

# Probability and Statistics

## Lesson: April 9

Students will be able to create a box and whisker plot from a set of data or be able to interpret the data presented in a box and whisker plot

# Below is a Box and Whiskers Plot



This Box and Whiskers Plot (also known as a Box Plot) is of the ages of 1,000 volunteers at a local food pantry.

- How many volunteers are between 18 and 22 years old?
- How many volunteers are less than 63 years old?
- What percent of the volunteers are less than 18 years old?

Answers on slide 10

## In order to answer these questions you need to know some things about a Box and Whiskers:

1. A Box and Whiskers takes your data and divides it into 4 sections called “Quartiles.” Quartiles sound similar to “Quarter” and they mean exactly the same thing...25%.
2. The spread of each Quartile will not be the same distance but each will contain the same amount of data points.
3. The data points must be smallest to greatest before you begin
4. The intervals on your graph must be consistent (so going up by 1’s, 5’s, 10’s...)

# You need 5 numbers in order to create a Box and Whiskers.

These are called the 5 Number Summary. They consist of:

- a. Min: The minimum number in your data set
- b. Q1: The middle of the lower half (lower quartile)
- c. Median (Q2): The middle number in your data set
- d. Q3: The middle of the upper half (upper quartile)
- e. Max: The maximum number in your data set

The next slide will teach you how to find those 5 numbers.....

# So how do you get numbers you need for the 5 Number Summary?

This video will walk you through how to find the 5 Number Summary if you have an **odd number of data points**.

## [Odd Number of Data Points](#)

This video will walk you through how to find the 5 Number Summary if you have an **even number of data points**.

## [Even Number of Data Points](#)

# Quick Check:

What is the 5 Number Summary for this set of data points?  
(remember that you must put them in order from smallest to greatest before starting)

**40, 34, 27, 12, 13, 40, 37, 41, 35, 21, 33**

Min:

Q1:

Median (Q2):

Q3:

Max:

# Quick Check: ANSWERS

What is the 5 Number Summary for this set of data points?

12, 13, 21, 27, 33, 34, 35, 37, 40, 40, 41 (numbers smallest to greatest)

**Min: 12**

**Q1: 21**

**Median (Q2): 34**

**Q3: 40**

**Max: 41**

Now can you graph it? (remember that your graph intervals must be constant)

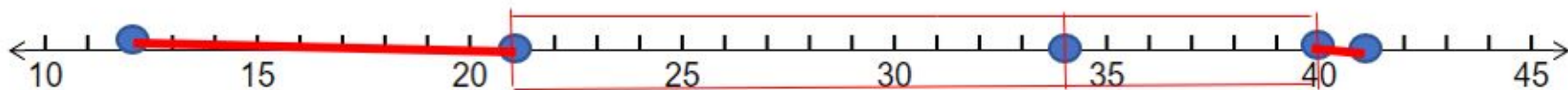
Since my numbers start at 12 and end at 41, I think I will use a scale of 1's or 5's

Try creating your own box plot and then look at the next slide to see if you are correct...



Now can you graph it? (remember that your graph intervals must be constant)

Since my numbers start at 12 and end at 41, I think I will use a scale of 1's or 5's  
By 1's



By 5's



**GREAT JOB!**

# Answers to the Bell Ringer:



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- Since the graph breaks the data into 4 quartiles, 18-22 yrs old is 1 of the quartiles so you need 25% of the 1,000 people.  
 **$1,000 \div 4 = 250$  people are 18-22 yrs old**
- Since 63 marks the 3rd quartile, 75% of the people are below that mark and you will need 3 of the quartiles.  
**We already know that 1 quartile is 250 people so 3 quartiles will be 750 people. (you could also do  $1,000 * .75$ )**
- Since 18 marks the 1st quartile, 25% of the people are below that mark.  
**1 quartile = 250 people (from above) but they didn't ask for "how many" they only asked for the percentage so the answer is 25%.**

Practice creating & reading Box Plots:

[Creating Box Plots](#)

[Reading and](#)

[Interpreting Box Plots](#)

[Creating Box Plots](#)

[with Answers](#)