Before we begin, are there any questions from last day's work?

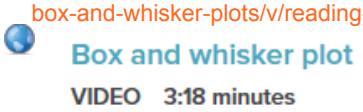
Today's Learning Goal(s):

By the end of the class, I will be able to:

a) calculate the 1st and 3rd quartiles, "by hand"
b) calculate the interquartile range, "by hand"
c) interpreta box-and-whisker plot

Begin the class by showing the Khan academy clip:

https://www.khanacademy.org/math/probability/descriptive-statistics/box-and-whisker-plots/v/reading-box-and-whisker-plots



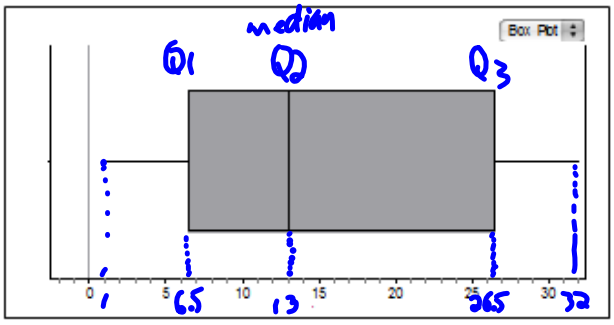
(*If time permits at the end*):
The second video is an instructional video on how to construct a box-and-whisker plot.
This will help you complete homework question #9 on p.146.
You may wish to skip forward to the 2:30 mark.
(before this time, he is simply reading the problem, and putting the data in numerical order)

https://www.khanacademy.org/math/probability/data-distributions-a1/box--whisker-plots-a1/v/constructing-a-box-and-whisker-plot

MBF 3CI Date: Oct-19/17

3.5 Measures of Spread: Part 2

There are **more** ways to measures spread. Another way is to calculate **quartiles** and create **box-and-whisker plots.**



A set of data that has been ordered and divided into four groups, with (approximately) an equal number of values, has been divided into **quartiles.**

Ex. 1: Using the data 1, 27, 2, 15, 32, 4, 26, 11 calculate the:

a) median, first quartile, and third quartile
b) interquartile range
c) identify key features on the box-and-whisker plot provided

ANSWERS:

Q2=13

a) 1, 2, 4, 11, 15, 26, 27, 32
Median datum = between 4th and 5th datum (why?)
Median=13 (sometimes called Q2)
Q1=1st Quartile
1, 2, 4, 11
Q1=3
Q3=3rd Quartile
15, 26, 27, 32
Q3=26.5

median position = $\frac{n+1}{2}$
$= \frac{8+1}{2}$
$= 4.5$
∴ between 4th & 5th data

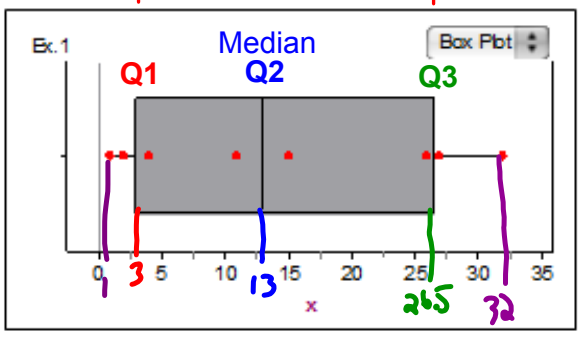
b) Interquartile Range = Q3 - Q1
= 26.5 - 3
= 23.5

c) Middle **Half** of data is between Q1 and Q3

Middle **Half**

Ex.1

	x
1	1
2	27
3	2
4	15
5	32
6	4
7	26
8	11



Ex. 2: Let's practise the ideas above using the test marks: 90, 62, 77, 84, 63, 81, 67, 63, 54, 41, 89

a) Find the first, second and third quartile.

41, 54, 62, 63, 63, 67, 77, 81, 84, 89, 90 (Q1, Q2, Q3)

Q2 (Median) = 67

Q1 = 62

Q3 = 84

b) Find the range of the data.

Range = 90 - 41

= 49

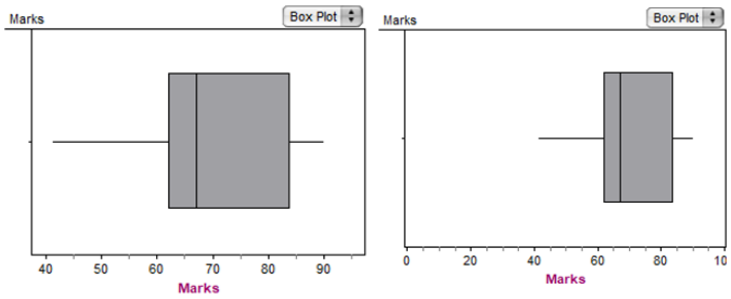
c) Calculate the interquartile range.

IQR = Q3 - Q1

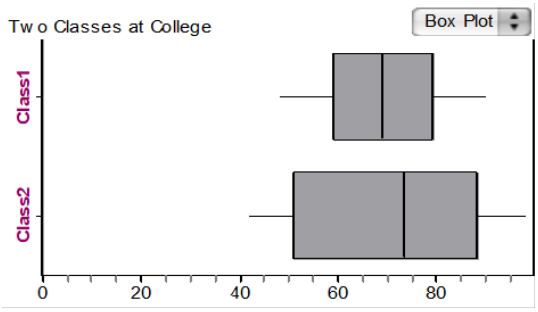
= 84 - 62

= 22

d) Compare two box-and-whisker plots for this data:



Ex. 3: Using the data from p.140 in the textbook, I have created two box-and-whisker plots to compare the data from two first-year math classes' midterm marks at Caldwell College.



a) **Using the Box Plot**, estimate the median for both classes:

Class1 median: 69 % Class2 median: 73 %

b) **Using your answer from a)** which class performed better? Explain.

Class 2 performed better based on these numbers, because the median is higher.

(73% vs. 69%)

c) **Using the Box Plot**,
explain why the median is not always the best indicator of how well a class performed.

It is not always the best indicator, because it does not indicate how much more spread out the marks are compared to Class1.

Class1 had more consistent scores with a smaller interquartile range (20 vs 35), as is seen in the box plot.

d) In your opinion, which class performed better? Explain.

Class2 performed better.
They had a higher median, and higher scores overall.
(even though they also had the lowest scores, too)

Entertainment:

1. Go to p.556 in the text. Near the bottom left change the answers for 1b) and c) to….
   1b) first quartile: 107; third quartile: 140
   1c) 33

2. Go to p.145 and complete #1.
   DID YOU MAKE CHANGES TO THE ANSWERS IN THE BACK???
   CHECK YOUR ANSWERS IN THE BACK.

3. Go to p.146 and complete #9. For help with this question, refer to the second video posted in our Google Classroom titled: "Constructing a boxplot (video) / Khan Academy.