

**Unit #9: Data Analysis****Resources:** Big Ideas Chapters 10**Common Core Standards:** 6.SP.2; 6.SP.4; 6.SP.5c

Number	Learning Targets	Common Core Standard	Resources
1	I can make and analyze a stem and leaf plot.	6.SP.2, 6.SP.4	10.1
2	I can make and analyze a histogram.	6.SP.2, 6.SP.4	10.2
3	I can describe shapes of distributions.	6.SP.2, 6.SP.4	10.3
4	I can make and interpret box-and-whisker plots.	6.SP.2, 6.SP.4, 6.SP.5c	10.4



## 10.1 Stem-and-Leaf Student Notes

### Vocabulary:

**Stem-and-Leaf:** Uses the digits of data values to organize a data set.

It shows how data are distributed.

**Stem:** digit or digits on the left

digit or digits on the right

Stem	Leaf
2	0 0 1 2 5 7
3	1 4 8
4	2
5	8 9

Key: 2|0 = 20

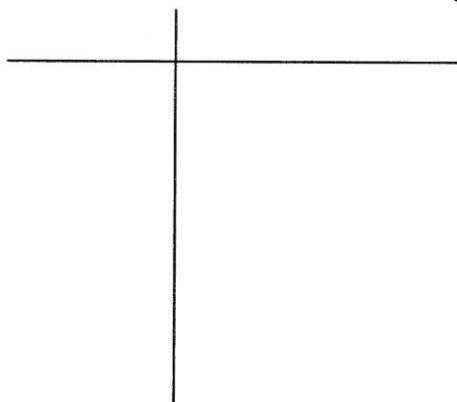
The key explains what the stems and leaves represent.

**Example 1:** Make a stem-and-leaf plot of the length of the 12 cell phone calls.

a.) Order the data:

b.) Write the stems on the left of the vertical line

c.) Write the leaves for each stem to the right of the vertical line.



	A	B
1	DATE	MINUTES
2	JULY 9	55
3	JULY 9	3
4	JULY 9	6
5	JULY 10	14
6	JULY 10	18
7	JULY 10	5
8	JULY 10	23
9	JULY 11	30
10	JULY 11	23
11	JULY 11	10
12	JULY 11	2
13	JULY 11	36

**Example 2:** The stem-and-leaf plot shows student scores.

a.) How many students scored less than 80 points?

b.) How many students scored at least 90 points?

c.) How are the data distributed?

Test Scores

Stem	Leaf
6	6
7	0 5 7 8
8	1 1 3 4 4 6 8 8 9
9	0 2 9
10	0

Key: 9|2 = 92 points

**Example 3:** Which statement is not true?

a.) Most of the plants are less than 20 inches tall.

b.) The median plant height is 11 inches.

c.) The range of the plant heights is 35 inches.

d.) The plant height that occurs most often is 11 inches.

Plant Heights

Stem	Leaf
0	1 2 4 5 6 8 9
1	0 1 1 5 7
2	2 5
3	6

Key: 1|5 = 15 inches

# 10.1 Stem-and-Leaf Plots Homework Day 1

Use the stem-and-leaf plot at the right.

1. How many data values are in the set?

2. What is the least value? greatest value?

Least = \_\_\_\_\_ Greatest = \_\_\_\_\_

3. What is the median? range?

Median = \_\_\_\_\_ Range = \_\_\_\_\_

4. What is the mode?

5. How many data values are less than 14?

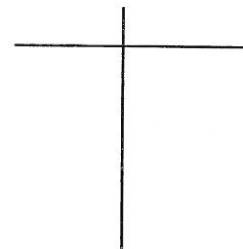
6. How many data values are more than 27?

Stem	Leaf
0	1 3 4 6
1	0 4
2	5 7
3	1 1 9
4	1 5

Key: 1 | 0 = 10

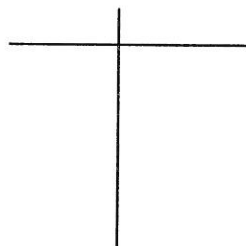
7. Make a stem-and-leaf plot of the data.

Pages Printed					
24	32	47	12	31	9
7	10	26	28	20	40



8. The tables show the numbers of lawns mowed by you each month for a year.

a. Make a stem-and-leaf plot for the lawns mowed by you.



