THE MATHEMATICAL ASSOCIATION OF VICTORIA

Implementing the Australian Curriculum Reasoning

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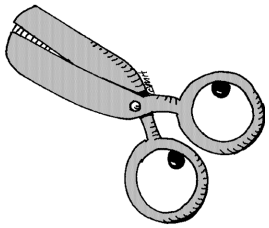
Overview

- Overview of the Australian Curriculum
- Proficiency strands
- Reasoning
- Teach Maths for Understanding



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Australian Curriculum v4.2

- www.australiancurriculum.edu.au

- You may choose to download or print the Australian Curriculum by year level or by capabilities – mathematics!

AusVels http://ausvels.vcaa.vic.edu.au/

Organisation Foundation to Year 10

- Content strands
  - Number and algebra
  - Statistics and probability
  - Measurement and geometry
- Proficiency strands
  - Understanding
  - Fluency
  - Reasoning
  - Problem solving

Proficiencies

- *Understanding*
- *Fluency*
- *Problem Solving*
- *Reasoning*

The proficiency strands describe the actions in which students can engage when learning and using the content.

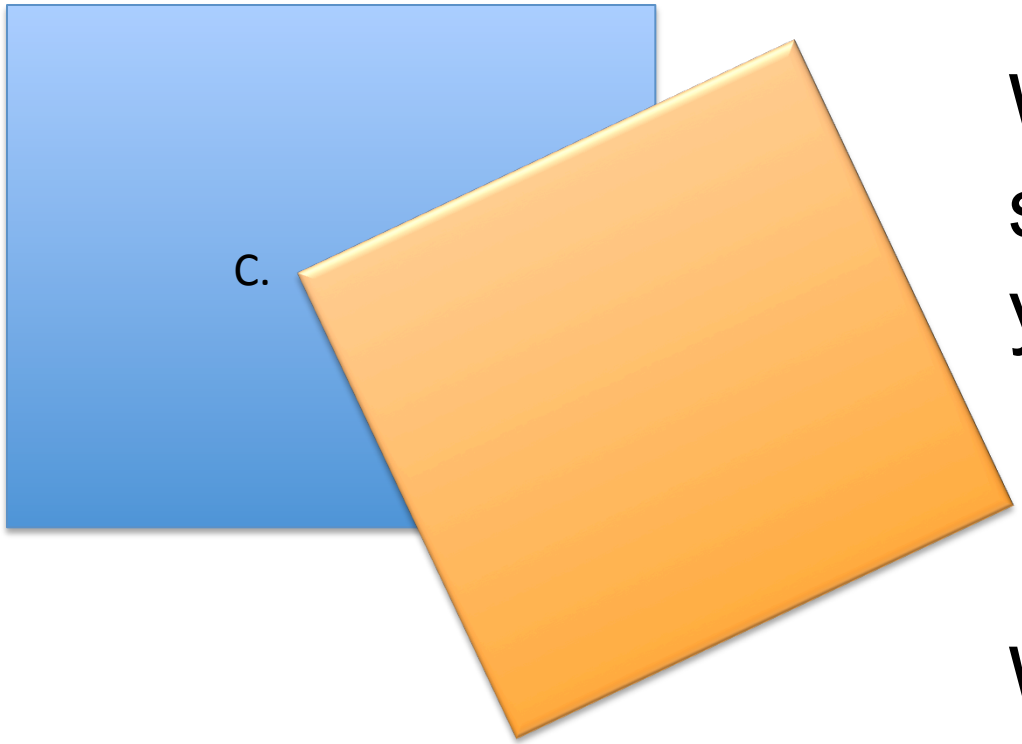
Reasoning

- To think logically about the relationships among concepts and situations
- Answers are right because they follow an agreed assumption through a series of logical steps
- Analysing, proving, evaluating explaining, inferring, justifying and generalising

What might it look like?

- Investigating strategies
- Continuing patterns
- Interpreting results of chance experiences
- Explaining strategies
- Applying understanding
- Justifying the results

Rotating squares



What reasoning strategies did you use?

What was your progression or reasoning?

How do we develop reasoning?

- Provide tasks
- Give time to analyse and explore
- Resist the urge to tell
- Ask probing questions to prompt thinking, including why, how do you know, what is your reason, can you convince me
- Work with a partner

Is it true why or why not?

For example, consider the following problems:

$7 + 4 + 5 = 18 - 2$

$5.6 + 3.07 = 3.07 + 5.6$

$3/5 - 2/3 = 2/3 - 3/5$

$21 \times 34 + 17 = 34 + 17 \times 21$

$7 \times 52 = 3 \times 52 + 4 \times 52$

Can you convince me?

Playing around with adding integers (whole numbers) Max came to two conclusions:

The sum of any four even numbers is a multiple of 4

The sum of any three consecutive numbers must be a multiple of three.

Do you agree with Max's conclusions?

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Missing numbers

$$\begin{array}{r} 5\,8\,? \\ +\ 5\,?\,6 \\ \hline 1\,?\,8\,6 \end{array} \qquad \begin{array}{r} ?\,4\,? \\ +\ 6\,?\,6 \\ \hline ?\,5\,1\,5 \end{array} \qquad \begin{array}{r} ?\,2\,4 \\ -\ 7\,4\,? \\ \hline ?\,8 \end{array}$$

During or at the end of the lesson

- Encourage students to question one another
- Expect students to communicate their reasoning, orally and in writing
- Share explanations and reflections
- Promote comfortable sharing and convincing arguements