

Grade 7 · Random Sampling and Making Inferences · Quiz

Common Core 7.SP.A.1, 7.SP.A.2 · mathovore.fr

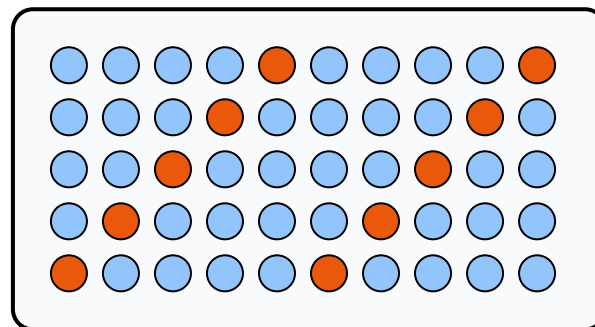
Name: _____ Date: ____/____/____ Score: _____

Ten multiple-choice questions check populations and samples, random and biased sampling, and estimates from samples. Several questions include a diagram. Choose the one correct answer, then read the explanation to see the common mistake behind each wrong choice.

Grade 7 Common Core: 7.SP.A.1 · 7.SP.A.2

Questions

Question 1



Population: 500 students
Sample: 50 students chosen at random

Quiz figure.

A principal surveys 50 randomly chosen students out of 500. What is the sample?

- A. All 500 students in the school
- B. The principal who ran the survey
- C. The question that was asked
- D. The 50 students who were surveyed

Question 2

Which method gives a random sample of the students in a school?

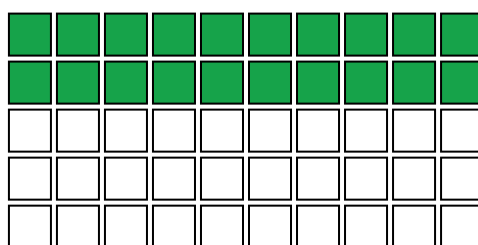
- A. Ask the first 30 students who arrive at practice
- B. Draw 30 names from a hat holding every student's name
- C. Survey the 30 members of the chess club
- D. Ask 30 students who are leaving the gym

Question 3

A pizzeria asks 40 customers which topping they like best to find the favorite topping in the whole town. Why is the sample biased?

- A. Forty is always too small to be random
- B. The survey asked about toppings, not crusts
- C. People who eat at a pizzeria may not represent the whole town
- D. A survey must ask exactly 100 people

Question 4



20 of 50 students ride the bus

Quiz figure.

In a random sample of 50 students, 20 ride the bus. About how many of the 800 students ride the bus?

- A. 320 students
- B. 160 students
- C. 400 students
- D. 640 students

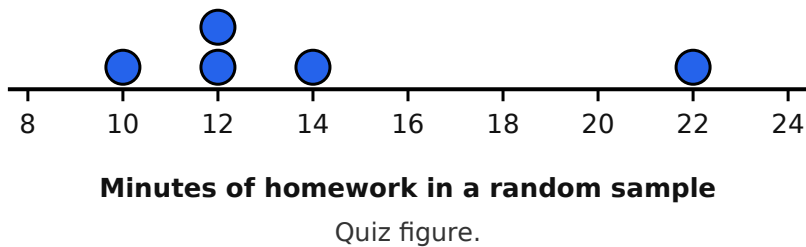
Question 5

Which sample is likely to give the most reliable estimate of the percent of students who like a new cafeteria menu?

- A. 10 students chosen at random from the whole school
- B. 20 students chosen at random from the whole school

- C. 200 students chosen only from the band
- D. 200 students chosen at random from the whole school

Question 6



A random sample of 5 students reports their math homework time, in minutes. What is the sample mean?

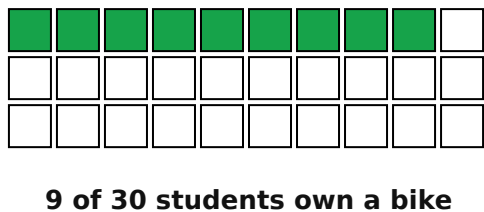
- A. 12 minutes
- B. 22 minutes
- C. 14 minutes
- D. 70 minutes

Question 7

Three random samples of 40 students each from the same school give 14, 18, and 16 students who walk. Why do the results differ?

- A. Random samples vary from one sample to the next
- B. Someone must have counted wrong
- C. The school changed between samples
- D. Only the largest result is correct

Question 8



In a random sample of 30 students, 9 own a bike. About how many of 1,500 students own a bike?

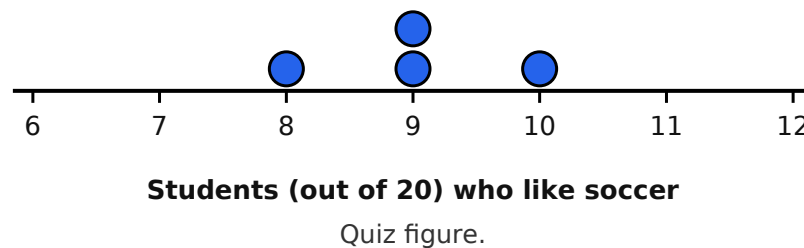
- A. 300 students
- B. 270 students
- C. 450 students
- D. 500 students

Question 9

A random sample of 50 voters shows that 36 prefer a new library. What is the best estimate of the percent of all voters who prefer it?

- A. About 36%
- B. About 72%
- C. About 14%
- D. About 50%

Question 10



Four random samples of 20 students gave the counts shown who like soccer. What is the best estimate of the percent of all students who like soccer?

- A. 45%
- B. 40%
- C. 50%
- D. 36%

Answer key

1. **D** - The sample is the part of the population that is actually surveyed. All 500 students form the population.
2. **B** - Only the hat method gives every student an equal chance. The others favor a group of students.
3. **C** - The customers are not typical of everyone in town, so some residents had no chance to be chosen. Small size alone does not make a sample biased.
4. **A** - The proportion is $\frac{20}{50} = 0.4$, and $0.4 \times 800 = 320$. Multiplying 20×8 gives 160.
5. **D** - A large random sample varies less. The band sample is large but biased.
6. **C** - Sum: $10 + 12 + 12 + 14 + 22 = 70$, and $70 \div 5 = 14$. The value 12 is the median, and 70 is only the sum.
7. **A** - Different random samples include different students, so results vary. This is sampling variation, not a mistake.
8. **C** - The proportion is $\frac{9}{30} = 0.3$, and $0.3 \times 1500 = 450$. The value 500 divides the population by 3.
9. **B** - $\frac{36}{50} = 0.72$, which is 72%. The value 36% treats the count as a percent.
10. **A** - The mean count is $\frac{8+10+9+9}{4} = 9$, and $\frac{9}{20} = 45\%$. Using only one sample gives 40% or 50%.

Remember:

- A population is the whole group; a sample is a part of it.
- A random sample gives every member an equal chance of selection.
- Biased samples favor some members and lead to unreliable inferences.
- Estimate a population count: sample proportion times population size.
- Different random samples vary; larger samples vary less.