Lawns Mowed by You					
5	12	7	10	25	30
12	8	21	17	20	4

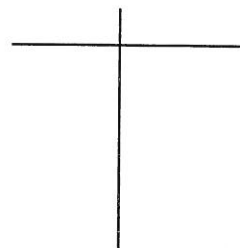
b. Analyze the stem-and-leaf plot from part (a) and make a conclusion about the number of lawns you mowed each month.

# 10.1 Stem-and-Leaf Plots Homework Day #2

Make a stem-and-leaf plot of the data.

1.

Emails Sent			
55	12	37	42
35	56	9	16
38	31	12	45



The stem-and-leaf plot shows the weights (in pounds) of 15 pumpkins.

2. How many pumpkins weigh more than 10 pounds?
3. Find the mean, median, mode, and range of the data.

Stem	Leaf
0	6 8
1	2 6 8 8
2	0 1 3 6 9
3	2 4 8
4	
5	9

4. How many pumpkins weigh more than the mean?

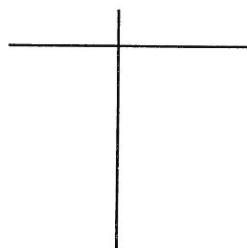
Key: 2 | 1 = 21 pounds

5. Describe the distribution of the data.

6. Which data value is the outlier? Describe how the outlier affects the mean.

7. The table shows the number of kittens adopted from a Humane Society each month for a year.

- a. Make a stem-and-leaf plot of the data.



Kittens Adopted			
January	12	July	19
February	21	August	22
March	23	September	21
April	31	October	24
May	25	November	31
June	18	December	42

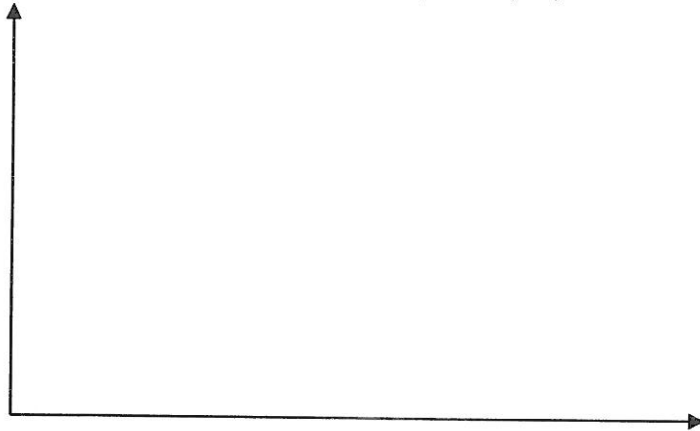
- b. During which month were the most kittens adopted? Make a conclusion about this.
- c. What row had the most data items? What percent of the data items are in the row?
- d. Find the mean and the mode of the data

## 10.2 Histogram

Vocabulary:

**Histogram:** A bar graph that shows the frequency of data values in intervals of the same size.

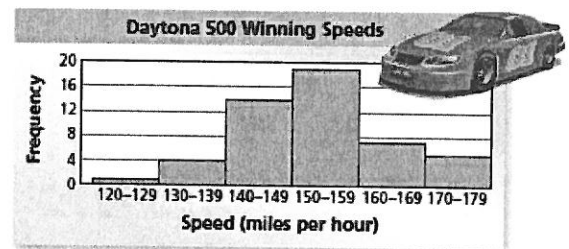
**Example 1:** The frequency table shows the numbers of laps that people in a swimming class completed today. Display the data in a histogram.



Number of Laps	Frequency
1-3	11
4-6	4
7-9	0
10-12	3
13-15	6

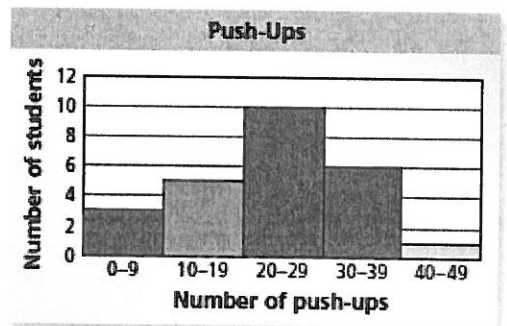
**Example 2:** The histogram shows the winning speeds at the Daytona 500.

- Which interval contains the most data values?
- How many of the winning speeds are less than 140 mph?
- How many of the winning speeds are at least 160 mph?



