LESSON MAKER PRO

Fair Sample Choices

Use size and randomness to plan a representative sample.

GRADE 7 · 7.PS.2.c

7.PS.2.c "Determine how sample size and randomness will ensure that the data collected is a sample that is representative of a larger population."

NAME _____ DATE _____

REPRESENTATIVE SAMPLES

A random sample gives every person in the population a fair chance to be chosen. A larger random sample is usually more likely to represent the whole population than a smaller random sample.

WORKED EXAMPLE

A randomly ordered list has 200 student names. A survey needs 25 names. What fraction of the students will be sampled, and how can the names be chosen randomly?

1. Write the sample fraction: 25/200.
2. Divide numerator and denominator by 25.
3. 25/200 = 1/8.
4. Use a random number generator to choose 25 different numbers from 1 to 200.

Answer: 1/8 of the students; choose 25 different random numbers from 1 to 200.

PRACTICE 4 problems

1 A school has 180 students. Which plan is more likely to be representative: randomly choose 24 students, or ask 24 students at one lunch table? Explain.

ANSWER _____

2 A poll uses a random sample of 20 out of 100 students. What fraction of the population is sampled?

ANSWER _____

3 Which sample is a larger fraction of its population: 35 of 140 or 18 of 90? Show the fractions.

ANSWER _____

4 To survey 72 students, a random number generator picks 12 different numbers from 1 to 72. Why must the numbers be different?

ANSWER _____

APPLY IT Show your work

1 The school wants opinions about a new game room. There are 280 students. Maya uses a random number generator to select 28 student ID numbers. Is her method likely to give a representative sample? Explain.

WORK SPACE

ANSWER _____

2 A random survey asks students in each grade whether they want longer recess. Use the table. Does the sample include the same fraction from each grade?

SCHOOL SURVEY

Grade	Students	Randomly Surveyed
6	110	11
7	150	15
8	140	14

ANSWER _____

CHALLENGE One step up

A club has 500 members: 225 play basketball, 175 make art, and 100 build robots. The club wants a random sample of 40 members that keeps the same group proportions. How many members should be randomly chosen from each group? Explain how to choose them.

WORK SPACE AND ANSWER

ANSWER KEY

Fair Sample Choices

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A school has 180 students. Which plan is more likely to be representative: randomly choose 24 students, or ask 24 students at one lunch table? Explain.	**Randomly choose 24 students. Students at one lunch table may have similar opinions, so that group may not represent the whole school.**
2	A poll uses a random sample of 20 out of 100 students. What fraction of the population is sampled?	**1/5**
3	Which sample is a larger fraction of its population: 35 of 140 or 18 of 90? Show the fractions.	**35/140 = 1/4, and 18/90 = 1/5. The sample of 35 out of 140 is the larger fraction.**
4	To survey 72 students, a random number generator picks 12 different numbers from 1 to 72. Why must the numbers be different?	**Different numbers prevent the same student from being chosen twice. The sample will include 12 students.**

PART 2 · APPLY IT

1. **Yes. The IDs are chosen randomly, so each student has a fair chance to be selected, and 28 students is a reasonable sample size.** The selection is random rather than based on volunteers or friends. The sample includes many students from the population.
2. **Yes. Each grade has 1/10 of its students surveyed: 11/110, 15/150, and 14/140 all equal 1/10.** Simplify each grade's surveyed fraction. Because each is 1/10 and the students were selected randomly, the grade levels are represented proportionally.

CHALLENGE

Choose 18 basketball players, 14 art members, and 8 robotics members. Randomly select that many different members from each group.

Accept equivalent fractions and clear statements that random selection gives all members a fair chance. For the challenge, accept any method that randomly selects 18, 14, and 8 different members from the three groups.