Chapter 2 - Statistics

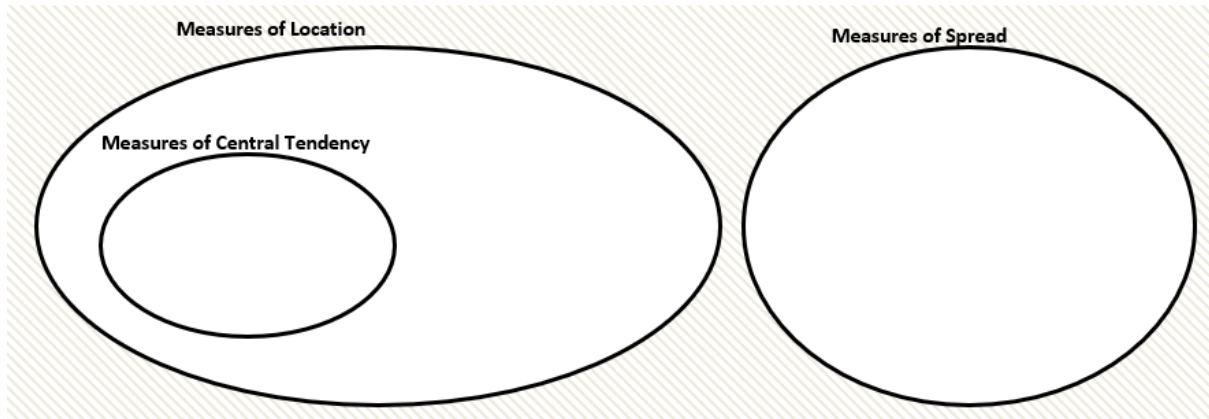# Measures of Location and Spread

Chapter Overview

1. Measures of Central Tendency
2. Other measures of location
3. Measures of Spread
4. Variance and Standard Deviation
5. Coding

2.3	Interpret measures of central tendency and variation, extending to standard deviation.	Data may be discrete, continuous, grouped or ungrouped. Understanding and use of coding.
		Measures of central tendency: mean, median, mode.
		Measures of variation: variance, standard deviation, range and interpercentile ranges.
		Use of linear interpolation to calculate percentiles from grouped data is expected.
	Be able to calculate standard deviation, including from summary statistics.	Students should be able to use the statistic x
		$$S_{xx} = \sum(x-\overline{x})^2 = \sum x^2 - \frac{(\sum x)^2}{n}$$
		Use of standard deviation $= \sqrt{\dfrac{S_{xx}}{n}}$ (or equivalent) is expected but the use of $S = \sqrt{\dfrac{S_{xx}}{n-1}}$ (as used on spreadsheets) will be accepted.

1. Measure of Central Tendency

Measures of…

Measures of Location

Measures of Central Tendency

Measures of Spread

Finding the mean
Using your calculator

On a Classwiz:
- Select 1-Variable.
- Enter each value above, pressing = after each entry.
- Press AC to start a statistical calculation.
- Press the OPTN button. "1-Variable Calc" will calculate all common statistics (including all on the left). Alternatively, you can construct a statistical expression yourself – in the OPTN menu press Down. "Variable" for example contains $\bar{x}$. This will insert it into your calculation; press = when done.

Diameter of coin x (cm)	2.2	2.5	2.6	2.65	2.9

Grouped Data

Height h of bear (in metres)	Frequency
$0 \leq h < 0.5$	4
$0.5 \leq h < 1.2$	20
$1.2 \leq h < 1.5$	5
$1.5 \leq h < 2.5$	11

Mini-Exercise

1.

Num children (c)	Frequency (f)
0	2
1	6
2	1
3	1

2.

IQ of L6Ms2 (q)	Frequency (f)
$80 < q \leq 90$	7
$90 \leq q < 100$	5
$100 \leq q < 120$	3
$120 \leq q < 200$	1

3.

Time t	Frequency (f)
$9.5 < t \leq 10$	32
$10 \leq t < 12$	27
$12 \leq t < 15$	47
$15 \leq t < 16$	11

Exercise 2A/2B Pages 22-23, 24-25

Combined Mean

Example

The mean maths score of 20 pupils in class A is 62.

The mean maths score of 30 pupils in class B is 75.

   a) What is the overall mean of all the pupils' marks.

   b) The teacher realises they mismarked one student's paper; he should have received 100 instead of 95. Explain the effect on the mean and median.

Question

Archie the Archer competes in a competition with 50 rounds. He scored an average of 35 points in the first 10 rounds and an average of 25 in the remaining rounds. What was his average score per round?