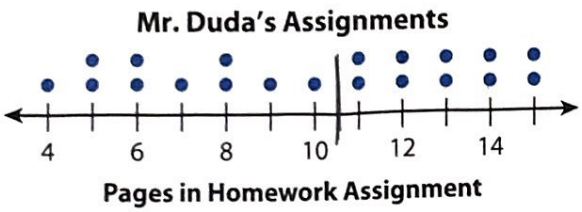
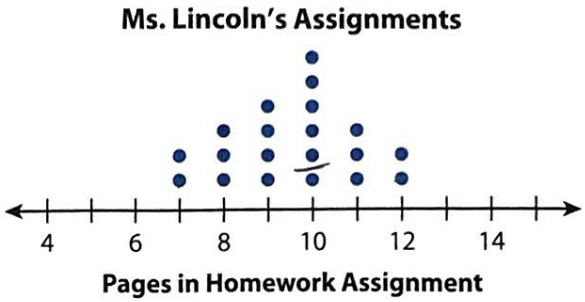
Develop Comparing Two Populations

➤ **Read and try to solve the problem below.**

The principal wants students in all social studies classes to have similar amounts of homework. The principal selects a random sample of 20 homework assignments each from Mr. Duda's and Ms. Lincoln's lesson plans. Who assigns more homework? How do you know?





TRY IT

Math Toolkit counters, grid paper, number lines

Median Pages

Mr. Duda
$10\frac{1}{2}$ pgs

Ms Lincoln
10 pgs

Mr. Duda assigns more homework

DISCUSS IT

Ask: How is your strategy similar to mine? How is it different?

Share: My strategy is similar to yours . . . It is different . . .

DISCUSS IT *continued*

➤ **Explore different ways to compare two populations by using random samples from each population.**

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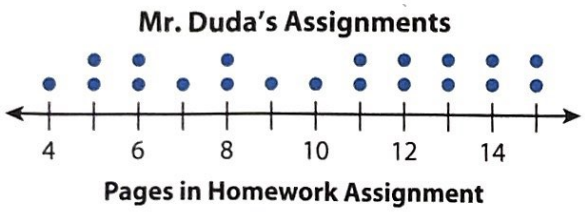
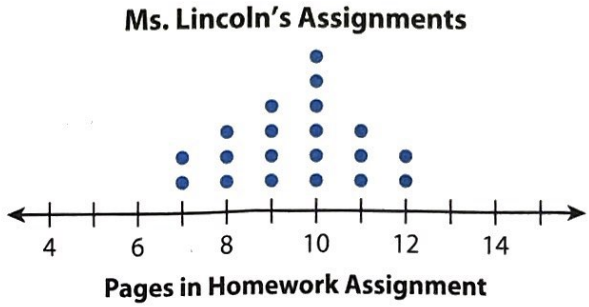
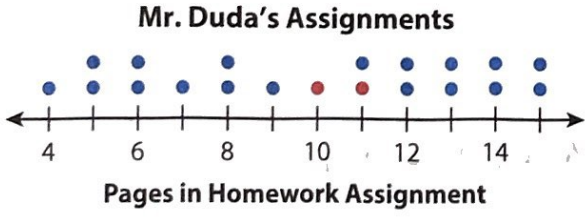


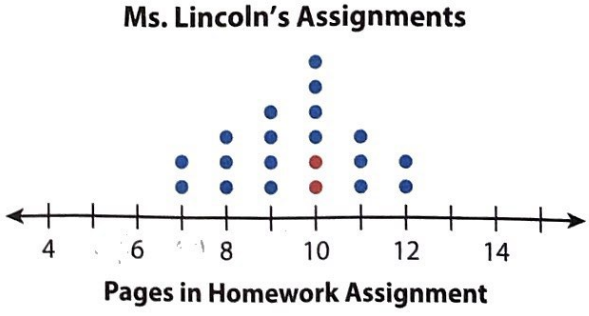


Picture It

You can compare two data sets by finding and comparing their medians.



The median of Mr. Duda's sample is 10.5.



The median of Ms. Lincoln's sample is 10.

Analyze It

You can compare two data sets by finding and comparing their means.

Mr. Duda

Mean of sample: 9.9

Inferred mean of population: about 9.9

Ms. Lincoln

Mean of sample: 9.55

Inferred mean of population: about 9.55

CONNECT IT

➤ **Use this page to deepen your understanding of comparing two populations by using random samples from each population.**

1 Talk About It

a. Look at **Analyze It**. Why are the inferences about Mr. Duda's and Ms. Lincoln's samples reasonable?

Random samples resemble the populations they are drawn from. When something is true about a random sample, you can reasonably expect it to be true of the population

b. The median of Ms. Lincoln's sample is greater than the mean of Mr. Duda's sample. Why can you not infer that Ms. Lincoln gives more homework?

Median & mean are different measures of center so you can't compare the two.

2 Show What You Know

When can you compare an inference about one population to an inference about another population?

When both are based on random samples and when using the same measure to compare.

3 Reflect Think about all the models and strategies you have discussed today. Describe how one of them helped you better understand how to compare two populations.

Apply It

➤ **Use what you learned to solve these problems.**

4 Roberto and Amata each have a bag of 360 marbles. Roberto draws 10 marbles from his bag, records the number that are green, and replaces the marbles. He does this 20 times. Amata does the same with her bag. Do you expect that Roberto's or Amata's bag has more green marbles? About how many more? Show your work.

Mean Number of Green Marbles	
Roberto's Samples	4.9
Amata's Samples	2

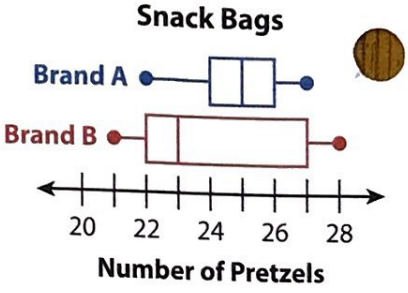
$\frac{4.9}{10} = 49\%$ $\quad 0.49(360) = 176.4$

$\frac{2}{10} = 20\%$ $\quad 0.2(360) = -72$

104.4

SOLUTION Roberto will have about 104 more green marbles

5 The box plots show the number of pretzels in random samples of 30 snack bags from each of two brands. Which brand typically has more pretzels in a bag? Which brand has a more consistent number of pretzels in a bag? Explain how you can use the data from the random samples to decide.



Brand A has more pretzels. The median is greater than Brand B

Brand A has a more consistent number of pretzels because the data is less spread out.

6 River County has 15,000 likely voters. A survey of 100 voters selected at random in River County finds that 60 plan to vote to re-elect the current governor. Lake County has 12,000 likely voters. A survey of 125 voters selected at random in Lake County finds that 90 plan to vote to re-elect the current governor. In which county can the current governor expect to get more votes? Show your work.

River $\frac{60}{100} \overset{\times 150}{=} \frac{9000}{15000}$ $\quad \frac{90}{125} \overset{\times 96}{=} \frac{8640}{12000}$ Lake

SOLUTION The governor can expect more votes in River County