UNIVERSITY OF WATERLOO
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Faculty of Mathematics

Centre for Education in
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Grade 7 & 8 Math Circles
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Statistics II

Representation of Data

There are numerous ways data can be displayed in statistics.

Types of Representation of Data:

1. Pictographs
2. Bar Charts
3. Line Graphs
4. Pie Charts
5. Stem-and-Leaf Plots
6. Box and Whisker Plots

Definition
Stem-and-leaf plot: a method of organizing numerical data in order of place value. The stem represents every digit except for the last. The leaf represents the last digit.

Example

Data: 215 216 222 228 229 233 234 236 237 241 242 243 254 254 255

Stem	Leaf
21	5 6
22	2 8 9
23	3 4 6 7
24	1 2 3
25	4 4 5

Definition
Box and whisker plot: a visual representation of the distribution of data using the extremes, median, and quartiles.

Steps in Creating a Box and Whisker Plot:

1. Arrange the data in ascending order.
2. Find the median, lower quartile, and upper quartile.
3. Draw a number line large enough to represent the smallest and largest value.
4. Plot a point where the smallest and largest value are above the number line.
5. Draw vertical lines above the number line where the lower quartile, median, and upper quartile are. Join the lower quartile and upper quartile lines to form a box.
6. Draw a line from the smallest value to the left side of the box and a line from the largest value to the right side of the box.

Exercise 4

1. Create a stem-and-leaf plot to organize the following data and determine the mean, median, and mode.

   12 18 20 107 48 22 86 20 73 64 31 39 20 24 105 94 101 20 18 17 12 17

2. Create a box and whisker plot to represent the following data.

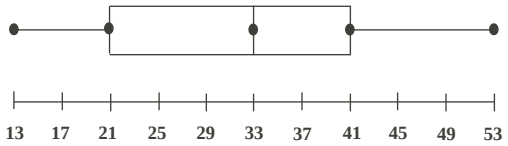
   34 21 22 41 42 43 36 20 28 37 38 34 45 48 47 25 32 33 26 46 42 49 31 51 43 21 39

Problem Set

1. Create a stem-and-leaf plot and box and whisker plot to represent the following data.

   80 83 92 97 81 73 71 84 91 86 76 79 98 91 93 76 70 80 89 81 84
   85 86 94 92 73 76 79 80 94 97 70 75 74 92 93 83 80 74 72 82 73 92

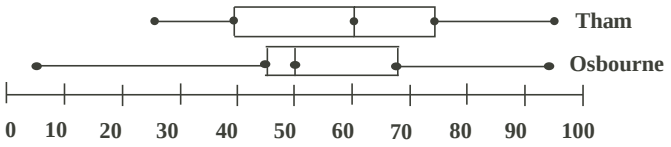
2. Given the below diagram what is the lower quartile, median, upper quartile, and range.



3. To the right is a graph recording how many lengths of the pool student's swam in Mrs.Smyth's class. How many students swam at least 24 lengths but less than 53?

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

4. Below is a diagram on how much the Tham and Osbourne family spend on groceries each week. Which family has the higher median spending?



Problem Set Solutions

1. $Q_1 = 76$, $Q_3 = 92$, median=82.
2. $Q_1 = 21$, $Q_3 = 41$, median=33, range=40.
3. 10
4. Tham family