WORKING MATHEMATICALLY

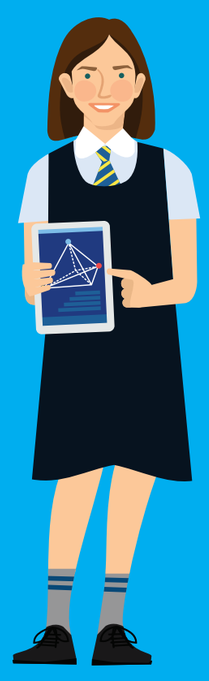
Working like a mathematician is a creative process.
It's all about using strategies!

Find a good problem!

An interesting problem is challenging, interesting and based on the real world around you. Mathematicians will look at their problem and:

- Read and interpret the problem
- Connect what they do and don't know about the problem
- Think of strategies that may be used to investigate the problem

Explore



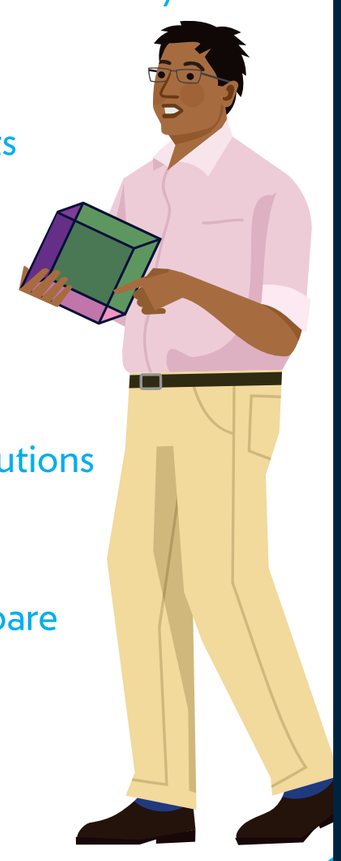
Mathematicians start by finding out more and exploring the problem, therefore developing a plan. Some approaches:

- Connect related ideas
- Collect and organise data
- Discuss ideas with others
- Explore if the problem is similar to others you've tried
- Draw diagrams, tables, charts and graphs
- Look for patterns or connections between and within data
- Ask questions, make estimates or make a hypothesis to test
- Investigate and review information related to the problem
- Identify strategies to help investigate the problem further
- Develop a plan of how to solve the problem

Work on the problem

Mathematicians try many things when they work on a problem:

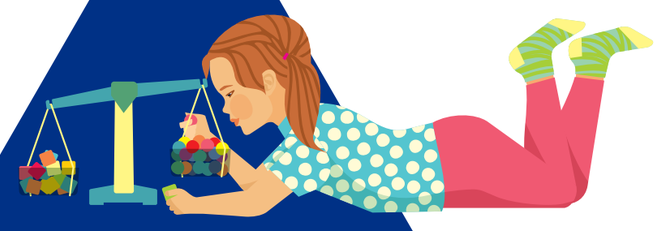
- Look for patterns and connections
- Guess or estimate, then check results
- Try a strategy, and see if it works
- Carry out a plan, revise and try again
- Collaborate with someone
- Draw a chart, picture, graph or visual representation
- Use many strategies and compare solutions
- Write or manipulate an equation or expression
- Find a similar problem and compare strategies used
- Develop an algorithm
- Work backwards
- Look for exceptions
- Make a model



Check and communicate

When mathematicians discover solutions, develop models or collate data form their work, they check their solutions, results and communicate their ideas to others. This may include:

- Justify solutions, inferences and/or conclusions
- Describe and organise thinking for others to read and interpret
- Prove that something is or isn't true
- Compare and contrast related ideas
- Ask further questions
- Seek feedback from others



Questions

Once they understand more about the problem, mathematics will ask more questions like:

- What else do I need to know?
- What happens if...?
- What have others said about this problem?
- Can I break this problem into smaller parts?
- What is the first part I can start with?
- Are there other strategies I can use to find out more?

THE MATHEMATICAL ASSOCIATION OF VICTORIA

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