**Example 3:** Which statement cannot be made using the data display?

- Most students can do between 20-29 push-ups.
- Five students completed at least 10 and at most 19 push-ups.
- At least one student completed more than 39 push-ups.
- 15 students completed at least 20 and at most 39 push-ups.

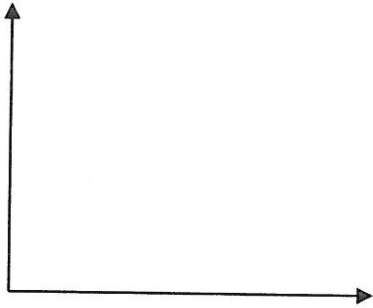


# 10.2 Histograms Homework Day #1

Display the data in a histogram.

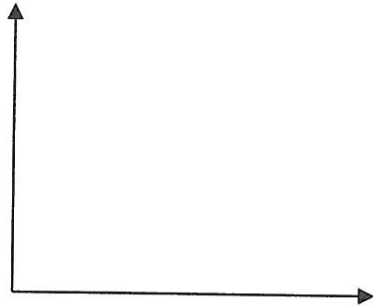
1.

Free Throws Made	
Free Throws	Frequency
0–2	9
3–5	6
6–8	2
9–11	1



2.

Magazines Sold	
Magazines	Frequency
0–5	3
6–11	9
12–17	8
18–23	2

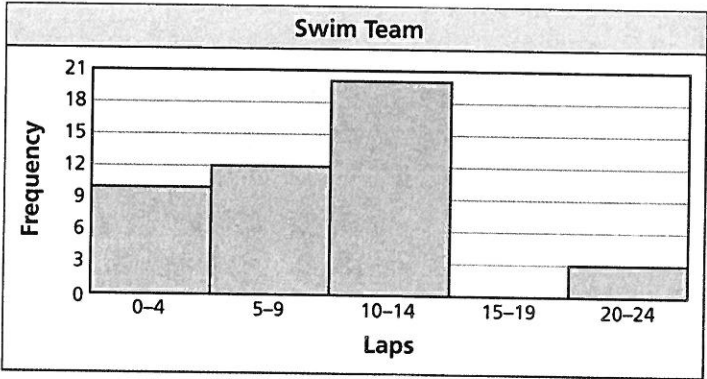


3. The histogram shows the number of laps completed by the swimmers on a team during a practice.

a. Which interval contains the most data values?

b. How many swimmers are on the team?

c. What percent of the swimmers swam more than 14 laps? Round to the nearest tenth of a percent.



d. How many swimmers swam 5 or more laps?

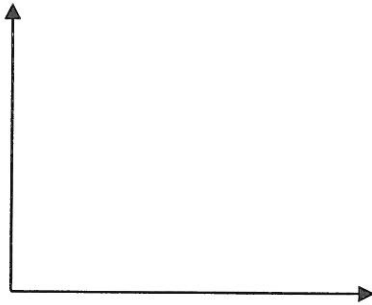
e. How many more swimmers swam between 10–14 laps than 20–24 laps?

# 10.2 Histograms Homework Day #2

Display the data in a histogram.

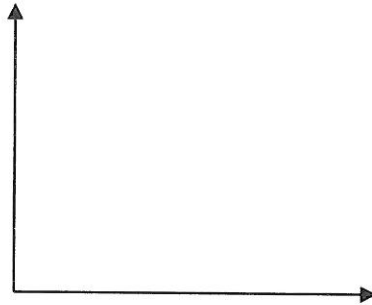
1.

Pages Typed	
Pages	Frequency
1–10	14
11–20	16
21–30	0
31–40	5



2.

Cookies Baked	
Cookies	Frequency
1–24	3
25–48	15
49–72	18
73–96	35

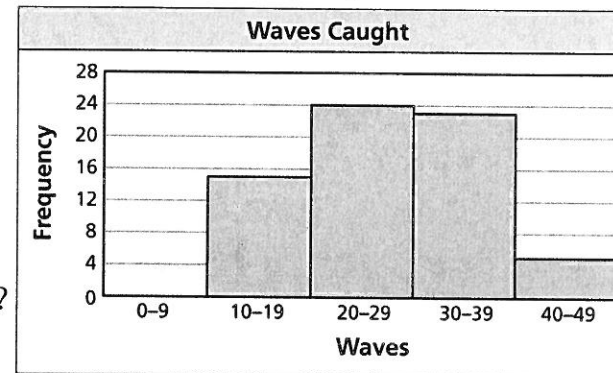


3. The histogram shows the number of waves caught by surfers at a beach one day.

a. Which interval contains the fewest data values?

b. How many surfers were at the beach?

