Making conjectures using critical and creative thinking in a contextbased classroom

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We will

- Review Critical and creative thinking in the curriculum
- Collect group data
- Inquire, hypothesis and pose questions
- Reason and clarify
- Form learning paths,
- Have some fun!

Victorian Curriculum



Structure

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Critical and Creative Thinking is organised into three interrelated strands: Questions and Possibilities, Reasoning and Meta-Cognition.

Strands	Questions and Possibilities	Reasoning	Meta-Cognition
	Explore the nature of questioning	Explore how to compose,	Explore the use of strategies to
	and a range of processes and	analyse and evaluate	understand, manage and reflect on
	techniques to develop ideas	arguments and reasoning	thinking and learning processes

Vic curriculum

- Questions and possibilities
 - Identify and form links and patterns from multiple information sources to generate non-routine ideas and possibilities
- Reasoning
 - Examine the difference between valid and sound arguments and between inductive and deductive reasoning, and their degrees of certainty

Prove/ Systematically



Hypothesis/ conjecture

Australian curriculum





Aus. curriculum

• Inquiring



Inquire

- pose questions to clarify and interpret information and probe for causes and consequences
- Analysing, synthesising and evaluating reasoning, and procedures
 - assess whether there is adequate reasoning and evidence to justify a claim, conclusion or outcome
 - scrutinise ideas or concepts, test conclusions and modify actions when designing a course of action

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?
- · Guess, check and improve
- Try a simpler problem
- Write an equation
- · Make a list or table
- Work backwards
- · Break the problem into smaller parts

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

- · Draw a picture or graph
- Make a model

Act it out

- Look for a pattern
- Try all possibilities
- Seek an exception

laths30



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Draw a 6 x 6 grid. Fill each square of grid with the numbers 1, 2, 3, 4, or 6. Do NOT use 5!





Measure of central tendencies



- Median the middle number
- Mode the most frequent number
- Mean the average



• Maths 300



THE MATHEMATICAL ASSOCIATION OF VICTORIA



• Where to next?







How has your brain changed during this session?