

# Working Mathematically

## Learning to Work like a Mathematician

First give me an interesting problem.

### When mathematicians become interested in a problem they:

- Play with the problem to collect & organise data about it.
- Discuss & record notes and diagrams.
- Seek & see patterns or connections in the organised data.
- Make & test hypotheses based on the patterns or connections.
- Look in their strategy toolbox for problem solving strategies which could help.
- Look in their skill toolbox for mathematical skills which could help.
- Check their answer and think about what else they can learn from it.
- Publish their results.

### Questions which help mathematicians learn more are:

- Can I check this another way?
- What happens if ...?
- How many solutions are there?
- How will I know when I have found them all?

### When mathematicians have a problem they:

- Read & understand the problem.
- Plan a strategy to start the problem.
- Carry out their plan.
- Check the result.

### A mathematician's strategy toolbox includes:

- |  |                           |
|--|---------------------------|
| • Do I know a similar problem?         | • Act it out              |
| • Guess, check and improve             | • Draw a picture or graph |
| • Try a simpler problem                | • Make a model            |
| • Write an equation                    | • Look for a pattern      |
| • Make a list or table                 | • Try all possibilities   |
| • Work backwards                       | • Seek an exception       |
| • Break the problem into smaller parts | • ...                     |

*If one way doesn't work I just start again another way.*