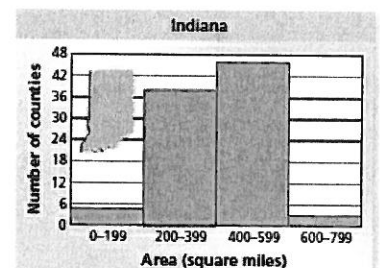
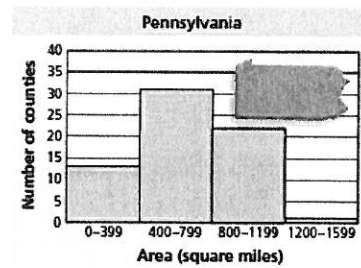
c. What interval contains about 22% of the surfers?



d. According to the histogram, is it possible that a surfer did not catch any waves that day? Explain

e. Would you conclude that this was a *good* or *bad* surfing day? Explain.

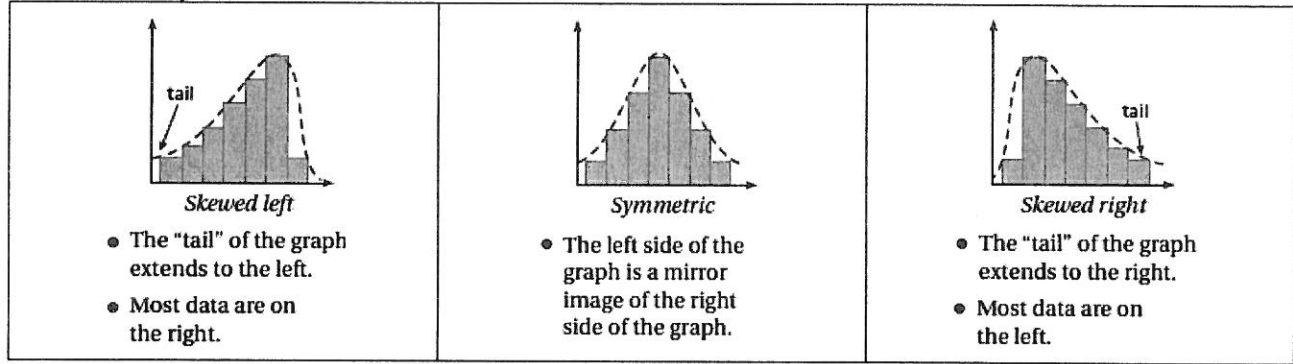
4. The histograms show the areas of counties in Pennsylvania and Indiana. Which state do you think has the greater area? Explain.





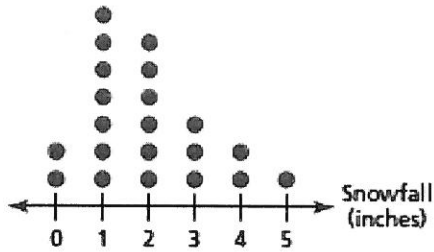
### 10.3 Shapes of Distribution

Vocabulary:

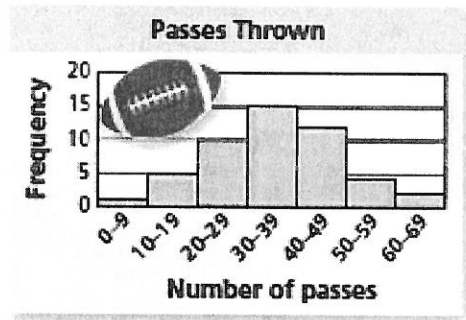


**Example 1: Describe the shape of each distribution.**

a.) **Daily Snowfall Amounts**



b.)



### Example 2:

a.) Make a dot plot of the following class size information:

26	29	27	29	28	29	30	28
28	30	30	25	29	27	28	29



**b.) Describe the shape of the distribution.**

# 10.3 Shapes of Distributions Homework Day #1

Make a dot plot of the data. Describe the shape of the distribution.

1.

