Random Sampling Worksheet

Grade 7 · Common Core 7.SP.A.1

> Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

Practice

Builds the skill step by step.

1. A principal wants to know students' favorite lunch. Which is a random sample?
   A. Ask the first 50 students in the lunch line
   B. Ask the soccer team
   C. Draw 50 names from a list of all students
   D. Ask the students who stay after school

2. In a survey, what is the population?
   A. The whole group you want to learn about
   B. A small part of the group
   C. Only the people who answer the survey
   D. The number of people in a town

3. A survey asks people at a gym how often they exercise. Why might the results be biased?
   A. The sample is random.
   B. The question is too short.
   C. Gyms are open late.
   D. People at a gym probably exercise more than most people.

4. A school has 600 students. A random sample of 60 students is surveyed. What fraction of the students are in the sample?

5. Which sample is most likely to represent all the 7th graders in a school?

   A. 20 seventh graders in the chess club

   B. The 20 tallest seventh graders

   C. 20 seventh graders who volunteer

   D. 20 seventh graders chosen by a random number generator

6. A city wants to know if residents support a new park. Which question is fair?

   A. Don't you agree a beautiful new park would help our city?

   B. Would you rather waste money or build a park?

   C. Do you oppose the park that everyone wants?

   D. Do you support building a new park?

7. Which sample is likely to be biased?

   A. Asking people at a library how much they like reading

   B. Drawing 100 names at random from all city residents

   C. Picking every 10th name from a complete student list

   D. Using a random number generator to pick students

8. In a random sample of 40 students, 12 walk to school. What percent of the sample walks?

9. Why do larger random samples usually give better estimates?

   A. A few unusual results matter less.

   B. They always give the exact answer.

   C. They are cheaper.

   D. They include only people who agree.

10. A teacher numbers students 1 to 150 and uses a random number generator to pick 15 numbers. What kind of sample is this?

    A. A biased sample

    B. A random sample

    C. A convenience sample

    D. The whole population

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On Level

Grade-level practice.

1. A store wants to know what customers think of its service. Which method gives the most representative sample?

   A. Survey every 20th customer at checkout for a full week

   B. Survey customers who send complaints

   C. Survey only morning customers on Monday

   D. Post a survey on the store's social media page

2. In a random sample of 50 voters, 32 support a new library. Out of 5,000 voters, about how many support it?

3. A website asks visitors to vote for their favorite sport, and 70% vote for soccer. Why might this not represent all people?

   A. Only people who chose to visit and vote are counted.

   B. The sample is too large.

   C. Soccer is popular.

   D. The votes are anonymous.

4. In a random sample of 80 light bulbs, 4 are defective. About how many of 2,000 bulbs are defective?

5. A survey asks 30 students in the gym about their favorite class. Which change would make the sample less biased?

   A. Choose 30 students at random from the whole school

   B. Ask 30 more students in the gym

   C. Ask only the students who like gym

   D. Ask the gym teacher

6. One random sample of 25 students has a mean of 3.2 hours of homework a week. Another has a mean of 3.6 hours. What is the difference between the two sample means?

7. A survey of 200 randomly chosen students found 45% prefer pizza. Which is the best conclusion?

   A. About 45% of all the students likely prefer pizza.

   B. Exactly 45% of all students prefer pizza.

   C. Most students prefer pizza.

   D. Pizza is the healthiest lunch.

8. A farm has 1,200 apple trees. A random sample of 30 trees has 6 with a disease. Estimate how many trees have the disease.

9. Why is asking only your friends a poor way to learn about your whole school?

   A. Friends never tell the truth.

   B. It takes too long.

   C. It is a random sample.

   D. Friends may share interests and not represent everyone.

10. In a random sample of 120 students, 42 own a pet. What percent own a pet?

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Challenge

Multi-step and word problems that stretch it.

1. Two random samples of 50 students were asked if they want a longer lunch. Sample A had 34 yes answers. Sample B had 30. Combine the samples to estimate how many of 900 students want a longer lunch.

2. A town of 10,000 people has 4 neighborhoods of equal size. A survey picks 100 people, all from one neighborhood. What is the main problem?

   A. 100 people is always too few.

   B. The other three neighborhoods are left out.

   C. The survey is random.

   D. Neighborhoods don't affect opinions.

3. A sample of 40 phones has a mean battery life of 18.5 hours. A second sample of 60 phones has a mean of 19.5 hours. What is the mean for all 100 phones?

4. A coach wants to estimate the average height of all 7th graders. She measures her basketball team. Which statement is true?

   A. The estimate is fine because the team is random.

   B. The estimate is likely too low.

   C. The estimate is likely too high, because basketball players tend to be tall.

   D. The estimate is exact.

5. In a random sample of 75 students, 27 ride the bus. The school has 850 students. About how many ride the bus?

6. Each sample is chosen at random. Which sample size gives the most reliable estimate of a school's opinion?

   A. 20 students

   B. 10 students

   C. 5 students

   D. 200 students

7. A random survey of 40 households counted TVs: 10 households had 1, 18 had 2, 8 had 3 and 4 had 4. What is the mean number of TVs per household in the sample?

8. A news site reports, "A survey of our readers shows 80% support the new law." Why should you be careful with this claim?

   A. 80% is too high to be true.

   B. Readers chose to answer and may not represent all people.

   C. Surveys are always wrong.

   D. The law is new.

9. A random sample of 30 seventh graders read a mean of 12 books last year. There are 270 seventh graders. Estimate the total number of books they read.

10. A factory checks a random sample of 150 parts and finds 3 defective. It makes 12,000 parts a day. Estimate the number of defective parts per day, and give the defect rate as a percent.