

Random Samples and Population Inferences

Grade 7 math · Test · Standards: 7.SP.A.1, 7.SP.A.2

Name: _____ Date: _____ Class: _____

This test has 8 questions worth 20 points on populations, random samples, estimates and variation between samples. Allow 45 minutes, show each calculation and give a reason whenever a question asks you to explain.

Standards: 7.SP.A.1, 7.SP.A.2 · **Level:** Grade 7

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Population and sample (2 points)

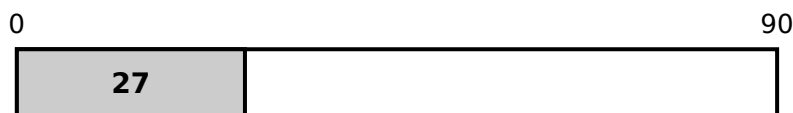
A bakery owner wants to know which muffin flavor customers like best. She asks 60 of her 400 regular customers. (a) Identify the population. (1 point) (b) Identify the sample. (1 point)

Question 2 Random or biased (3 points)

Decide whether each method gives a random sample or a biased sample of all 500 students in a school, and give a reason. (a) Put every student number in a bin and draw 40. (1 point) (b) Survey 40 students in the band room. (1 point) (c) Survey the first 40 students who answer an e-mail poll. (1 point)

Question 3 Hiker survey (2 points)

A random sample of 90 hikers on a trail shows that 27 carry paper maps.



27 of 90 hikers

Sample of 90 hikers.

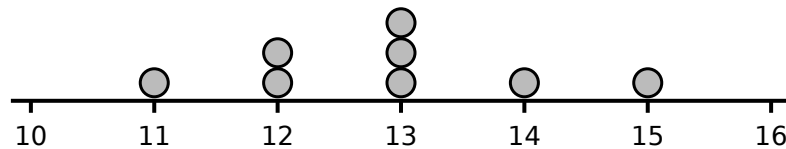
About 1,800 hikers use the trail in a season. Estimate how many carry paper maps. (2 points)

Question 4 Pumpkin weights (3 points)

A random sample of 10 pumpkins from a field of 350 has these weights in pounds: 12, 9, 14, 11, 10, 13, 12, 8, 11, 10. (a) Find the mean weight. (1 point) (b) Estimate the total weight of the 350 pumpkins. (1 point) (c) Explain why the pumpkins in the sample should be picked at random. (1 point)

Question 5 Bike ownership samples (3 points)

Eight random samples of 20 students were asked if they own a bike. The number answering yes in each sample is shown.



Students who own a bike, out of 20

Eight samples of 20 students.

- Find the least and greatest sample percent. (1 point)
- The middle value is 13. Find the percent it represents. (1 point)
- Use that percent to estimate how many of the 900 students own a bike. (1 point)

Question 6 Spot the bias (2 points)

A radio station asks listeners to call in and name their favorite kind of music, then announces the favorite music of everyone in town. Explain two reasons this result could be misleading. (2 points)

Question 7 Combining samples (3 points)

A random sample of 40 fish from a lake had 14 with a parasite. A second random sample of 60 fish had 24 with the parasite. (a) Find the percent in each sample. (1 point) (b) Find the percent for the two samples combined. (1 point) (c) Use the combined percent to estimate how many of the 5,000 fish in the lake have the parasite. (1 point)

Question 8 Computer-drawn sample (2 points)

A school with 780 students picks 30 student ID numbers using a random number generator on the full roster. In the sample, 12 students want a longer recess. (a) Is this a random sample? (1 point) (b) Estimate how many of the 780 students want a longer recess. (1 point)