

Random Samples and Population Inferences

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

The answer key shows each calculation and the reasoning expected for the explain questions. Give full credit for reasons that name who was left out of the sample, and use the scoring line to award partial credit.

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

Question 1 Population and sample (2 points)

- a. The population is **all 400 regular customers**.
- b. The sample is **the 60 customers who were asked**.

Scoring: 1 point for each part.

Question 2 Random or biased (3 points)

- a. **Random:** each student has an equal chance.
- b. **Biased:** band members are not typical of all students and others are left out.
- c. **Biased:** only students who read and choose to answer are included.

Scoring: 1 point per part for the correct label with a reason.

Question 3 Hiker survey (2 points)

$27 \div 90 = 0.30$. Estimate: $0.30 \times 1,800 = 540$.

About 540 hikers

Scoring: 1 point for the proportion, 1 point for the estimate.

Question 4 Pumpkin weights (3 points)

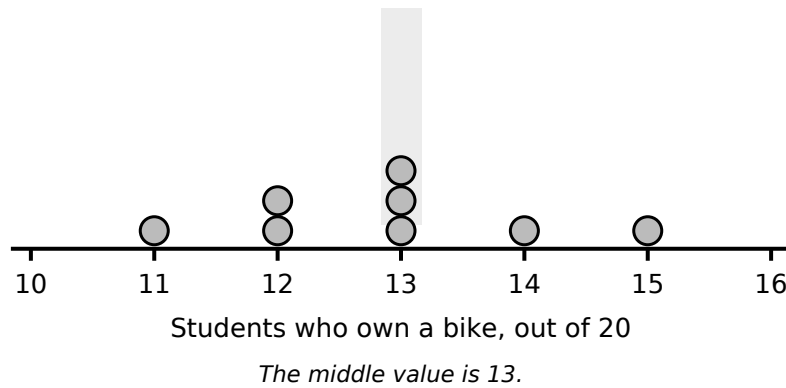
- a. Sum = 110, so the mean is $110 \div 10 = \mathbf{11 \text{ lb}}$.
- b. $350 \times 11 = \mathbf{3,850 \text{ lb}}$.
- c. Random picking gives every pumpkin a fair chance, so the sample is not tilted toward large or small pumpkins.

Scoring: 1 point for each part.

Question 5 Bike ownership samples (3 points)

- a. $11 \div 20 = 55\%$ and $15 \div 20 = 75\%$: **55% to 75%**.
- b. $13 \div 20 = 65\%$.
- c. $0.65 \times 900 = 585$ **students**.

Scoring: 1 point for each part.



Question 6 Spot the bias (2 points)

Only listeners of that station can call, and only the people who choose to call are counted. Neither group is a random sample of the town.

The sample is biased because it includes only listeners who choose to call.

Scoring: 1 point for each valid reason.

Question 7 Combining samples (3 points)

- a. $14 \div 40 = 35\%$ and $24 \div 60 = 40\%$.
- b. $(14 + 24) \div (40 + 60) = 38 \div 100 = 38\%$.
- c. $0.38 \times 5,000 = 1,900$ **fish**.

Scoring: 1 point for each part.

Question 8 Computer-drawn sample (2 points)

- a. **Yes**, because every student on the roster has an equal chance of being chosen.
- b. $12 \div 30 = 0.40$ and $0.40 \times 780 = 312$ **students**.

Scoring: 1 point for each part.