Cups of Water Per Day									
8	6	9	6	8	8	8	10	7	8
7	9	8	10	7	9	5	8	11	8

2.

Pairs of Shoes Worn Per Day										
1	1	1	3	2	2	1	2	1	3	4
2	1	1	2	3	1	1	2	4	2	2

←—————→

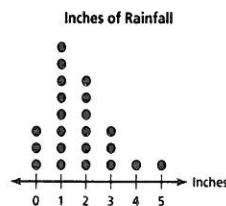
←—————→

Describe distribution:

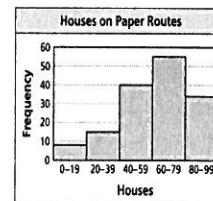
Describe distribution:

Describe the shape of each distribution.

3.



4.



5. The frequency table shows the ages of the members of two local fitness clubs.

Ages of Members	18–25	26–33	34–41	42–49	50–57	58–65
Frequency for Fitness Club A	14	19	13	8	6	3
Frequency for Fitness Club B	4	9	12	13	8	5

a. Look at the data in the chart. If you were to make a histogram, describe what you think the shape of each distribution would be.

Club A:

Club B:

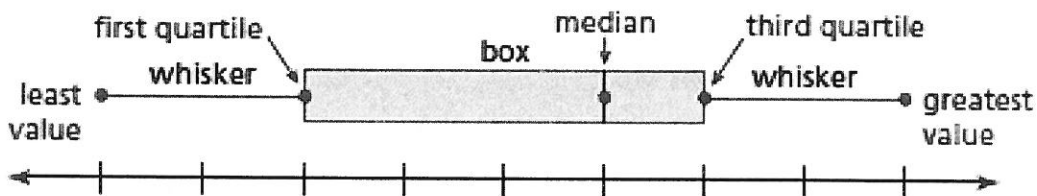
b. Which fitness club would appeal more to a young adult? Explain.



## 10.4 Box-and-Whisker Plots

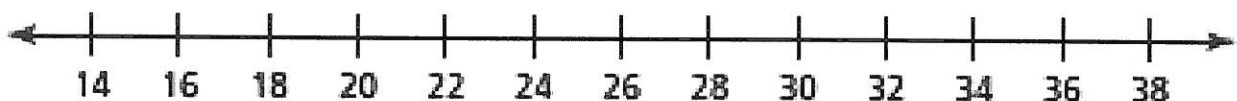
Vocabulary:

**Box-and-Whisker Plots:** Represents a data set along a number line by using the least value, greatest value, and the quartiles of the data.

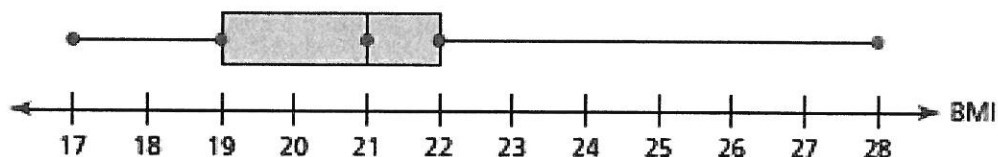


**Example 1:** Make a box-and-whisker plot for the ages (in years) of the spider monkeys at a zoo:

15	20	14	38	30	36	30	30	27	26	33	35
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**Example 2:** The box-and-whisker plot shows the body mass index (BMI) of a sixth grade class.



- What fraction of the students have a BMI of at least 22?
- Are the data more spread out below the first quartile or above the third quartile? Explain.
- Find and interpret the interquartile range of the data.

# 10.4 Box-and-Whisker Plots Homework Day #1

**Make a box-and-whisker plot for the data.**

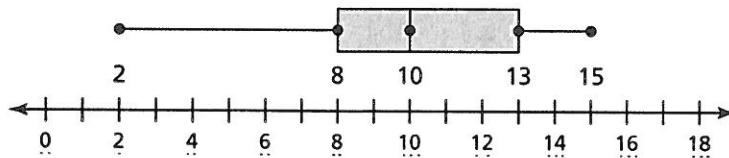
1. Miles per gallon: 18, 30, 24, 19, 22, 34, 13, 12, 20, 25, 28, 17



2. Numbers of take-out orders: 26, 2, 17, 25, 18, 20, 21, 15, 29, 27, 22



3. The box-and-whisker plot represents the numbers of cocoons in each butterfly tent.



- a. What percent of the butterfly tents contain at most 10 cocoons?
- b. Are the data more spread out below the first quartile or above the third quartile? Explain.
- c. Find and interpret the interquartile range of the data.
- d. What are the most appropriate measures to describe the center and variation of the distribution?

