35.20

At The Bell: **PSSA:** pg. 700 #6

6. **Persevere with Problems** The two-way table shows the amount of time students studied for a test and the score they received. What is the relative frequency by column of the students that studied more than 30 minutes and received a score of 75% or more? (Lesson 3)

	Less than 30 minutes	More than 30 minutes
Score of 75% or more	20	45
Score below 75%	33	27

6. **Persevere with Problems** The two-way table shows the amount of time students studied for a test and the score they received. What is the relative frequency by column of the students that studied more than 30 minutes and received a score of 75% or more? (Lesson 3)

0.63

	Less than 30 minutes	More than 30 minutes
Score of 75% or more	20	45
Score below 75%	33	27

35.20

At The Bell: **PSSA:** Get out your packet from yesterday.

NAME _____ DATE _____ PERIOD _____

Lesson 3 Problem-Solving Practice

Two-Way Tables

Solve.

1. Ricardo surveyed 110 eighth grade students to find out if they have a parttime job. There are 60 students who have a part-time job, including 48 honor roll students. Half of the students who do not have a job are on the Honor Roll. Construct a two-way table summarizing the data.

	On Honor Roll	Not on Honor Roll	Total
Job	48	12	60
No Job	25	25	50
Total	73	37	110

Customers entering a store were asked what electronic technology they own. The results of the survey are shown at the right. For Exercises 2 and 3, round relative frequencies to the nearest hundredth if necessary.

	E-Reader	No E-Reader	Total
Laptop	20	8	28
No Laptop	45	22	67
Total	65	30	95

2. Find and interpret the relative frequencies by row.

$\frac{20}{28} \approx 0.71, \frac{8}{28} \approx 0.29, \frac{28}{28} = 1.00;$
$\frac{45}{67} \approx 0.67; \frac{22}{67} \approx 0.33, \frac{67}{67} = 1.00;$
Sample answer: Over two-thirds of the customers who own laptops also own E-readers. Almost two thirds of the customers who do not own laptops own E-readers.

3. Find and interpret the relative frequencies by column.

$\frac{20}{65} \approx 0.31, \frac{45}{65} \approx 0.69, \frac{65}{65} = 1.00;$
$\frac{8}{30} \approx 0.27, \frac{22}{30} \approx 0.73, \frac{30}{30} = 1.00;$
Sample answer: Less than one third of the customers who own E-readers own laptops. Over two thirds of the customers who do not own E-readers do not own laptops.

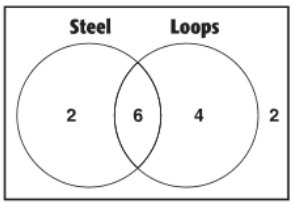
NAME _____ DATE _____ PERIOD _____

Lesson 3 Homework Practice

Two-Way Tables

For Exercises 1-6, use the Venn diagram at the right and the information below.

The Venn diagram compares the roller coasters at an amusement park as to whether or not they are made of steel and whether or not they have loops.



1. Complete the two-way table below.

	Steel	Not Steel	Total
Loops	6	4	10
No Loops	2	2	4
Total	8	6	14

2. How many roller coasters are at the amusement park? **14**

3. Find the relative frequencies from the table in Exercise 1 by row.

	Steel	Not Steel	Total
Loops	$\frac{6}{10} = 0.60$	$\frac{4}{10} = 0.40$	$\frac{10}{10} = 1.00$
No Loops	$\frac{2}{4} = 0.50$	$\frac{2}{4} = 0.50$	$\frac{4}{4} = 1.00$

4. Interpret the relative frequencies you found in Exercise 3.

Sample answer: Over half of the roller coasters with loops are made of steel. Half of the roller coasters without loops are made of steel.

5. Find the relative frequencies from the table in Exercise 1 by column. Round to the nearest hundredth if necessary.

	Steel	Not Steel
Loops	$\frac{6}{8} = 0.75$	$\frac{4}{6} \approx 0.67$
No Loops	$\frac{2}{8} = 0.25$	$\frac{2}{6} \approx 0.33$
Total	$\frac{8}{8} = 1.00$	$\frac{6}{6} = 1.00$

6. Interpret the relative frequencies you found in Exercise 5.

Sample answer: Three fourths of the steel roller coasters have loops, and two thirds of the roller coasters not made of steel have loops.

Statistics and Probability

Lesson 4

Descriptive Statistics

Measures of Center and Variability

Data with one variable, such as test scores, are called **univariate data**. These data can be described by a measure of center.

Example

pg. 702

1. **The ages, in years, of the people seated in one row of a movie theater are 16, 15, 24, 33, 30, 56, 19, and 19. Find the mean, median, mode, and range of the data set.**

Mean $\frac{16 + 15 + 24 + 33 + 30 + 56 + 19 + 19}{8} = \frac{212}{8}$ or 26.5

Median 15, 16, 19, 19, 24, 30, 33, 56 — Arrange in order from least to greatest.

$\frac{19 + 24}{2} = 21.5$ years old

Mode The mode is 19, since it is the number that occurs most often.

Range $56 - 15 = 41$

Essential Question

HOW are patterns used when comparing two quantities?

