# How do we teach mathematics now?

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# Outline of the session

- What is Inquiry Based Maths? - A look at mathematical problem solving -
- What role does basic facts have in our maths classrooms?
- Helpful and practical ideas that you can use to support your child's learning in mathematics.

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# Why the need for change?

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https://vimeo.com/271901749/db0f8a4915


# Forbes top 5 skills needed to succeed

https://www.forbes.com/sites/ellevate/2018/08/06/the-skills-you-need-to-succeed-in-2020/#3729981f288a

- Complex problem solving.
- Critical thinking.
- Creativity.
- People management.
- Coordinating with others.

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# Our aim

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For all our students to be numerate……..

"to be numerate is to have the ability and inclination to use mathematics effectively – **at home, at work and in the community**"

**The New Zealand Curriculum**

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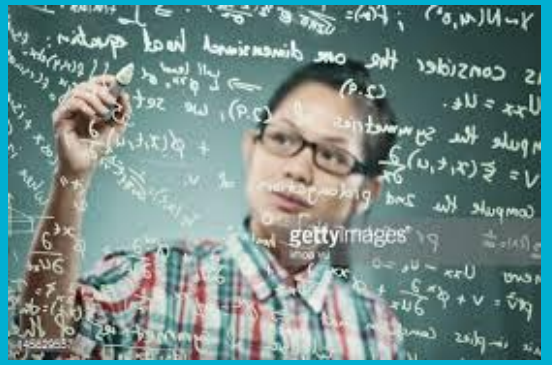
# Let's use a maths lens...

What do Mathematicians do?:




- They perform calculations
- They ask good, inquiring questions
- They propose ideas
- They connect different methods
- They use many different representations
- They reason, justify and provide mathematical proof.

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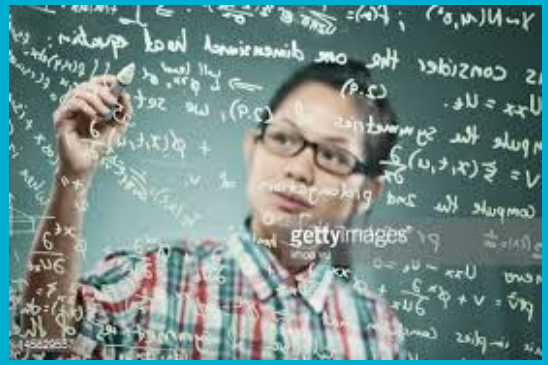
# But wait there's more….




## Mindsets:

- They take risks and try wild ideas.
- They are resilient and persistent.
- They are creative and play with ideas
- They make sense of the maths they are using and applying.
- They make terrific mistakes

# The Brain

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https://www.youtube.com/watch

# Making Mistakes

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[Making Mistakes]

# Mistakes and struggle


*"Imperfection is a part of any creative process and of life, yet for some reason we live in a culture that has a paralyzing fear of failure, which prevents action and hardens a rigid perfectionism. It's the single most disempowering state of mind you can have if you'd like to be more creative, inventive or entrepreneurial."*