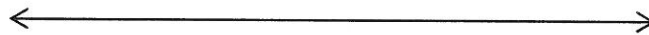
# 10.4 Box-and-Whisker Plots Homework Day #2

Make a box-and-whisker plot for the data.

1. Ages of buildings (in years): 12, 54, 30, 31, 48, 15, 20, 32, 1, 10, 13, 24

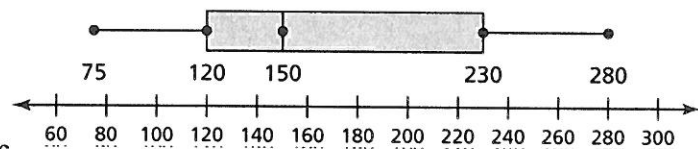


2. Selling prices of houses (in thousands of dollars): 40, 100, 82, 150, 124, 75, 54, 128, 112, 98, 76



3. The box-and-whisker plot represents the numbers of cars in airport parking lots.

- a. What percent of the airport parking lots contain at least 230 cars?

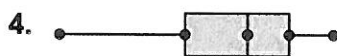


- b. Is there more variability in the numbers of cars below 120 or above 230? Explain.

- c. Find and interpret the range of the data.

- d. What are the most appropriate measures to describe the center and variation of the distribution?

Identify the shape of the distribution. Explain.



6. A double box-and-whisker plot represents the stock prices of Company A and Company B over a 30-day period. Both companies have a minimum price of \$3 and a maximum price of \$10. The median price for Company A is \$6 and the median price for Company B is \$9. Which company is more likely to have a symmetric box-and-whisker plot? Explain.

## Chapter 10 Homework Answers:

### 10.1 Homework Day 1:

1.) 13	2.) 1; 45	3.) median = 25; range = 44	4.) 31	5.) 5	6.) 5	7.) See below	8.) See below
8b.) I typically mow between 4 & 25 lawns a month							

7. Stem	Leaf
0	7 9
1	0 2
2	0 4 6 8
3	1 2
4	0 7

Key: 1 | 0 = 10 pages

8. a. Stem	Leaf
0	
1	9
2	7 8 9
3	0 1 2 2 5 5 8
4	0

Key: 1 | 9 = 19 lawns

### 10.1 Homework Day 2:

1.) See below	2.) 13 pumpkins	3.) 24; 21; 18; 53	4.) 6 pumpkins	5.) most weigh in the 10s, 20s, and 30s
6.) 59; increases the mean	7a.) See below	7b.) December	7c.) 20s row; 50%	d.) mean = 24.1; mode = 21 & 31

1. Stem	Leaf
0	9
1	2 2 6
2	
3	1 5 7 8
4	2 5
5	5 6

Key: 1 | 2 = 12 emails

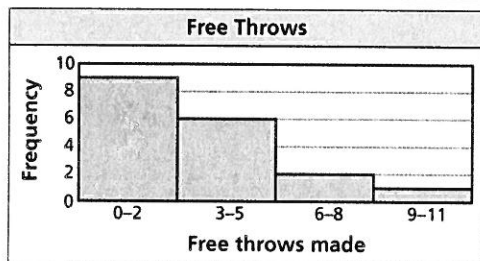
7 a. Stem	Leaf
1	2 8 9
2	1 1 2 3 4 5
3	1 1
4	2

Key: 3 | 1 = 31 kittens

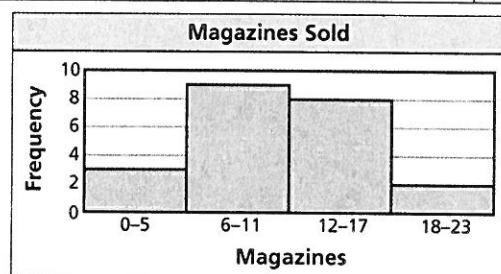
### 10.2 Homework Day 1:

1.) See below	2.) See below	3a.) 10 - 14	3b.) 45 swimmers	3c.) 6.7%	3d.) 35 swimmers	3e.) 17 swimmers
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1.)



