WORLD 10-4A
QUARTILES

<u>Learning Intention:</u>
Goals: To be able to determine Quartiles in a list of data

5 9 9 10 12 | 12 12 13 13 15 | 16 16 16 17 17 | 18 19 19 19 20

25%   Q1   25%   Q2   25%   Q3   25%
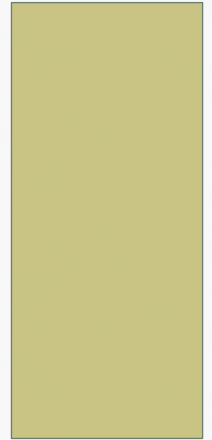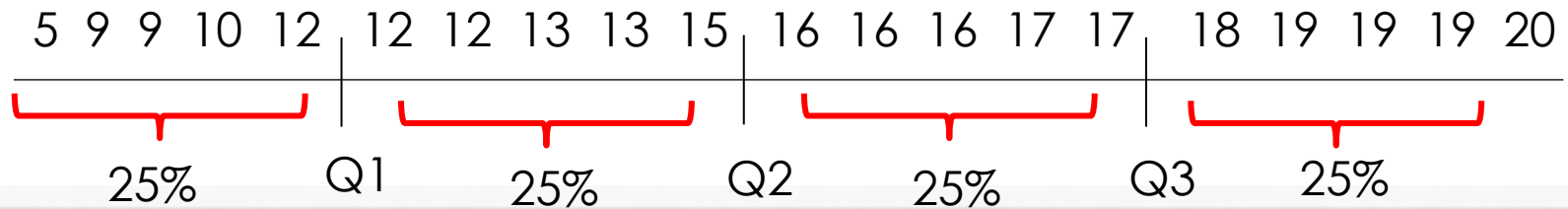
- Imagine that you had a quiz out of 20, and here is a list of all the results in our class.

- You can divide a group of data up into four groups, each group with the SAME NUMBER OF DATA.
  - Example: if there were 20 test marks, each group has 5 marks in it

- The first quartile, Q1 marks the data point that contains the first 25% of all numbers in your list.

- The second quartile, Q2, is the same thing as the *median! It's right in the middle!* All the data before Q2 is in the first 50% of the list, and all data after is in the 2nd 50% of the list

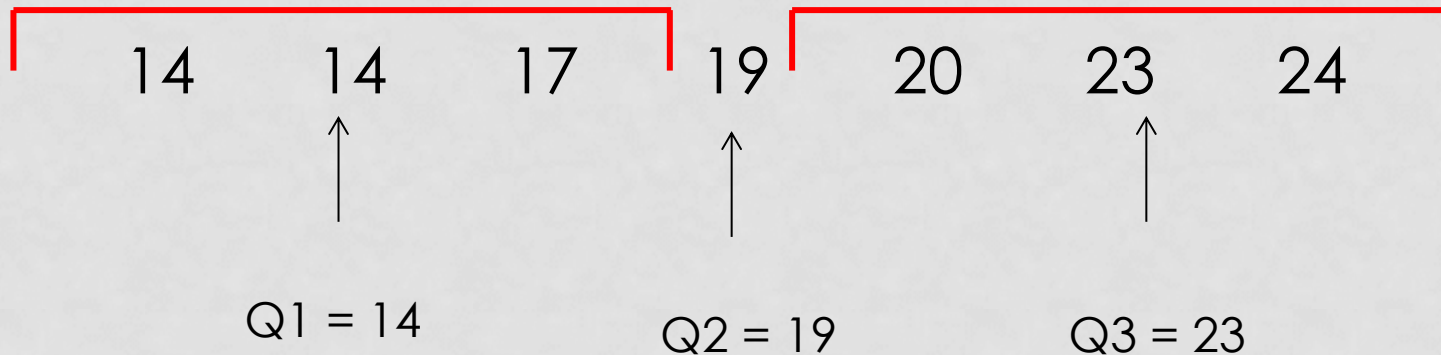- All data from Q3 and beyond up are the last 25% of the list

