

Lesson 11-5

Example 1 Find Measures of Variation
FOOD Find the measures of variation for the data in the table.

Calories in a 1-cup Serving of Fruit	
Fruit	Calories
Apples	73
Blueberries	81
Cherries	84
Grapefruit	69
Grapes	113
Mandarin Oranges	84
Plums	90
Strawberries	45

The range is $113 - 45$ or 68 Calories.

Median, Upper Quartile, and Lower Quartile

Arrange the numbers in order from least to greatest.

lower quartile	median	upper quartile
↓	↓	↓
45 <u>69</u> 73	<u>81</u> <u>84</u>	84 <u>90</u> 113
69	$\frac{81 + 84}{2} = 82.5$	90

The median is 82.5, the lower quartile is 69, and the upper quartile is 90.

Interquartile Range = upper quartile – lower quartile = $90 - 69$ or 21

Example 2 Find Outliers
CAR SALES Find any outliers for the data in the table.

Annual Car Sales	
Country	Cars Sold (in thousands)
Belgium	515
Austria	310
Greece	290
Sweden	290
Portugal	258
Ireland	237
Luxembourg	42

upper quartile →

median →

lower quartile →

Find the interquartile range.

$$310 - 237 = 73$$

Multiply the interquartile range by 1.5.

$$73 \times 1.5 = 109.5$$

Find the limits for the outliers.

Subtract 109.5 from the lower quartile.

$$237 - 109.5 = 127.5$$

Add 109.5 to the upper quartile.

$$310 + 109.5 = 419.5$$

The limits for the outliers are 127.5 and 419.5. The two outliers are 515 and 42.

Example 3 Use Measures of Variation to Describe Data

VOLUNTEER Use the measures of variation to describe the data in the table at the right.

Volunteer Hours	
Student	Hours
Geraldo	26
Michael	22
Anne	20
Betty	18
Ralph	15
Erin	12
Amanda	7

Find the measures of variation.

The range is $26 - 7$, or 19.

The median is 18.

The upper quartile is 21.

The lower quartile is 13.5.

The interquartile range is $21 - 13.5$, or 7.5.

The spread of the data is 19 hours. The middle number is 18 hours. One-fourth of the students volunteered 13.5 or fewer hours, and one-fourth of the students volunteered 21 or more hours. The number of hours volunteered by half of the students was in the interval 13.5–21.