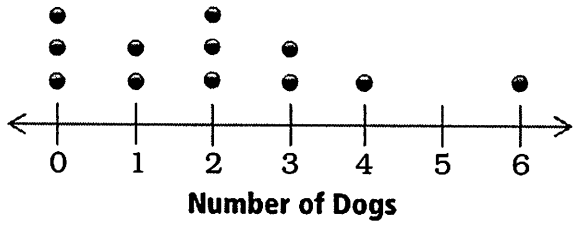
Mean Absolute Deviation

The **mean** represents a center of the data set. The mean can be used as a reference point to measure how much each data value in the data set **deviates**, or strays, from it.

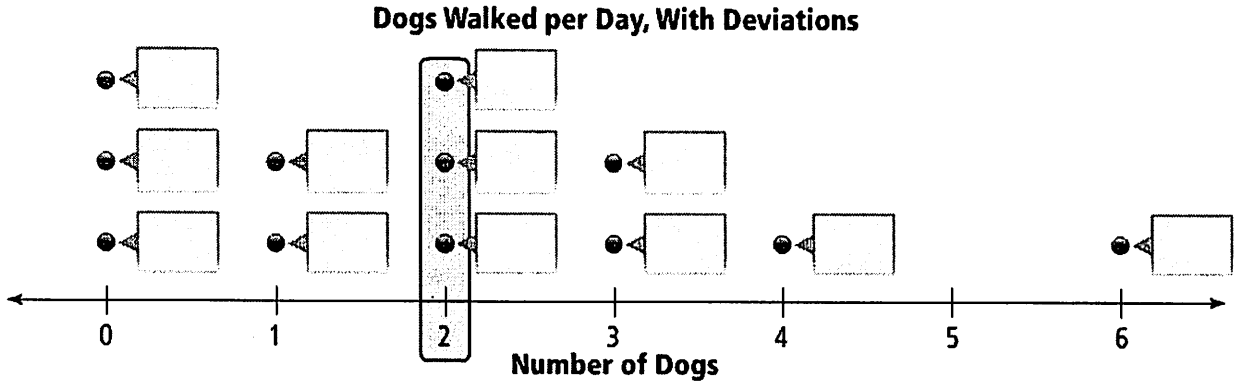
The **deviation of a data value from the mean** measures how far and in which direction the data value is from the mean. Data values that are less than the mean have a negative deviation. Data values that are greater than the mean have a positive deviation.

Example

You are starting a dog-walking business. The dot plot shows how many dogs you walked per day for 12 days. Find the mean of the data.

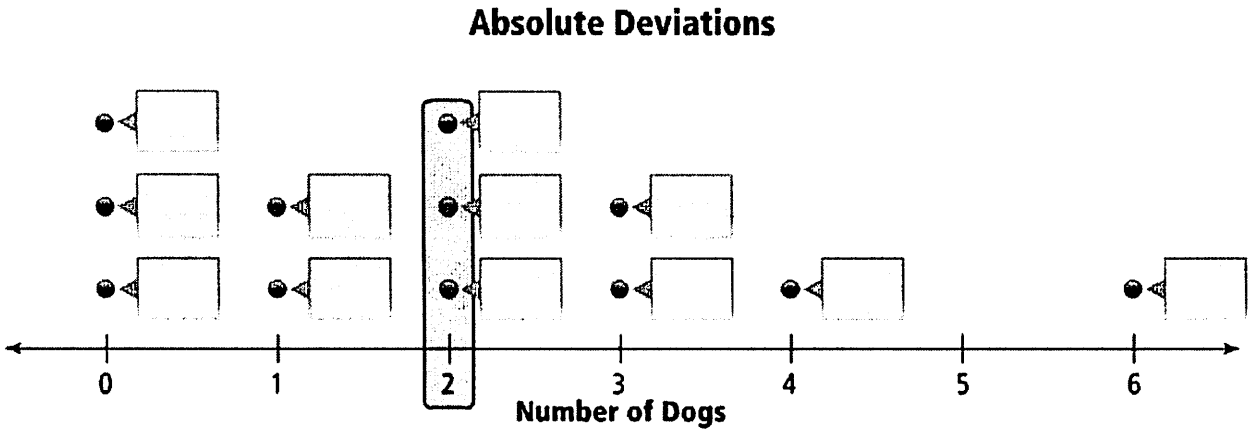


Deviations



Absolute Deviations

The **absolute deviation of a data value from the mean** is the distance that the data value is away from the mean. Because it is a distance, absolute deviation cannot be negative. You find it by taking the absolute value of the deviation of the data.



Mean Absolute Deviation

The **mean absolute deviation** is a measure of variability that describes how much the data values are spread out from the mean of a data set. The mean absolute deviation is the average distance that the data values are spread around the mean.

The greater the mean absolute deviation, the higher the variability in the data set.

Find the Mean Absolute Deviation (MAD) for the number of dogs and explain how it describes the variability of the data set.

