MATHS

Lesson 11

Year 7

Topic: Data representation and interpretation

Calculating measures of centre and spread using technology

Today you will:

- calculate mean, median, mode and range using a spreadsheet.

Resources

Digital

Video — Calculating measures of centre using a spreadsheet (2:17)

Find and prepare

Sheet 9 — Mean, median, mode using a spreadsheet

Sheet 6 — Sample data (optional; from a previous lesson)

Exercise book

Key terms

data (data set), mean, median, mode, range

For definitions and explanations of terms, please see the Glossary.

Lesson

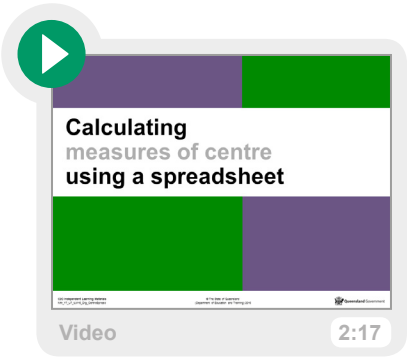
Calculating measures of centre and spread using spreadsheet software

In this lesson, you will use spreadsheet software. The pictures and instruction included in this lesson have been designed for Microsoft Excel 2010. If you have a different version, your steps will vary slightly. Use the help function or contact your teacher if you have any difficulties finding where to calculate measures of centre and spread in your spreadsheet software.



Let's have a look at how to use spreadsheet software to calculate mean, median, mode and range. This skill is particularly useful when dealing with large sets of data, because it reduces the time needed to complete calculations. You can also use this skill when you calculate the measures of centre and spread for multiple data sets in future lessons.

1. Watch the **Video — Calculating measures of centre using a spreadsheet**.



Calculating measures of centre using a spreadsheet

- Open spreadsheet
- Enter title of spreadsheet and category titles
- Enter data for all categories
- Formulas are identified by an equal sign '='
- The first and last cells containing necessary data are identified using brackets, cell names and a colon, for example: (B3:B7)
- The words in a formula for each measure of centre are:

  Mean average

  Median median

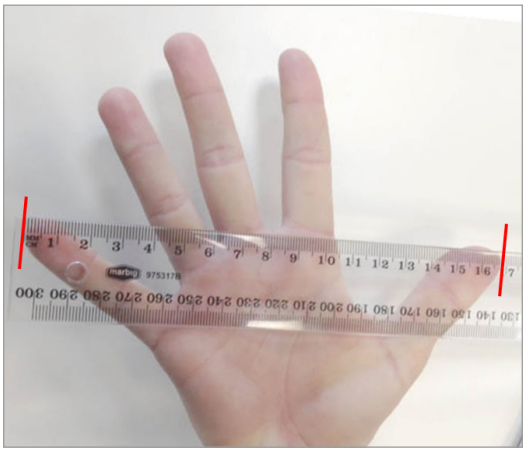
  Mode mode

  For example, to calculate a mean the formula would look like:

  = average(B3:B7)

2. The hand spans of students in a Year 7 class (to the nearest centimetre) are:

   16, 18, 15, 16, 18, 18, 17, 20, 18



   a. What is the measurement of your hand span?

   b. Include your measurement with the class above and use spreadsheet software to calculate the mean, median and mode of the data set.

   c. To help guide you, follow the steps on **Sheet 9 —** Mean, median, mode using a spreadsheet.

   Calculating **range** involves subtracting the minimum value from the maximum value. If the list of values are in cells A1 to A10, then the formula to be entered is: =Max(A1:A10) – Min(A1:A10). Use this, or a similar formula, to calculate the range of the data set.

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3. In the next lesson, you will complete an inquiry task in which you will analyse the outcomes of dice rolls. Let's prepare for it by working through the steps below to answer the question:

> If I roll two four-sided dice and multiply the two numbers, what will the mean, mode, median and range be?

a. Identify all the possible outcomes when rolling two four-sided dice. Enter your answer into spreadsheet software. The first part has been completed as an example for you below.

	A	B	C
1	**Dice 1**	**Dice 2**	
2	1	1	
3	1	2	
4	1	3	
5	1	4	
6	2	1	
7	2	2	

Continue for all possible outcomes.

b. Each pair of numbers then needs to be multiplied. Achieve this by working through the following steps:

   i. Click in cell C1.

   ii. Add the column heading: Dice 1 × Dice 2.

   iii. Click in cell C2.

   iv. All formulas start off with an equal sign, so type in an '='.

   v. Then click on cell A2.

   vi. Then enter the multiplication sign, which is * (this can be added by holding SHIFT and the number 8).

   vii. Then click on cell B2.

   viii. To finish the formula, hit Enter. (To cancel the formula, hit the Escape key.)

   ix. To finish, right click on cell C2, select Copy and click on cell C2, drag down to calculate the other rows and press Enter.

Formula

C2		=A2*B2
	A	**B**	**C**
1	**Dice 1**	**Dice 2**	**Dice 1 x Dice 2**
2	1	1	1
3	1	2	
4	1	3	
5	1	4	
6	2	1	
7	2	2	
8	2	3	
9	2	4	
10	3	1	

Cell C2

Black square

c. Now the numbers in column C need to be sorted in ascending order to make it easy to identify the median value. Do this by working through the following steps:

   i. First add a new title called ‘Sorted outcomes’ in cell D1.

   ii. Select cells C2 to C17 and copy and paste the values into column D, by clicking on the cell D2 and clicking paste option ‘123’ (values).

   iii. Select the cells D2 to D17 and click on the Data tab and then click on the ‘sort smallest to largest’ button, ensuring you sort just column D.



	A	B	C	D
1	Dice 1	Dice 2	Dice 1 x Dice 2	Sorted outcomes
2	1	1	1	1
3	1	2	2	2
4	1	3	3	2
5	1	4	4	3
6	2	1	2	3
7	2	2	4	4
8	2	3	6	4

d. Now calculate the mean, median, mode and range of the values in column D. If you need help, refer to **Sheet 9**.

4. For further practice, find two or more large sets of data online, in print form or data from **Sheet 6 —** Sample data, and use a spreadsheet to find the measures of centre and spread for each data set.

