LESSON MAKER PRO

Chance and Choice

How selection and assignment shape a study

HIGH SCHOOL · A2S.DSP.D.26

A2S.DSP.D.26 "Describe the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each."

NAME _____ DATE _____

THE BIG IDEA

A sample survey asks questions, an observational study records what people already do, and an experiment assigns treatments. Random selection gives people a chance to enter a study. Random assignment puts participants into treatment groups by chance, making a cause-and-effect comparison more reliable.

WORKED EXAMPLE

A school randomly selects one student to ask how they travel to school. What is the chance the student rides a bike? What kind of study is this?

TRAVEL TO SCHOOL

Travel	Students
Bike	14
Walk	21

1. Count the students: 14 + 21 = 35.
2. Bike chance = 14/35 = 2/5.
3. The school asks a question, so this is a sample survey.

Answer: 2/5; sample survey

PRACTICE 4 problems

1 A school randomly selects 6 of 24 students to ask about lunch. Name the study type and find one student's chance of selection.

ANSWER _____

2 A club randomly assigns 8 of 16 volunteers to use a study app. Name the study type and find a volunteer's chance of getting the app.

ANSWER _____

3 A researcher randomly picks 5 of 25 existing study logs. Find one log's chance of selection. Did the researcher assign study methods?

ANSWER _____

4 A coach asks the first 7 of 28 players to arrive about sleep. Is each player's chance of selection 7/28? Explain.

ANSWER _____

APPLY IT Show your work

1 A media club randomly picks one subscription record from the table. What is the chance it shows an ad-free plan? Is comparing these existing plans an experiment?

STUDENTS' EXISTING PLANS

Plan	Records
With ads	15
Ad-free	25

ANSWER _____

2 A club randomly assigns 10 of 30 volunteers to try a new study app. The others use their usual notes. What is a volunteer's chance of getting the app? Why is this better for testing the app's effect than comparing current app users with nonusers?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A school randomly selects 9 of 45 students, then randomly assigns 3 of those 9 to use an app. What is the chance a particular student gets the app? What does each random step help accomplish?

WORK SPACE AND ANSWER

Chance and Choice

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A school randomly selects 6 of 24 students to ask about lunch. Name the study type and find one student's chance of selection.	**Sample survey; 6/24 = 1/4**
2	A club randomly assigns 8 of 16 volunteers to use a study app. Name the study type and find a volunteer's chance of getting the app.	**Experiment; 8/16 = 1/2**
3	A researcher randomly picks 5 of 25 existing study logs. Find one log's chance of selection. Did the researcher assign study methods?	**5/25 = 1/5; no**
4	A coach asks the first 7 of 28 players to arrive about sleep. Is each player's chance of selection 7/28? Explain.	**No. Arrival order is not random, so 7/28 is not a justified chance for each player.**

PART 2 · APPLY IT

1. **25/40 = 5/8; no, it is an observational study.** There are 40 records, and 25 show ad-free plans. The club did not assign plans.
2. **10/30 = 1/3; random assignment helps make the groups comparable.** Divide the 10 app assignments by 30 volunteers. Random assignment reduces differences between the groups that could affect the results.

CHALLENGE

9/45 × 3/9 = 1/15. Random selection helps the participants represent the school; random assignment helps make the treatment groups comparable.

Accept equivalent fractions. For the observational study, accept explanations that the researcher recorded existing choices rather than assigning them.