

**Vocabulary**

Measures of Variation - used to describe the distribution, or spread, of the data. They describe how the values of a data set vary with a single number.

Can you list words that start with *quar*?

quarter quart quartile

Quartiles are values that divide a set of data into 4 equal parts.

First Quartile (Q<sub>1</sub>) - It is the median of the lower half.

Third Quartile (Q<sub>3</sub>) - It is the median of the upper.

Interquartile Range (IQR) - the distance between the first and third quartiles of the data set.

Range - The difference between the greatest and least data values.

Outlier - a data value that is either much greater or much less than the median.

**Guided practice:**

The average wind speeds for several cities in Pennsylvania are given in the table.

Wind Speed	
Pennsylvania City	Speed (mph)
Allentown	<del>8.9</del>
Erie	<del>11.0</del>
Harrisburg	<del>7.5</del>
Middletown	<del>7.7</del>
Philadelphia	<del>9.5</del>
Pittsburgh	<del>9.0</del>
Williamsport	<del>7.6</del>

a. Find the range of the data.

big - small

$$11.0 - 7.5 = 3.5$$

b. Find the median and the first and third quartiles.

median - 8.9

Q<sub>1</sub> - 7.6

Q<sub>3</sub> - 9.5

c. Find the interquartile range.

$$9.5 - 7.6 = 1.9$$

d. Identify any outliers in the data.

none

7.5, 7.6, ~~7.7~~, 8.9, ~~9.0~~, ~~9.5~~, 11.0

The height of several types of palm trees, in feet, are ~~40~~, ~~25~~, ~~15~~, ~~22~~, ~~50~~, and ~~30~~. The height of several types of pine trees, in feet, are ~~60~~, ~~75~~, ~~45~~, ~~80~~, ~~75~~, and ~~70~~. Compare and contrast the measures of variation of both kinds of trees.

Palm Tree	Pine Tree
<del>15</del> , <del>22</del> , <del>25</del>   <del>30</del> , <del>40</del> , <del>50</del>	<del>45</del> , <del>60</del> , <del>70</del>   <del>75</del> , <del>75</del> , <del>80</del>
Range: $50 - 15 = 35$	Range: $80 - 45 = 35$
Median: $27.5$	Median: $72.5$
Q <sub>1</sub> : $22$	Q <sub>1</sub> : $60$
Q <sub>3</sub> : $40$	Q <sub>3</sub> : $75$
IQR: $40 - 22 = 18$	IQR: $75 - 60 = 15$

### Partner Talk

What is the range, 1<sup>st</sup> quartile, 3<sup>rd</sup> Quartile, and IQR of the following data: ~~15~~, ~~18~~, ~~19~~, ~~11~~, and ~~20~~.

~~11~~, ~~15~~, ~~18~~, ~~19~~, ~~20~~

range =  $20 - 11 = 9$

median = 18

Q<sub>1</sub> = 13

Q<sub>3</sub> = 19.5

IQR = 6.5

**Building on the Essential Question** – Describe the difference between measures of center and measures of variation.

describe center of data

describe spread of data

### Rate Yourself

Are you ready to move on? Shade the section that applies.

YES ? NO