

4/28/17 CCM6 and CCM6+

Make and analyze box-and-whisker plots.

1. Agenda...HW is page 35 # 6-7
2. Do Friday warm-ups **NO CALCULATOR**
3. Get out p.30-31 to check and get a calc.

①

$$\begin{array}{r}
 231 \\
 10.75 \\
 10.75 \\
 6.00 \\
 4.50 \\
 4.50 \\
 + 4.50 \\
 \hline
 \$ 41.00
 \end{array}$$

FRI WARM-UPS

②

$$\frac{1}{3} \cdot \frac{7}{34} \cdot \frac{17}{21} \cdot \frac{5}{9} = \frac{5}{18}$$

✓ p.30 finish for HW

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- b. Make a line plot showing a different possible arrangement for the numbers of people in the eight households. (Remember, the MEAN is 6.)



- c. Are the medians the same for the two arrangements you made?

5. The students in Mr. Wilson's study hall spent the following amounts of time on their HW.

$\frac{3}{4}$ hour $\frac{3}{4}$ hour $1\frac{1}{4}$ hours $\frac{3}{4}$ hour $\frac{3}{4}$ hour = $\frac{15}{4}$

What is the mean time his students spent on HW?

$$\frac{15}{4} \div 5 = \frac{3}{4} \cdot \frac{1}{5} = \frac{3}{4}$$

6. Use the data from question 5. What is the median time Mr. Wilson's students spent on HW?

- a) $\frac{1}{2}$ hour b) $\frac{3}{4}$ hour c) 1 hour d) $1\frac{1}{4}$ hours

$\frac{1}{2}, \frac{1}{2}, \frac{3}{4}, \frac{3}{4}, 1\frac{1}{4}$

7. Six students each had a different number of pens. They put them all together and then distributed them so that each student had the same number of pens.

- a. Choose any of the following that could be the number of pens they had altogether. Explain your reasoning.

A. 12 B. 18 C. 46 D. 48
 will $\div 6$ ✓ $\div 6$ ✓ $\div 6$ ✓

- b. Use your response from part a. How many pens did each person have after the pens were distributed evenly?

A. 2 B. 3 D. 8

- c. Your classmate says that finding the mean number of pens per person is the same as finding the number of pens each person had after the pens were distributed evenly. Do you agree or disagree? Explain.

yes - all same # is mean

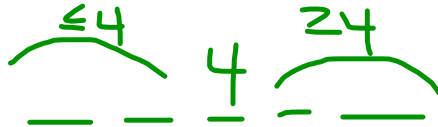
✓ p 31
HW

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~~Box Plots (Box-and-Whisker Plots)~~

WARMUP:

1. Create a set of data with 5 data values that have a median of 4.



2. Create another set of data with 5 data values that have a median of 4.

ex) 1, 2, 4, 4, 20

3. Do you use any "tricks" to help with these questions?

middle is 4!

4. Create a set of data with 6 data values that have a mean of 5.

total = 30



5. Create another set of data with 6 data values that have a mean of 5.

5, 6, 4, 8, 2, 5
 ✓ +1 -1 +3 -3 ✓

6. A trick in creating a set of data with the same mean is:

- use sum
 - Robin Hood

Box Plots (aka Box-and-Whisker Plots)

FIVE MAGIC NUMBERS

1. The minimum is the smallest data value.
This starts the first "whisker."
2. The lower quartile = Q1 is the middle of the lower half of the data.
25% of the data values are below this number and 75% are above.
This ends the first "whisker" and starts the "box."
3. The median = Q2 is the middle of all of the data.
50% of the data values are below this number and 50% are above.
This is a **vertical line** inside the "box."
4. The upper quartile is the middle of the upper half of the data.
75% of the data values are below this number and 25% are above.
This ends the "box" and starts the last "whisker."
5. The maximum is the largest data value.
This is the end of the last "whisker."

