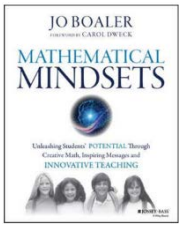
Popular RESOURCES:

Brain plasticity

Video clip (5 mins) https://www.youtube.com/watch?v=pxru8H6XbR4

Professor Jo Boaler, Stanford University, presents an argument, supported by recent brain research, that challenges the belief that some people are good at maths and some are not.

Mathematical mindsets



Boaler J (2016) *Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching,* San Francisco: Jossey-Bass

A very readable book that includes chapters about the brain and learning maths; creating mathematical mindsets; rich tasks; the path to equity; and teaching maths for a growth mindset. Her one page handouts of her ***seven positive norms*** for students (and others) are valuable resources. (also available on youcubed website)

Beliefs and attitudes about mathematics/numeracy

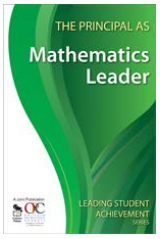
A range of surveys for Pre-school, Primary and Secondary level students, teachers and parents to audit the beliefs and attitudes of your learners, educators and their community Can be found at the Leading Numeracy Improvement Edmodo site (Join code ncuifv)

Handout for parents: youcubed website

https://www.youcubed.org/handout-for-parents/

Six tips for parents to support their child's mathematical learning, together with links to other Youcubed parent resources.

The principal as mathematics leader



Ontario Principals' Council (2009) *The principal as mathematics leader,* California: Corwin Press (76 pages + principal resources)

An overview of how school administrators can start supporting mathematics education in their schools, along with advice about observing and evaluating classrooms, actions principals take, tools for success, and resources.

Advice for graduates

'Becoming a professional teacher of mathematics', Chapter 29 in Siemon,D. Beswick,K. Clark,J. Faragher,R. & Warren, E (2011) *Teaching mathematics: Foundations to middle years,* Melbourne: Oxford University Press

How to learn maths—for students Jo Boaler, Stanford University **(https://lagunita.stanford.edu/courses/Education/EDUC115-S/Spring2014/about)**

Free Online Class (also appropriate for teachers and parents)

Students learn about their own math potential; strategies to learn and relate well to maths; the brain and math strategies and how to be more powerful in maths classes and in life!

3 sessions x 10 minutes

3 sessions x 20 minutes

NB There is also a more extensive fee-paying professional learning course for teachers and parents.

Make it count maths website http://mic.aamt.edu.au/

Make it count is a teaching and learning resource and a professional learning tool for educators working with Aboriginal and Torres Strait Islander learners in mathematics education. It offers pathways, possibilities and ideas for schools and professional learning communities to make their own inroads and innovations into improving mathematics and numeracy learning outcomes for Indigenous learners**.**

Knowledge Resource Book for teachers

A knowledge resource book helps teacher develop a real understanding of the mathematics they will teach and the most effective methods of teaching math topics. Every teacher should have access to this type of resource when designing learning for conceptual understanding, addressing student misconceptions and providing intellectual stretch in mathematics.

Van De Walle JA, Karp KS & Bay-Williams JM (2014) *Elementary and middle school mathematics. Teaching developmentally,* Harlow: Pearson Education Limited.

This resource guides teachers to help all learners make sense of maths with the emphasis placed on teaching conceptually, in a problem-based, developmentally appropriate manner that supports the learning needs of all students. Includes Pause and Reflect prompts and Activities

Additional Supporting resource: The Van de Walle Professional Mathematics Series Vol 1: PreK-2, Vol 2: Yr 3-5 Vol 3: Yr 6-8

Also:

Siemon D, Beswick K, Clark J, Faragher R & Warren E (2011) *Teaching mathematics: Foundations to middle years.* Melbourne: Oxford University Press.

