LESSON MAKER PRO

Data Detective

Find the center and spread of a sample.

GRADE 6 · MT.6.SP.5

MT.6.SP.5 "Characterize numerical data sets from a sample in relation to their context, such as by: Reporting the number of observations, Describing the nature of the attribute under investigation..."

NAME _____ DATE _____

CENTER AND SPREAD

Order the values: the median is the middle value, and the mean is the total divided by the number of values. To find the interquartile range (IQR), subtract the median of the lower half (Q1) from the median of the upper half (Q3); leave out the middle value when splitting an odd-sized set. The mean absolute deviation (MAD) is the average distance from the mean; a value far from the rest can make the median and IQR a better choice.

WORKED EXAMPLE

Find the median and IQR of the stretching times shown.

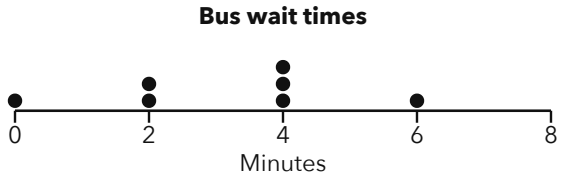


1. Read the 7 times in order: 3, 5, 7, 9, 11, 13, 15.
2. The middle time is 9 minutes, so the median is 9 minutes.
3. Leave out 9. The lower half has a median of 5, and the upper half has a median of 13.
4. IQR = 13 - 5 = 8 minutes.

Answer: Median: 9 minutes; IQR: 8 minutes.

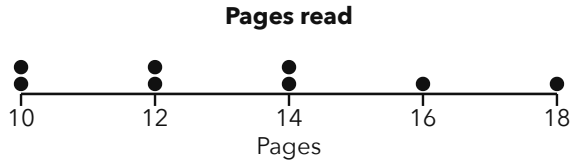
PRACTICE 6 problems

1 The dot plot shows bus wait times for a sample of students. What is the median wait time?



ANSWER _____

2 The dot plot shows how many pages a sample of students read in one sitting. Find the median and IQR.



ANSWER _____

3 A sample of six students completed 20, 22, 24, 26, 28, and 30 jumping jacks in one minute. Find the IQR.

ANSWER _____

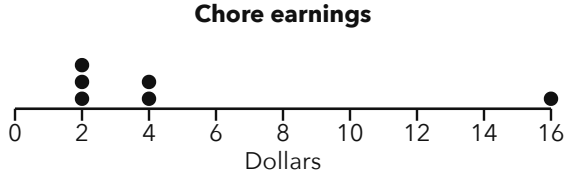
4 Eight students spent 4, 6, 6, 8, 10, 12, 12, and 14 minutes warming up. Find the median and IQR.

ANSWER _____

5 Five game rounds lasted 2, 2, 4, 6, and 16 minutes. Find the mean and median round lengths.

ANSWER _____

6 The dot plot shows money earned from chores by a sample of students. Which better describes the usual amount and spread: the mean and MAD, or the median and IQR? Give the median and IQR, and explain your choice.



ANSWER _____

APPLY IT Show your work

1 During a gaming club challenge, a sample of eight players scored 4, 6, 6, 8, 10, 12, 14, and 16 points in one round. How many observations are there? What was measured, and in what units? Find the median and IQR.

WORK SPACE

ANSWER _____

2 Six friends timed how long they practiced a new dance move: 12, 14, 16, 18, 20, and 22 minutes. Find the mean and MAD. Is the mean a reasonable way to describe a typical practice time? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

The dot plot shows practice times for six students. One student corrects the 8-minute time to 26 minutes. Find the mean, median, and IQR before and after the correction. Which measures changed?

Practice times before correction



WORK SPACE AND ANSWER

Data Detective

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The dot plot shows bus wait times for a sample of students. What is the median wait time?	**4 minutes**
2	The dot plot shows how many pages a sample of students read in one sitting. Find the median and IQR.	**Median: 13 pages; IQR: 4 pages.**
3	A sample of six students completed 20, 22, 24, 26, 28, and 30 jumping jacks in one minute. Find the IQR.	**6 jumping jacks**
4	Eight students spent 4, 6, 6, 8, 10, 12, 12, and 14 minutes warming up. Find the median and IQR.	**Median: 9 minutes; IQR: 6 minutes.**
5	Five game rounds lasted 2, 2, 4, 6, and 16 minutes. Find the mean and median round lengths.	**Mean: 6 minutes; median: 4 minutes.**
6	The dot plot shows money earned from chores by a sample of students. Which better describes the usual amount and spread: the mean and MAD, or the median and IQR? Give the median and IQR, and explain your choice.	**Median: $3; IQR: $2. The median and IQR are better choices because $16 is far above the other amounts.**

PART 2 · APPLY IT

1. **8 observations; points scored by each player in one round, measured in points; median: 9 points; IQR: 7 points.** The middle scores are 8 and 10, so the median is 9. Q1 is 6 and Q3 is 13, so the IQR is 13 - 6 = 7 points.
2. **Mean: 17 minutes; MAD: 3 minutes. Yes, the times are balanced around 17 minutes, with no value far from the rest.** The times total 102 minutes, so the mean is 102 / 6 = 17 minutes. Their distances from 17 are 5, 3, 1, 1, 3, and 5 minutes; the average distance is 18 / 6 = 3 minutes.

CHALLENGE

Before: mean 5 minutes, median 5 minutes, IQR 2 minutes. After: mean 8 minutes, median 5 minutes, IQR 2 minutes. Only the mean changed.

Accept equivalent explanations that identify the unusually high chore earning or the balanced dance practice times. Mean, median, IQR, and MAD should be reported in the units of the data.