EXAMPLE

Here is a small distribution of data. (Could be ages, etc)
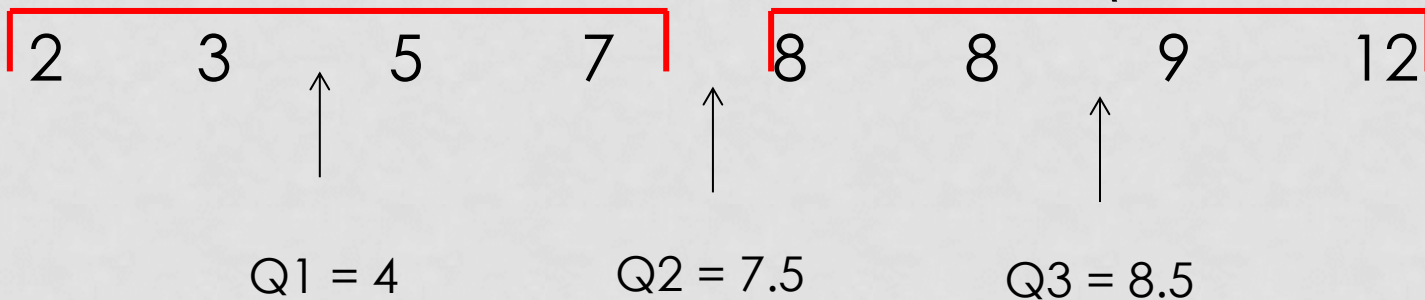
2   3   5   7   8   8   9   12

Q1 = 4   Q2 = 7.5   Q3 = 8.5

1. What is the median of the entire list? (Q2)

2. What is the median of the first half of the list? (Q1)

3. What is the median of the second half of the list? (Q3)

EXAMPLE 2

14   14   17   19   20   23   24

Q1 = 14   Q2 = 19   Q3 = 23

1. What is the median of the entire list? (Q2)

2. What is the median of the first half of the list? (Q1)

3. What is the median of the second half of the list? (Q3)

WARM UP

Here is a list of temperatures (°C) recorded in the first 10 days of March in Gatineau.
-15, -12, -10, -5, 0, 2, 5, 5, 10, 10

a) What is the *range* of temperatures? (max – min?)

   10 – (-15) = 25 degrees

b) What is the *variation interval?* [min, max]

   [-15, 10]

c) What are the quartiles?   Q1 = -10, Q2 = 1 , Q3 = 5

d) What is the *interquartile range?* (Q3 – Q1)

   5 – (-10) = 15 degrees

e) What is the *interquartile interval?*   [-10, 5]

LEARNING

Learning Intention:

- To be able to determine Quartiles in a list of data
- To represent data in a box and whisker plot

Keys to Success:

- I can find Q1, Q2, and Q3 to draw the box
- My whiskers go to the highest and lowest value
- I understand that 25% of the data lie within each section
- I can identify the most condensed and most dispersed

WHAT DO YOU NOTICE?

Example: Create a box and whisker plot using this data:

7, 19, 6, 12, 5, 17, 6, 13

1→ "order"   5 6 6 **7** **12** 13 17 19

2→ Find the Median = 7+12= 19 /2 = **9.5**

3→   5 6 6 7   **9.5**   12 13 17 19

Lower quartile=__6__   Upper quartile= _____15_____

4→ Lower extreme = ____5____   Upper extreme = ____19____

5   6   9.5   15   19

WORLD 10-4B: BOX AND WHISKER

Important points:

1) You can NEVER determine the mean from a box & whisker plot.

2) You can always determine the median. (Median = Q2)

3) Each segment of the graph represents 25% of the data. If the box or whisker is short, the data is **compressed**. If the box is wide, the data is more spread (or **dispersed**).

BOX AND WHISKER

1. List numbers in order from least to greatest
2. Find the median (Q2)
3. Find the median of the first half (Q1)
4. Find the median of the second half (Q3)
5. "Whiskers" go to lowest and highest numbers

Interquartile range = Q3 – Q1

Range = Highest - Lowest

Figure 2. Carl's and Angela's box and whisker plots