LESSON MAKER PRO

Center Gap Detective

Compare centers, variability, and overlap.

GRADE 7 · 7.SP.B.3

CCSS.Math.Content.7.SP.B.3 "Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example..."

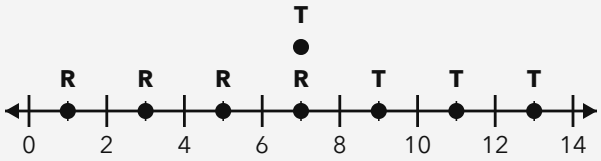
NAME _____ DATE _____

COMPARE THE GAP

Subtract the centers, then divide by a typical MAD. A larger multiple usually means less overlap, but check the data display for shared or nearby values.

WORKED EXAMPLE

The number line shows scores for groups R and T. Each group has a MAD of 2. How many MADs apart are the centers? What overlap do you notice?



1. Mean of R = (1 + 3 + 5 + 7) / 4 = 4.
2. Mean of T = (7 + 9 + 11 + 13) / 4 = 10.
3. Center difference = 10 - 4 = 6.
4. 6 / 2 = 3 MADs. Both groups have a score of 7.

Answer: The centers are 3 MADs apart. The groups have little overlap because they share only 7.

PRACTICE 4 problems

1 Two groups have means of 18 and 24. Their MADs are both 3. How many MADs apart are the means?

ANSWER _____

2 Two distributions have means of 50 and 52. Both MADs are 4. Find the center difference as a multiple of MAD. Would you expect much overlap?

ANSWER _____

3 The means are 14 and 23, and both MADs are 3. How many MADs apart are the centers? Describe the likely overlap.

ANSWER _____

4 A student says that two distributions with means 8 apart and MADs of about 4 have no overlap. Is the claim supported? Explain.

ANSWER _____

APPLY IT Show your work

1 Orbit and Pixel game clubs recorded points from four practice rounds. Use the table. Find each mean and MAD. Then express the difference between the means as a multiple of MAD and describe the overlap.

PRACTICE-ROUND POINTS

Round	Orbit	Pixel
1	5	9
2	7	11
3	9	13
4	11	15

ANSWER _____

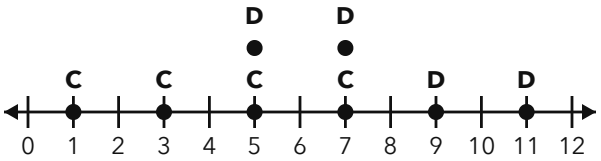
2 Two groups track minutes spent practicing a new dance. Group A has a mean of 18 minutes and a MAD of 3 minutes. Group B has a mean of 24 minutes and a MAD of 3 minutes. How many MADs apart are the centers? What does this suggest about overlap?

WORK SPACE

ANSWER _____

CHALLENGE One step up

The number line shows values for groups C and D. Both groups have a MAD of 2. A student says, "The groups have no overlap because their centers are 2 MADs apart." Is the student correct? Use the plot and calculations to explain.



WORK SPACE AND ANSWER

ANSWER KEY # Center Gap Detective

GRADE 7 · 7.SP.B.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Two groups have means of 18 and 24. Their MADs are both 3. How many MADs apart are the means?	**2 MADs apart**
2	Two distributions have means of 50 and 52. Both MADs are 4. Find the center difference as a multiple of MAD. Would you expect much overlap?	**1/2 MAD; yes, much overlap is expected.**
3	The means are 14 and 23, and both MADs are 3. How many MADs apart are the centers? Describe the likely overlap.	**3 MADs apart; little overlap is likely.**
4	A student says that two distributions with means 8 apart and MADs of about 4 have no overlap. Is the claim supported? Explain.	**No. The centers are 2 MADs apart, so some overlap may still occur.**

PART 2 · APPLY IT

1. **Orbit: mean 8, MAD 2. Pixel: mean 12, MAD 2. The centers are 2 MADs apart, and the groups overlap at 9 and 11.** The means differ by 12 - 8 = 4. Since 4 / 2 = 2, the centers are 2 MADs apart.
2. **2 MADs apart; the groups should show noticeable separation, with possible overlap.** The center difference is 24 - 18 = 6 minutes. Divide by the MAD: 6 / 3 = 2.

CHALLENGE

No. The mean of C is 4 and the mean of D is 8, so the centers are 4 / 2 = 2 MADs apart. However, both groups have values of 5 and 7, so they do overlap.

Accept equivalent wording for likely overlap, such as noticeable separation with some overlap, when the center gap is 2 MADs. For the challenge, students must identify both shared values or clearly state that the groups share values.