

Grade 7 - Random Sampling and Inference - Answer Key

Common Core 7.SP.A.1, 7.SP.A.2 · maths-pdf.fr/en/

Use this answer key to check your work on the random sampling worksheet. Every solution shows the steps, and the final answer appears in bold. If your answer is different, compare each step and look for the first place where the work changes.

Grade 7 · Common Core State Standards: **7.SP.A.1, 7.SP.A.2**

Exercise 1 - Population and sample

Population: all 600 students.

Sample: the 40 students surveyed.

Population: 600 students; sample: 40 students

Exercise 2 - Biased or not?

No. Team members are more likely to like basketball than other students, so the sample is biased.

Biased

Group asked	Sport liked
Basketball team	basketball
All students	many sports

The sample does not match the population.

Exercise 3 - Random method

(b) gives every student an equal chance of being chosen.

(a) favors students who arrive early.

(b)

Exercise 4 - Pizza estimate

Sample proportion: $50 \div 200 = 0.25 = 25\%$.

$$0.25 \times 1200 = 300$$

About 300 students

Sample	Population
50 of 200 = 25%	25% of 1,200 = 300

Estimate.

Exercise 5 - Library visits

$$18 \div 60 = 0.3.$$

$$0.3 \times 800 = 240$$

About 240 students

Exercise 6 - Marbles in a jar

$$7 \div 25 = 0.28.$$

$$0.28 \times 400 = 112$$

About 112 red marbles

Exercise 7 - Sample size

Larger random samples vary less, so Jamal's estimate is likely to be closer.

Jamal's sample of 100

Exercise 8 - Election poll

$$96 \div 150 = 0.64 = 64\%.$$

$$0.64 \times 12500 = 8000$$

About 8,000 voters

Exercise 9 - Quality control

$$8 \div 200 = 0.04.$$

$$0.04 \times 5000 = 200$$

About 200 chargers

Exercise 10 - Tag and count

In the sample, $\frac{5}{40} = \frac{1}{8}$ of the fish are tagged.

So the 50 tagged fish are about $\frac{1}{8}$ of all fish: $50 \times 8 = 400$

About 400 fish

Tagged in sample	Sample size	Fraction
5	40	1/8

One eighth tagged.

Exercise 11 - Question wording

The wording suggests the answer the writer wants, so more people will say yes.

The question leads respondents

Exercise 12 - Random numbers

Skip the repeated number 7.

7, 22, 15, 30, 3

Exercise 13 - Mean of samples

$$(22+25+19+24) \div 4 = 90 \div 4 = 22.5$$

22.5 minutes

Exercise 14 - Compare two samples

Order: 4, 5, 5, 6, 6, 6, 7, 7, 8. The median is the fifth value, 6.

$$6 \div 20 = 0.30 = 30\%$$

Median 6; about 30%

Exercise 15 - Cafeteria

$$36 \div 120 = 0.3.$$

$$0.3 \times 900 = 270$$

About 270 students

Exercise 16 - Bike riders

$$12 \div 50 = 0.24.$$

$$0.24 \times 2500 = 600$$

About 600; a sample can differ from the whole population

Exercise 17 - Two samples

Chance causes sampling variability: random samples differ.

Combine the samples or use a larger sample: $\frac{6+4}{20} = 50\%$.

Both vary by chance; use a larger sample

Exercise 18 - Movie night

$$45 \div 150 = 0.3.$$

$$0.3 \times 3000 = 900 \text{ want comedy; } 3000 - 900 = 2100 \text{ do not.}$$

About 900 want comedy; about 2,100 do not

Exercise 19 - Park survey

$$9 \div 30 = 0.3.$$

$$0.3 \times 10000 = 3000.$$

A small sample varies a lot; a larger sample would give a more reliable estimate.

About 3,000

Exercise 20 - Hours of sleep

$$\text{Sum: } 7+7+7+8+8+8+8+8+9+9+9+10 = 98.$$

$$98 \div 12 \approx 8.2$$

About 8.2 hours