1. Find the mean absolute deviation.

12, 5, 2, 25, 36, 6, 19

Data	Mean	Deviation	Absolute Deviation
		Sum:	
		Count:	
		Mean Absolute Deviation:	

2. Find the mean absolute deviation.

124, 128, 130, 121, 127, 122

Data	Mean	Deviation	Absolute Deviation
		Sum:	
		Count:	
		Mean Absolute Deviation:	

Mean Absolute Deviation

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Example

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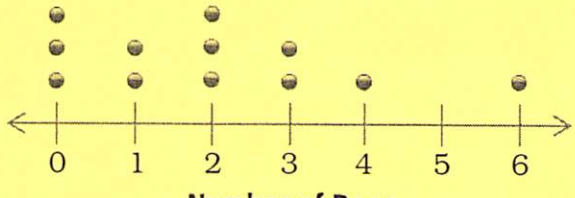


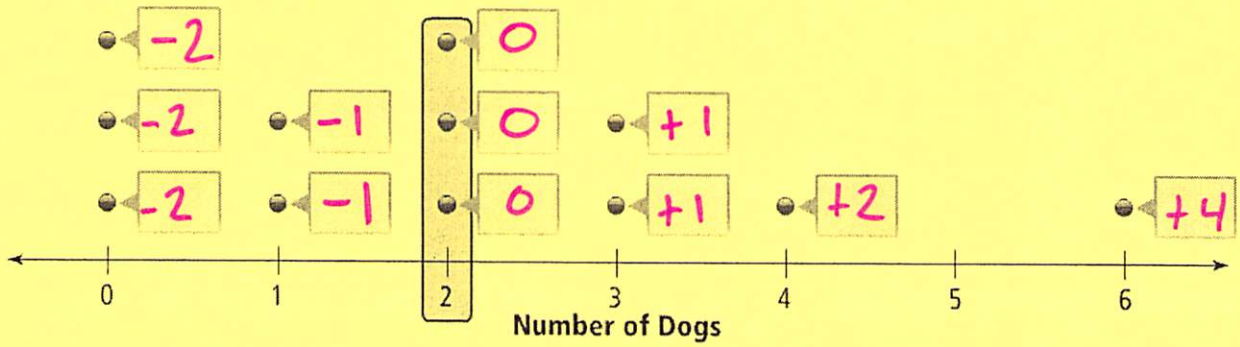
0, 0, 0, 1, 1, 2, 2, 2, 3, 3, 4, 6

24 ÷ 12

mean = 2

Deviations

Dogs Walked per Day, With Deviations



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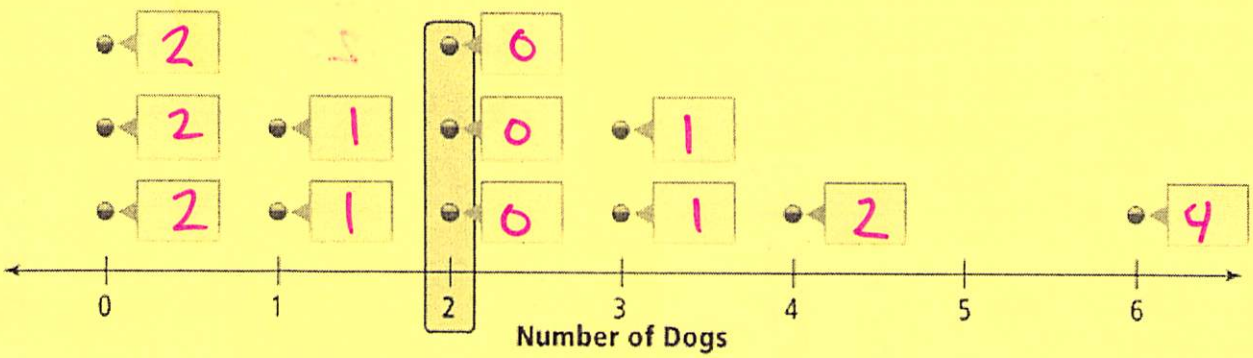
* *

Absolute Deviations



Mean Absolute Deviation

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The greater the mean absolute deviation, the higher the variability in the data set.

Find the Mean Absolute Deviation (MAD) for the number of dogs and explain how it describes the variability of the data set.

2, 2, 2, 1, 1, 0, 0, 0, 1, 1, 2, 4

16 ÷ 12 = MAD 1.33̄

1. Find the mean absolute deviation.

12, 5, 2, 25, 36, 6, 19

Data	Mean	Deviation	Absolute Deviation
2	15	-13	13
5	15	-10	10
6	15	-9	9
12	15	-3	3
19	15	4	4
25	15	10	10
36	15	21	21
		Sum:	70
		Count:	7
		Mean Absolute Deviation:	10

2. Find the mean absolute deviation.

124, 128, 130, 121, 127, 122

Data	Mean	Deviation	Absolute Deviation
121	125	-4	4
122	125	-3	3
124	125	-1	1
127	125	2	2
128	125	3	3
130	125	5	5
		Sum:	18
		Count:	6
		Mean Absolute Deviation:	3