Anita Chin
inspired mathematics teaching

Problem Solving in the Y3-6 Mathematics Classroom

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"Full STEAM Ahead"

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Presenter

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1. Supporting the integration of STEM learning

NSW Education Standards Authority (NESA)

The NSW Education Standards Authority (NESA) is supporting the integration of STEM learning in schools by providing programming advice to teachers and by developing practical, hands-on teaching and learning units and classroom activities that allow students to integrate their knowledge from the four STEM disciplines.

When developing a unit it is recommended to include a range of practical activities that enhance teaching and learning of the individual subject area content.
http://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/understanding-the-curriculum/programming/stem-support

2. NESA sample integrated units

NESA has developed and trialled a range of Primary STEM activities and units of work for Kindergarten to Stage 6. STEM activities, units and sample work can be found by either stage or by subject area.
http://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/understanding-the-curriculum/resources/sample-unit-work

*Sample unit STEM Early Stage 1 - A Bush Adventure
Sample unit STEM Early Stage 1 - Beanstalk
Sample unit STEM Early Stage 1 - Dinosaurs
Sample unit STEM Stage 1 - Coding a Dance Sequence
Sample unit STEM Stage 1 - Healthy bundles of energy
Sample unit STEM Stage 1 - Sounds and Music
Sample unit STEM Stage 2 - Motion
*Sample unit STEM Stage 2 - Shelters
Sample unit STEM Stage 2 - Space
Sample unit STEM Stage 2 - Time Capsule
Sample unit STEM Stage 3 - A-Maze-ing
Sample unit STEM Stage 3 - Disaster Detection
Sample unit STEM Stage 3 - integrated Greenhouse

3. NESA Mathematics K-10 Syllabus content

The *NSW Mathematics K-10 Syllabus (2012)* contains three content strands with the components of **Working Mathematically** integrated into the content strands. One of the five interrelated components of Working Mathematically is **Problem Solving.** What does 'problem solving' mean to you?

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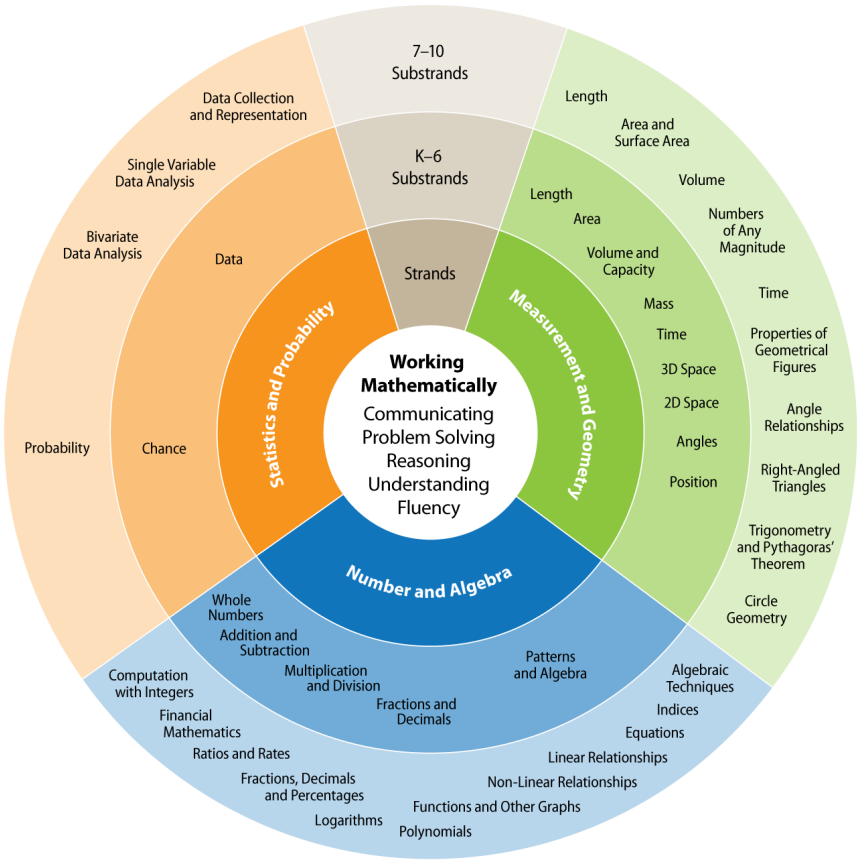
Problem Solving has a separate set of outcomes in the syllabus. So, how is it defined?

Problem Solving
Students develop the ability to make choices, interpret, formulate, model and investigate problem situations, and communicate solutions effectively. They formulate and solve problems when they use mathematics to represent unfamiliar or meaningful situations, design investigations and plan their approaches, apply strategies to seek solutions, and verify that their answers are reasonable.



The diagram represents the relationships between the strands and substrands only.
It is not intended to indicate the amount of time spent studying each strand or substrand.

4. What can problem solving look like in Y3-6?

When considering where is the Maths in STEM, there are many opportunities to solve problems in the Measurement and Geometry strand in Years 3 - 6. However, we need to be mindful of students conceptual understanding of number concepts acquired in K-2 that are prior learning for measurement concepts in the later years.

Task 1: Understanding perimeter in Year 4

I have drawn a shape with straight sides that has a perimeter of 16 cm. What might my shape look like?

(*Open-ended maths activities*. Sullivan and Lilburn, 2005, p79). Book details here.

Task 2: Using perimeter to solve a problem in Year 4

A rectangle has a perimeter 3 times it's length. what could it's dimensions be?

(*Teaching mathematical thinking.* Marion Small, 2017, p112). Book details here.

Task 3: Converting units in Year 4

Last week I wrote a sentence that was like: 2 m is the same as 200 cm. This week, I've forgotten what the words were but I remember one of the numbers was 150. What could my sentence have been?

(*Challenging mathematical tasks.* Peter Sullivan, 2017, p103). Book details here.

Task 4: Perimeter and area in Year 6

Investigate and compare perimeters of rectangles with the same area.

(*NSW Mathematics K-6 Syllabus.* BOSNSW, 2012, p.220). Book details here.