LESSON MAKER PRO

Who Gets Asked?

Use numbers to judge how well a sample reflects a group.

GRADE 7 · 7.DS.A.1.b

7.DS.A.1.b "Explain how a random sample increases the likelihood that the sample represents the population."

NAME _____ DATE _____

THE BIG IDEA

Drawing names at random from the whole population gives each person an equal chance to be chosen. This makes the sample more likely to reflect the population than asking people in just one place, but it does not guarantee a perfect match. To predict how many people from a group will be in a sample, multiply the group's fraction of the population by the sample size.

WORKED EXAMPLE

A school randomly selects 10 students. About how many bus riders would you expect? Why not ask only bus riders?

HOW STUDENTS TRAVEL TO SCHOOL

Travel	Students
Bus	20
Other	30

1. There are 20 + 30 = 50 students.
2. Bus riders make up 20/50 = 2/5 of the students.
3. Expect 10 × 2/5 = 4 bus riders.

Answer: About 4 bus riders. Asking only bus riders would leave out other students.

PRACTICE 4 problems

1 Of 72 students, 36 prefer art. About how many would you expect in a random sample of 18?

ANSWER _____

2 Of 84 students, 28 belong to the photography club. About how many would you expect in a random sample of 21?

ANSWER _____

3 Of 75 students, 45 play video games. In a sample of 25, 21 play video games. What percent of the population and what percent of the sample play?

ANSWER _____

4 A school has 63 students, including 14 band members. What is a band member's chance of being chosen if 9 names are drawn at random? What is the chance if band members are left out?

ANSWER _____

APPLY IT Show your work

1 A game studio draws 16 names from all 96 testers. About how many puzzle fans would you expect? Why might asking at a sports-game meetup give a different result?

TESTERS' FAVORITE GAMES

Game type	Testers
Puzzle	36
Sports	60

ANSWER _____

2 A music app randomly samples 24 of its 120 teen users. Nine sampled users like jazz. Estimate how many teen users like jazz. Why is asking only jazz-club volunteers less reliable?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Which sample better represents robotics membership at this school? Find the robotics percentage in each row, then explain how the selection methods matter.

ROBOTICS MEMBERSHIP

Group	Total	In robotics
All students	100	40
Sample A: names drawn	25	11
Sample B: tech fair	25	22

WORK SPACE AND ANSWER

ANSWER KEY

Who Gets Asked?

GRADE 7 · 7.DS.A.1.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Of 72 students, 36 prefer art. About how many would you expect in a random sample of 18?	**9 students**
2	Of 84 students, 28 belong to the photography club. About how many would you expect in a random sample of 21?	**7 students**
3	Of 75 students, 45 play video games. In a sample of 25, 21 play video games. What percent of the population and what percent of the sample play?	**Population: 60%; sample: 84%**
4	A school has 63 students, including 14 band members. What is a band member's chance of being chosen if 9 names are drawn at random? What is the chance if band members are left out?	**Random draw: 9/63 = 1/7; band members left out: 0**

PART 2 · APPLY IT

1. **About 6 puzzle fans. A sports-game meetup is more likely to include sports-game fans.** Puzzle fans are 36/96 of testers, and 16 × 36/96 = 6. Drawing from all testers avoids favoring those at one meetup.
2. **About 45 teen users. Jazz-club volunteers are more likely to like jazz.** Use the sample fraction: 9/24 × 120 = 45. Sampling only from a jazz club favors jazz fans.

CHALLENGE

All students: 40%; sample A: 44%; sample B: 88%. Sample A is closer to the school percentage. Drawing names gives all students a chance, while a tech fair may attract more robotics members.

Accept equivalent fractions and reasonable rounding of estimates. A random sample is more likely to represent the population, but it is not guaranteed to match it exactly.