Vocabulary

univariate data
quantitative data
five-number summary

Common Core State Standards

Content Standards
Preparation for S.ID.1 and S.ID.2
Mathematical Practices
1, 2, 3, 4, 7

Got it? Do this problem to find out.

a. Find the mean, median, mode, and range of the data set.

Heights of Students (in.)				
66	72	70	74	64
65	60	62	66	67
68	71	70	72	73

Range: $74 - 60 = 14$

60 62 64 65 66 66 67 68 70 70 71 72 72 73 74

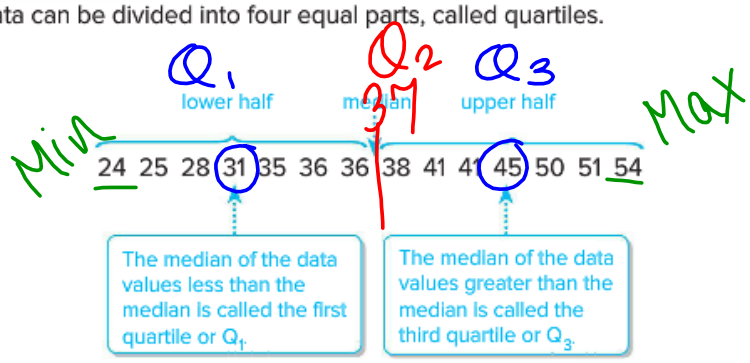
Median

Mean: $\frac{1020}{15} = 68$

Mode: 66, 70, 72

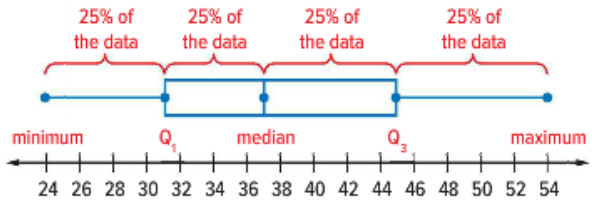
Five-Number Summary

Quantitative data are data that can be measured. A set of quantitative data can be divided into four equal parts, called quartiles.



pg. 703

This **five-number summary**, which includes the minimum value, first quartile (Q_1), median, third quartile (Q_3), and the maximum value of a data set, provides a numerical way of characterizing a set of data. The five-number summary can be described visually with a box plot, as shown below.



Interquartile Range
$Q_3 - Q_1$

Example

Tutor

2. **The data for daily average temperatures for 15 days in May are shown in the table.**

Temperature (°F)				
68	73	70	71	74
72	75	69	76	75
72	75	76	75	76

a. Find the five-number summary of the data.

Write the data from least to greatest.

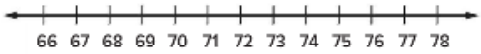
68 69 70 71 72 72 73 74 75 75 75 75 76 76 76

Q_1 Q_2 Q_3

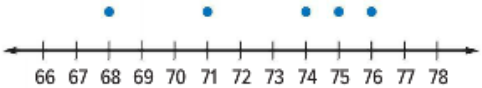
minimum: 68 — first quartile: 71 — median: 74 — third quartile: 75 — maximum: 76

b. Draw a box plot of the data.

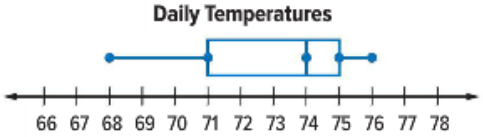
Step 1 Draw a number line that includes the least and greatest numbers in the data.



Step 2 Mark the minimum and maximum values, the median, and the first and third quartiles above the number line.



Step 3 Draw the box plot and assign a title to the graph.



Got it? Do these problems to find out. pg. 704

b. The points scored by a basketball team are shown in the table. Find the five-number summary of the data.

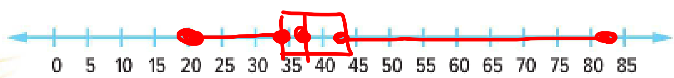
Game	1	2	3	4	5	6	7	8	9
Number of Points	34	20	83	38	37	44	40	35	36

Min → 20, 34, 35, 36 | 36 | 37, 40, 44, 83 ← Max

34.5 Q1 Q2 42 Q3

c. Draw a box plot of the data.

Points Scored



Guided Practice

1. The points scored by each of seven basketball players is 12, 4, 18, 16, 21, 8, and 12. Find the mean, median, mode, and range of the data set. (Example 1)

4, 8, 12, (12), 16, 18, 21 — Median

Mode: 12

Mean: $\frac{91}{7} = 13$

Range: $21 - 4 = 17$

2. The data for Calories burned per minute of exercise is in the table. (Example 2)

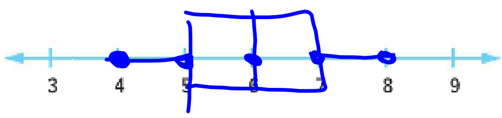
Exercise	Jogging	Jumping Rope	Basketball	Soccer	Bicycling	Downhill Skiing	Walking
Calories Burned	8	7	7	6	5	5	4

Min 4 | 5 | 5 | 6 | 7 | 7 | 8 Max (Q1, Q2, Q3)

a. Find the five-number summary of the data.

b. Draw a box plot to represent the data.

Calories Burned



Assignment:

pg. 705 ALL
pg. 706 (5)