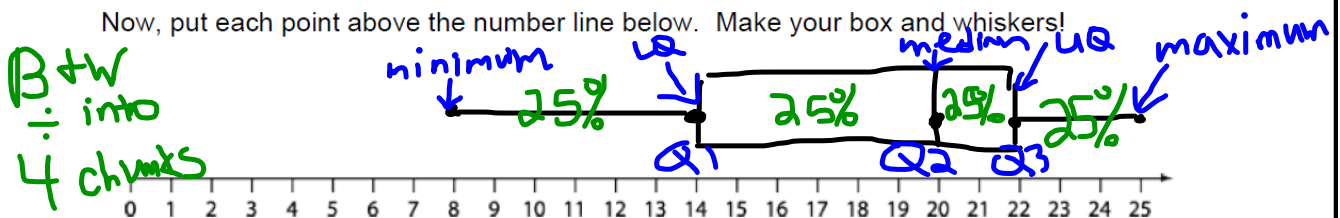
The **INTER-QUARTILE RANGE is the range of the box. This is the middle half (50%) of the data.

~~~~~  
NOW, here's a set of data...you have to order it to find the 5 magic numbers!

lower quartile  
~~8, 20, 12, 16, 18, 22, 24, 14, 25, 20, 24~~  
 8, 12, 14, 16, 18, 20, 22, 24, 24, 25  
upper quartile  
 Rewrite the numbers:  
 med

Circle the five magic numbers in the list you made!

Now, put each point above the number line below. Make your box and whiskers!



B+W  
: into  
4 chunks

range = 25 - 8 = 17 { 32 } IQR = 22 - 14 = 8

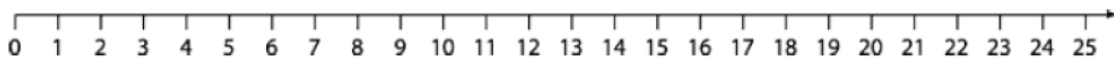
Here's another set of data...do it again!

**16, 18, 12, 10, 14, 10, 8, 12**

Rewrite in order from least to greatest:

What do I do for the five magic numbers if they are "between" data values?

Find the five magic numbers from the data set above. Then make your box-and-whisker plot.



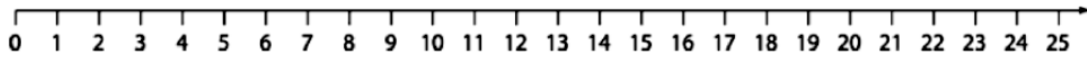
Analysis:

- 25% of the data is below \_\_\_\_\_.
- 50% of the data is above \_\_\_\_\_.
- 75% of the data is below \_\_\_\_\_.
- 50% of the data is between \_\_\_\_\_ and \_\_\_\_\_.
- 50% of the data is in the \_\_\_\_\_.
- 50% of the data is in the \_\_\_\_\_.
- How can a box-and-whisker plot help you to understand a set of data? \_\_\_\_\_
- What is the Inter-Quartile Range (IQR)?
  
- If there are 12 numbers in a set of data, how many numbers are in each part of the box-and-whisker plot?

**“Box and Whisker Plot Activity Sheet”**

1. Make a box and whisker plot of the data below.

2, 3, 3, 5, 6, 8, 10, 12, 13, 14, 14, 15, 18, 18, 21, 22, 23, 23, 24

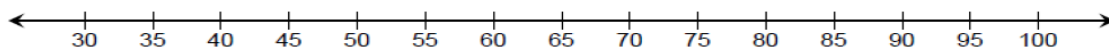


2. What is the lower extreme?
3. What is the upper extreme?
4. What is the range of the data?
5. What is the lower quartile?
6. What is the upper quartile?
7. What is the interquartile range (this is the range of the quartiles, the size of the box)?
8. How many parts are there to a box and whisker plot?
9. What percent is each part of the box and whisker plot?
10. What percent of the data is below 6?
11. What percent of the data is above 14?
12. What percent of the data is represented by the box?
13. What fraction of the data is below the median?
14. What fraction of the data is above 6?
15. What fraction of the data is higher than 14?

16. Create 2 box plots above the number line below (one for each set of data). **Label them!**

**Midwestern States (area in 1,000 mi<sup>2</sup>):** 45, 36, 58, 97, 56, 65, 87, 82, 77

**Southern States (area in 1,000 mi<sup>2</sup>):** 52, 59, 48, 52, 42, 32, 54, 43, 70, 53, 66



What conclusions can you make by looking at the plots above?

\_\_\_\_\_ { 34 } \_\_\_\_\_

HW # 6 ↓



For the following types of data, which measure of central tendency is BEST—mean, median, or mode? Explain.

1. most popular movie in the last month
2. favorite hobby
3. class sizes in a school
4. ages of members in a club

\*\*\*\*CHALLENGE\*\*\*\*

Each person has taken four tests and has one more test to take. Find the score that each person must make to change the mean or median as shown.

5. Barry has scores of 93, 84, 86, and 75. He wants to raise the mean to 86.  
*Hint: When you find the mean, first you add, then divide...now undo (first multiply then subtract).*

6. Liz has scores of 87, 75, 82, and 93. She wants to raise the median to 87.  
*Hint: 87 will be the MIDDLE point (like the fulcrum on a balanced scale).*

7. Li's bowling scores are: 129, 136, 201, 146, 154. Q1  
132.5 med  
146 Q3  
177.5

Make a box plot (find those 5 magic numbers and graph them). What is the IQR?

