

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	A school randomly assigns students to solve puzzles with music or in silence, then times their work.	**EXPERIMENT**	The school assigns the conditions before measuring the outcome.
2	Researchers record teens' usual sleep hours and quiz scores without changing their bedtimes.	**OBSERVE**	Researchers measure existing habits and scores without assigning a condition.
3	A city asks commuters about their usual routes and travel times without choosing anyone's route.	**OBSERVE**	The city collects survey responses about existing choices.
4	A clinic randomly assigns patients to one of two appointment reminders and counts missed visits.	**EXPERIMENT**	The clinic assigns the reminder method.
5	A coach tells half the team to stretch before practice and half not to, then measures flexibility.	**EXPERIMENT**	The coach chooses which players receive the stretching condition.
6	A bakery randomly assigns batches of dough to two oven temperatures, then compares how much they rise.	**EXPERIMENT**	The bakery assigns the oven temperatures.
7	Researchers compare the yearly electricity use of homes with and without solar panels without assigning panels.	**OBSERVE**	Researchers compare existing groups without assigning solar panels.
8	A museum randomly assigns visitors to see either a short video or a poster, then tests what they remember.	**EXPERIMENT**	The museum assigns what each visitor sees.

PART 2 · PROVE IT

Task: Choose two items, one from each category, and explain what detail led to each choice.
Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **EXPERIMENT**: A gardener assigns two groups of roses different amounts of water and measures the number of blooms.
- **OBSERVE**: A researcher records the ages and running speeds of dogs at a park without changing their activities.

Challenge: Random assignment supports a cause-and-effect inference about the apps for the volunteers. Because the volunteers were not randomly sampled from all students, the researchers cannot confidently generalize the result to all students.

Items 1, 4, 5, 6, and 8 are experiments; items 2, 3, and 7 are observational studies. For Part 2, accept explanations that identify whether researchers chose a condition or only collected data about existing conditions.