LESSON MAKER PRO

Compare the Samples

Use random-sample percentages to estimate two populations.

HIGH SCHOOL · MA.912.DP.5.8

MA.912.DP.5.8 "Draw inferences about two populations using data and statistical analysis from two random samples."

NAME _____ DATE _____

MAKE A POPULATION INFERENCE

A sample percentage is a point estimate of a population percentage. Compare the estimates, but random samples vary: a sample difference alone does not establish a reliable population difference. Consider sample sizes and uncertainty before claiming one population's true rate is higher.

WORKED EXAMPLE

A random sample from Population A has 18 of 24 people who prefer option X. A random sample from Population B has 10 of 25 people who prefer option X. Which population is estimated to have a higher percentage?

1. Population A: 18/24 = 3/4 = 75%.
2. Population B: 10/25 = 2/5 = 40%.
3. Compare 75% and 40%.

Answer: Population A is estimated to have a higher percentage, by 35 percentage points.

PRACTICE 4 problems

1 Random samples show that 14 of 20 people in Population A and 9 of 15 people in Population B support a proposal. Find both percentages and their difference. What can and cannot be concluded from these point estimates alone?

ANSWER _____

2 In two random samples, 28 of 40 students in Group 1 and 22 of 40 students in Group 2 report reading for fun each week. What is the estimated difference in percentage points? Which group is higher?

ANSWER _____

3 A random sample from one population has 16 of 32 people choosing a new app. A random sample from another population has 21 of 35 people choosing it. Which population is estimated to have the higher percentage?

ANSWER _____

4 Random samples show that 52 of 80 people in Population A and 39 of 60 people in Population B favor a later start time. What does the data suggest about the two populations?

ANSWER _____

APPLY IT Show your work

1 The student council takes random samples to plan a school event. Of 80 ninth graders sampled, 48 want a music performance. Of 65 twelfth graders sampled, 39 want a music performance. What can the council infer about the two grades?

2 Two schools survey random samples about adding a quiet study period after school. At North High, 54 of 90 students support it. At South High, 35 of 70 students support it. Which school is estimated to have stronger support, and by how much?

CHALLENGE One step up

Random samples show that 42 of 70 people in Population A and 36 of 60 people in Population B prefer online registration. A student says, "The two populations have exactly the same preference rate." Is that claim proven by the samples? Explain.

ANSWER KEY

Compare the Samples

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Random samples show that 14 of 20 people in Population A and 9 of 15 people in Population B support a proposal. Find both percentages and their difference. What can and cannot be concluded from these point estimates alone?	**A: 70%; B: 60%; A's point estimate is 10 percentage points higher. These small samples alone do not establish that A's true population rate is higher. Population counts also cannot be compared without population sizes.**
2	In two random samples, 28 of 40 students in Group 1 and 22 of 40 students in Group 2 report reading for fun each week. What is the estimated difference in percentage points? Which group is higher?	**Group 1's point estimate is higher by 15 percentage points; this is not by itself proof of a population difference.**
3	A random sample from one population has 16 of 32 people choosing a new app. A random sample from another population has 21 of 35 people choosing it. Which population is estimated to have the higher percentage?	**The second population, 60% compared with 50%.**
4	Random samples show that 52 of 80 people in Population A and 39 of 60 people in Population B favor a later start time. What does the data suggest about the two populations?	**Both populations are estimated to have the same percentage, 65%, favoring a later start time.**

PART 2 · APPLY IT

1. **Both grades are estimated to have 60% of students wanting a music performance, so the data suggests similar support.** Compute 48/80 = 60% and 39/65 = 60%. The equal sample percentages estimate equal population percentages.
2. **North High is estimated to have stronger support by 10 percentage points.** Compute 54/90 = 60% and 35/70 = 50%. Compare the estimates: 60% - 50% = 10 percentage points.

CHALLENGE

No. Both samples have an estimated preference rate of 60%, so the data suggests similar population rates, but random samples cannot prove that the population rates are exactly equal.

Accept correct fractions, decimals and percentages. Distinguish sample estimates from true population values. Qualifying a claim with likely is not a substitute for assessing sampling variability; accept conclusions limited to the observed point estimates.