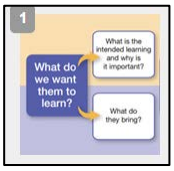
Mathematics Conceptual Development

The Mathematics Developmental Continuum F–10 provides evidence based indicators of progress, linked to powerful teaching strategies, aligned to the progression points.
http://www.education.vic.gov.au/school/teachers/teachingresources/discipline/maths/continuum/Pages/mathcontin.aspx

Assessment of Concept Development
The Scaffolding Numeracy in the Middle Years (SNMY) is a new assessment-guided approach to improving student numeracy outcomes in Years 4 to 8.
Assessment for Common Misunderstandings - These assessment tools are based on a series of highly focussed, research-based Probe Tasks and the Probe Task Manual also includes a number of additional tasks and resources which have been organised to address common misunderstandings.
http://www.education.vic.gov.au/school/teachers/teachingresources/discipline/maths/assessment/Pages/mathsassess.aspx

Designing Learning:

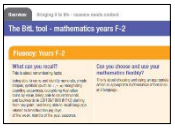
Teachers need to be clear about their learning intentions. The Learning Design template supports teachers to clarify what they want students to learn, how they will know if they got there and what they will do to get them there.
http://www.acleadersresource.sa.edu.au/index.php?page=learning_design



Teachers must reference the learning to the relevant curriculum documents.
http://www.acleadersresource.sa.edu.au/index.php?page=what_you_value
Learning Area Explorers for every year level F-10 allow teachers to investigate and track connections in the Australian Curriculum eg. Content Descriptions, Proficiencies, Achievement Standards, Year Level Descriptions. *General Capabilities Continua* provide benchmark developmental levels for all GC including Early Literacy, Literacy, Numeracy and Critical and Creative Thinking.

Effective Questioning

Effective questioning is an important skill for teachers to scaffold conceptual understanding, identify and address misconceptions and assess learning.



Bringing it to Life Tool has year level appropriate questions for Fluency, Understanding, Reasoning and Problem Solving.

(*BitL Printables* http://www.acleadersresource.sa.edu.au/index.php?page=bringing_it_to_life)

Asking Effective Questions

A very practical and comprehensive reading with the why, the how and the what of effective questioning.

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_AskingEffectiveQuestions.pdf

Rich Learning Experiences

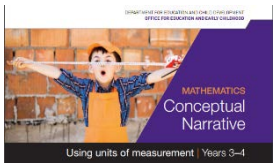
Learning experiences need to be designed to differentiate challenge for every learner with multiple entry and exit points (low floor/high ceiling). Always consider the level of student thinking required.

Transforming Tasks: A resource to support a pedagogical shift from teacher instructed to learner constructed where students are doing the thinking, using 4 strategies: *From Tell to Ask, From Closed to Open, From Procedural to Problem Solving, From Information to Understanding.*

http://www.acleadersresource.sa.edu.au/index.php?page=into_the_classroom Preschool and Year 12 Maths example on USB

Conceptual Narratives: This resource is not yet fully developed. These resources exemplify learning experiences that bring the Proficiencies and content together, supporting learners to construct their own knowledge.

Printables: http://www.acleadersresource.sa.edu.au/index.php?page=bringing_it_to_life



Electronic Resources:

The **nrich** site contains a large collection of high quality maths problem solving tasks, together with suggestions about content that may be related to the task, ways to get started and different (valid) solutions that have been submitted by students from around the world. http://nrich.maths.org

Dan Meyer's blog: 101 questions: http://www.101qs.com Dan's blog contains images and short films that can be presented to students along with the question: *What's the first question that comes to mind?* Also: Dan Meyer 3 Act Lessons.

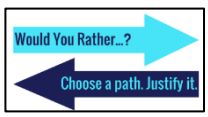
Estimation 180 is a website with a bank of daily estimation challenges to help students to improve both their number sense and problem solving skills.

http://www.estimation180.com/

This **Illuminations** website provides access to quality resources for teaching and learning mathematics, including interactive tools for students and instructional support for teachers.

Pre-K -12

https://illuminations.nctm.org/



Would you rather? A website with multiple situations where students are asked to think deeply about two options, choose and then justify their choice.

http://www.wouldyourathermath.com/ (Also Which One Doesn't Belong? http://wodb.ca/)

A week of Inspirational Maths - You cubed Website

These resources intend to provide important growth mindset messages that will help students feel confident, try harder all year, persist with open and difficult problems and embrace mistakes and challenge. All tasks are low floor and high ceiling – they are accessible to all students and they extend to high levels.

https://www.youcubed.org/week-of-inspirational-math/

Thought Provoking Maths resource provides examples of a model for designing mathematical activities with provocations, investigations, experimentation, problem solving and skill development and represent learning. This is a simple entry point and in conjunction with Learning Design can enrich mathematical learning.

Reading

Westwell,Val,2015.

AAMT Biennial Conference paper: ***Leading Learning. Going beyond the content.***

http://www.acleadersresource.sa.edu.au/features/transforming-tasks/AAMT_PAPER_Val_Westwell_July_2015.pdf