

# MATHS TREATS

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## MATHEMATICS AND SPREADSHEETS

Spreadsheets originated as an electronic version of paper worksheets used by accountants. A spreadsheet is a large table with rows and columns to organise, analyse, store, and share data. Data (numbers), formulas and text are entered into the cells of the table.

### MATHEMATICAL EXPLORATIONS

	A	B	C	D	E
1	Example for $y = 2x + 3$				
2					
3	x	y			
4	1	5			
5	2	7			
6	3	9			
7	4	11			
8	5	13			

Spreadsheets can perform many calculations to model a situation, test scenarios, and produce graphs. Their use can be an efficient way to perform mathematical explorations of ideas, identify patterns, and test conjectures.

#### ACTIVITY

Use a spreadsheet to find Pythagorean triples ( $c^2 = a^2 + b^2$ ). (Tip: Make a table with  $a$  and  $b$  being the rows and columns.)  
 Use a spreadsheet to find the last digit(s) of the powers of any number. What patterns can you find in the last digits of the powers of different bases? Compare the difference between simple and compound interest over time, or how changing the repayments, or making an extra payment, affects the rate at which a home loan is paid off. What other mathematics explorations could be assisted with a spreadsheet?

### REFERENCES AND FURTHER READING

<https://en.wikipedia.org/wiki/Spreadsheet>

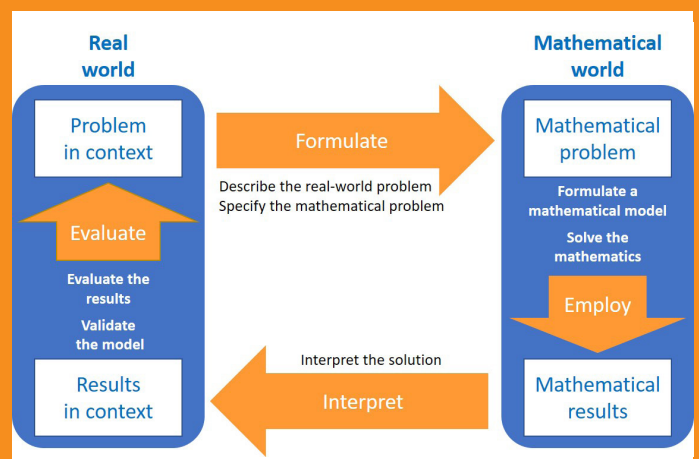
A video introduction to spreadsheets  
[www.youtube.com/watch?v=7Q2C9MB-YH4](http://www.youtube.com/watch?v=7Q2C9MB-YH4)

[www.mathsisfun.com/pythagorean\\_triples.html](http://www.mathsisfun.com/pythagorean_triples.html)

[www.immchallenge.org.au/supporting-resources/mathematical-modelling-framework](http://www.immchallenge.org.au/supporting-resources/mathematical-modelling-framework)

[www.immchallenge.org.au/supporting-resources/student-generated-modelling](http://www.immchallenge.org.au/supporting-resources/student-generated-modelling)

### REAL-WORLD CONTEXTS



Spreadsheets can be used for mathematical modelling of real-world problems. The process of modelling is both cyclical and iterative as shown in the diagram above. The first steps involve identifying and describing the real-world problem. From this, a mathematical model can be built with assumptions, variables, and relationships. The solutions should then be interpreted to ensure they make sense in the real-world context. If the solutions are not adequate, the model itself should be evaluated and refined.

#### ACTIVITY

Use a spreadsheet to create mathematical models for some of the following real-world contexts or find your own problems to model. What will Australia's population and growth be over the next 20 years? How much new housing will need to be built each year? Will Victoria have enough water in 10 years' time? Think about the variables. What are the relationships between the variables? What assumptions do you need to make? What happens if you change some of your assumptions?

Galbraith, P., & Holton, D. (2018). Mathematical modelling: A guidebook for teachers and teams. At [www.immchallenge.org.au/files/IM2C-Teacher-and-student-guide-to-mathematical-modelling.pdf](http://www.immchallenge.org.au/files/IM2C-Teacher-and-student-guide-to-mathematical-modelling.pdf)

Organisation for Economic Co-operation and Development (OECD). (2017). PISA 2015 assessment and analytical framework: Science, reading, mathematics, financial literacy and collaborative problem solving. Revised edition. At <https://doi.org/10.1787/9789264281820-en>

Images: Leadbeater possum - Steve Kuitert, others from Pixabay. Mathematical modelling framework adapted from OECD (2017) and Galbraith and Holton (2018)