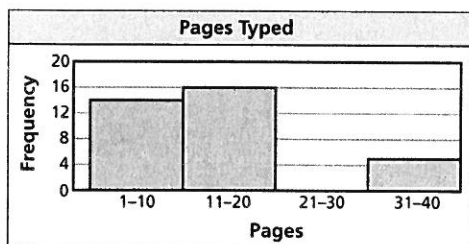
2.)



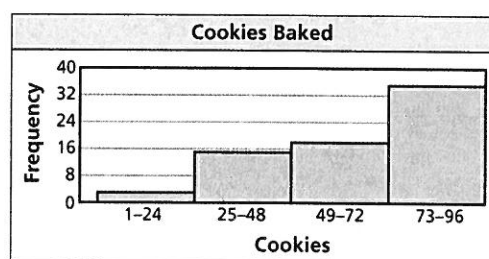
### 10.2 Homework Day 2:

1.) See below	2.) See below	3a.) 0-9	3b.) 67 surfers	3c.) 10-19	3d.) No; No data in the 0-9 interval
3e.) Good; Every surfer caught at least 10 waves, most caught between 20 and 39 waves		4.) Pennsylvania. You can see from the intervals and frequencies that Pennsylvania counties are greater in area which makes up for it having fewer counties.			

1.)

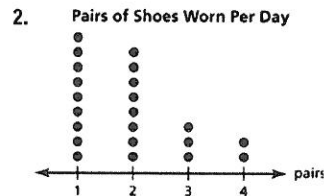
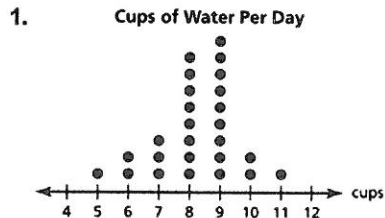


2.)



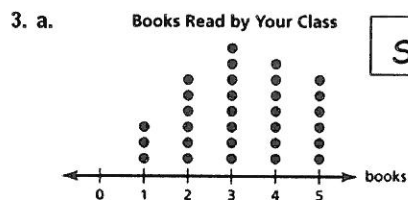
### 10.3 Homework Day 1:

1.) See below	2.) See below	3.) skewed right	4.) skewed left	5a.) Club A: Skewed right; it seems like there are a lot of younger ages listed. Club B: Symmetric; it seems like the middle section has the most people.
5b.) Fitness Club A: more younger members				

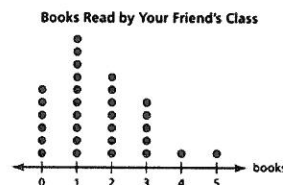


### 10.3 Homework Day 2:

1.) Symmetric	2.) Skewed Left	3a.) See below	3b.) Your class; There are more data values on the right
3c.) Your class; Both classes have 30 students & your class read more		3d.) Your class, less students in your class read the same number of books as other classmates.	
4.) No, distributions can have any shape.		5.) Yes; Since a stem-and-leaf graph lists out the numbers, you can see if the graph was skewed on symmetric based on the graph.	



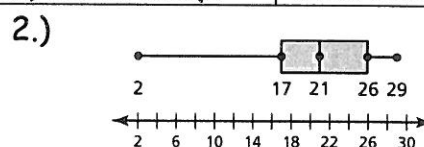
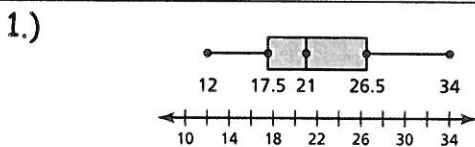
Skewed Left



Skewed Right

### 10.4 Homework Day 1:

1.) See below	2.) See below	3a.) 50%	3b.) Below the first quartile; Greater difference between the minimum and $Q_1$ .
3c.) IQR: 5; middle 50% of data has range of 5.		3d.) median & IQR	



### 10.4 Homework Day 1:

1.) See below	2.) See below	3a.) 25%	3b.) A little more variability above 230 (50 cars) vs. 45 cars below 120.	
3c.) range: 205; The numbers of cars in airport parking lots varies by at most 205 cars.			3d.) median and IQR	
4.) skewed left; The left whisker is longer than the right whisker.			5.) symmetric; The whiskers are about the same length, and the median is in the middle of the box.	
6.) Company A; The median is approximately in the middle of the minimum and maximum values.				

