

7-9: REMOTE MATHS

EDITION 5

NUMBER AND ALGEBRA

Mathematical language: Symmetry, fractal, dependent variable, independent variable, axes.

TASK 1: MUSIC + MATHS: SYMMETRY

Explore the interconnectedness of music and mathematics. View the video: <http://www.ams.org/publicoutreach/math-and-music#videos>

- Follow the steps to try and create your own fractal.

TASK 2: MAGIC SQUARES

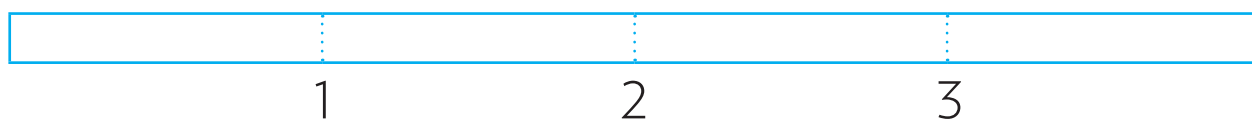
Watch the video of Ethan Brown quickly solving a magic square: <http://www.mathaware.org/mam/2014/calendar/magicsquares.html>

- Then watch the tutorial of Ethan Brown showing you how to create a magic square
- Draw a grid of a 4 x 4 magic square and challenge a family member or a friend to give you a total and see how quickly you can solve the magic square. (Don't share the secrets with your friend/family member, and watch their jaws drop when you solve one in a couple of minutes!)
- **Extending prompt:** watch the tutorial and learn how to build more complex magic square. Can you build your own complex magic square?

TASK 3: PAPER FOLDING

Take a strip of paper about 30 cm long and 2 cm wide. Fold it in half then in half again. When you unfold you will see that 3 creases have been made.

- If you fold your strip in half 10 times how many creases would there be?
- Is there a pattern?
- **Enabling prompt:** Record your findings (number of folds and number of creases) systematically in a table.
- **Extending prompt:** Can you find a rule to work out number of creases for any number of folds.



















EDITION 5: NUMBER AND ALGEBRA (CONT.)

TASK 4: PRE-ALGEBRA SHAPE PUZZLE *Source: Nrich*

Each symbol in the diagram has a numerical value. The total for the symbols is written at the end of each row and column.

- Can you find the missing total that should go where the question mark is?
- Can you find other ways to solve this problem?

| | | | | |
|---|---|---|---|----|
|  |  |  |  | 28 |
|  |  |  |  | 30 |
|  |  |  |  | 18 |
|  |  |  |  | 20 |
| ? | 30 | 23 | 22 | |

TASK 5: MOBILE PHONE PLANS

You are comparing two mobile phone companies, Aptus and Welstra.

- Aptus offers a monthly fee of \$35.00 plus \$10 per gigabyte (GB) of data.
- Welstra offers a monthly fee of \$70 plus \$5 per gigabyte (GB) of data.

Consider the following (there is no right or wrong answer):

- Which plan would be better for you. Why?
- Which plan would be better for your mum/dad/teacher? Why?
- Which plan would be better for your grandma/grandpa/sibling? Why?

Compare the total monthly fee for each company.

- The cost depends on _____.

Because Cost depends on the other variable, it is called the dependent variable.

Data usage does not depend on the variable, Cost, so it is called the independent variable.

| data (GB) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------------|---|---|---|---|---|---|---|---|---|---|----|
| Monthly fee (\$) Aptus | | | | | | | | | | | |
| Monthly fee (\$) Welstra | | | | | | | | | | | |

Use a table like this one to help organise your information. Summarise your findings in your own words.

If Cost (in dollars) was given the variable C and Data (number of GB) was represented by variable n , then what would be the algebraic rule you could use to represent the relationship between C and n . Enabling prompt: If the number of GB of data was n , what would monthly cost be?

Extending prompt: Draw a graph of monthly cost vs. data usage, and plot both mobile phone plans on the same set of axes. What do you observe?

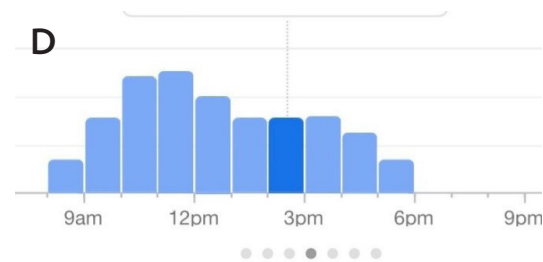
STATISTICS

Mathematical language: Bar chart, pie chart, scatter plot, line graph, tree map.

TASK 1: MATCH THE GRAPHS

Graphs below represent the number of people visiting my local supermarket, chemist, café, and medical centre on a Thursday.

- Match the graphs with the venue.
- Justify your reasoning
- Think, pair share. Discuss with another person.
- Did you change your mind after discussing with someone else?



TASK 2: NETBALL STATS

How many goals did Susie score in netball? Read the clues below and decide how many goals Susie scored.

1. Susie played in seven matches. She scored goals in every match.
 2. Susie's highest score for one match was 8 goals and the lowest was one goal.
 3. The modal score for Susie's matches was 3.
 4. The median goal score for the 7 matches was 3.
- Is there more than one answer? How many possible answers are there?
 - What additional information would you need to ensure there is **only** one possible answer?

EDITION 5: STATISTICS (CONT.)

TASK 3: WHERE ARE YOU FLYING?

Data was collected on the number of planes that flew to each continent from Melbourne airport in 2019.

This data can be represented graphically. Create these graphs on Microsoft Excel to represent the data:

- Bar chart
- Line graph
- Pie chart
- Box and whisker chart
- Scatter plot
- Tree map

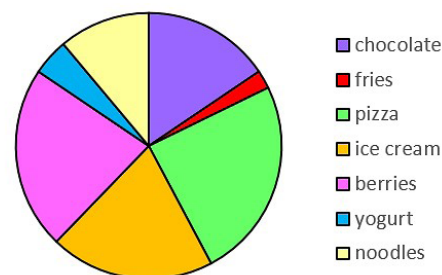
| | |
|---------------|--------|
| Oceania | 72 106 |
| Asia | 63,840 |
| Europe | 30,955 |
| North America | 24,211 |
| Africa | 7,389 |
| South America | 5,432 |

- What can you deduce from each representation?
- What is good and what is bad about each representation?
- Who might create each of these representations and for what purpose?
- Could you create a better representation?

TASK 4: FAVOURITE FOODS

45 children were asked what their favourite food is, from a list of 8 options.

- Can you estimate how many children chose each of the foods?
- Show a friend or family member. Compare your estimates.
- What strategies did you use?



MATHS APP OF THE WEEK: 2048



Join the numbers and get to the 2048 tile. Swipe to move all tiles. When two tiles with the same number touch, they merge into one. Get to the 2048 tile, and reach a high score!

Google Play

<https://play.google.com/store/apps/details?id=com.androbaby.game2048&hl=en>

iOS

<https://apps.apple.com/au/app/2048/id840919914>

Look out for more tasks next week!