Sims (2011) NYT

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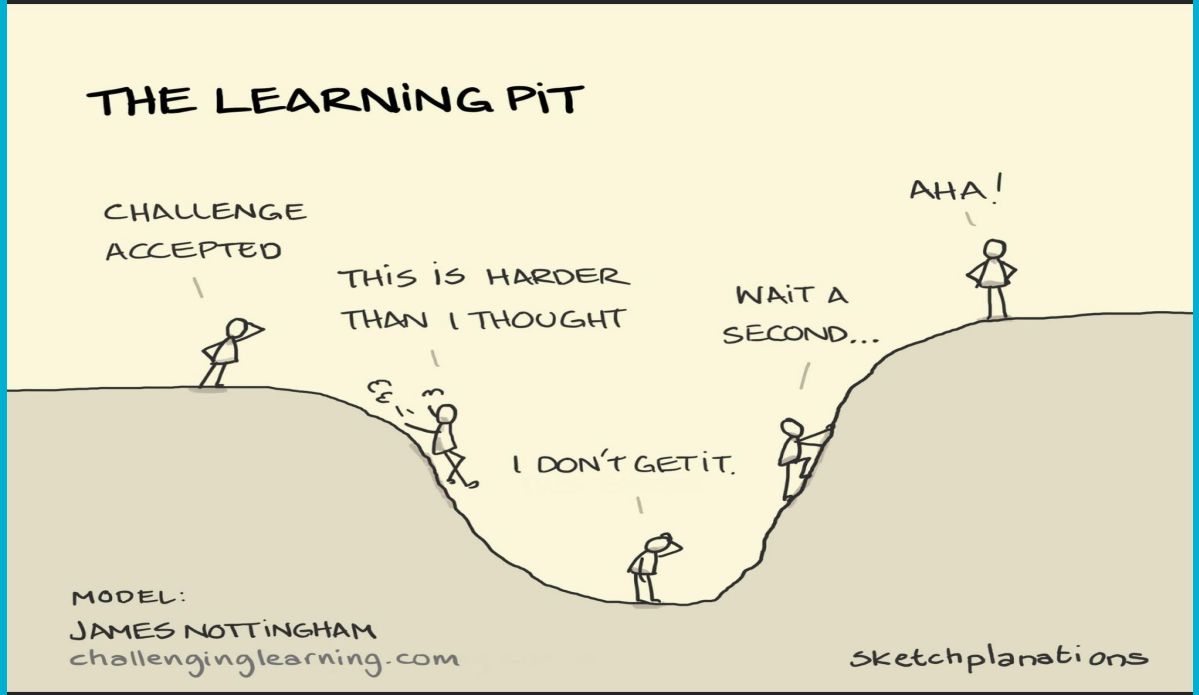
THE LEARNING PIT
CHALLENGE ACCEPTED
THIS IS HARDER THAN I THOUGHT
I DON'T GET IT.
WAIT A SECOND...
AHA!
MODEL:
JAMES NOTTINGHAM
challenginglearning.com
sketchplanations

# Knowledge vs Strategy

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# The difference

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## Knowledge

- Number Identification,
- Number Sequence
- and Order
  Ratio
- Grouping and Place Value
- Basic Facts

## Strategy

* Addition & Subtraction
* Multiplication & Division
* Fractions Proportions and

# Strategy: Your turn…..


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# Multiplicative Strategies


Charlie is planning the Surf Life Saving end of season celebration. He wants to make sure he has enough food and treats for all of the 120 Junior lifeguards who are attending.

He has brought 4 Super Size bags of chippies. Each bag has 28 packets of chippies within it. Does he have enough packets for everyone to have at least one packet each?

Be prepared to explain your thinking and have some mathematical proof to justify your thinking…….

# Multiplicative Strategies

4 x 28

Rounding and compensating
4 x 30 = 120
4 x 2 = 8
120 - 8 = 112

I used doubling and halving
8 x 14 = 112

Place Value Partitioning
4 x 20 = 80
4 x 8 = 32
80 + 32 = 112

I used repeated addition:
28 + 28 = 56
2 x 56 = 112

# How can you help?

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Developing a child's love of maths is the key to their success and ability to progress in mathematics.

Most important is to make the learning fun and as purposeful as possible.

www.nzmaths.co.nz

# Self Belief

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https://www.yo

# Key tips

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1.) Never praise children by telling them they are "smart."
2.) Never share stories of math failure or even dislike.
3.) Always praise mistakes and say that you are really pleased that your child is making them.
4.) Encourage children to work on problems that are challenging for them, so that they can make mistakes.
5.) When you help your children, do not lead them through work step by step, as this takes away important learning opportunities for them.
6.) Encourage drawing whenever you can
7.) Encourage students to make sense of math at all times.

# Key tips

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8. Encourage students to think flexibly about numbers.

9. Never time children or encourage faster work.

10. When children answer questions and get them wrong, try and find the logic in their answers

11. Give children math puzzles

12. Play games

https://www.youcubed.org/wp-content/uploads/2018/03/12-Steps-to-unlock-your-students-math-achievement.pdf

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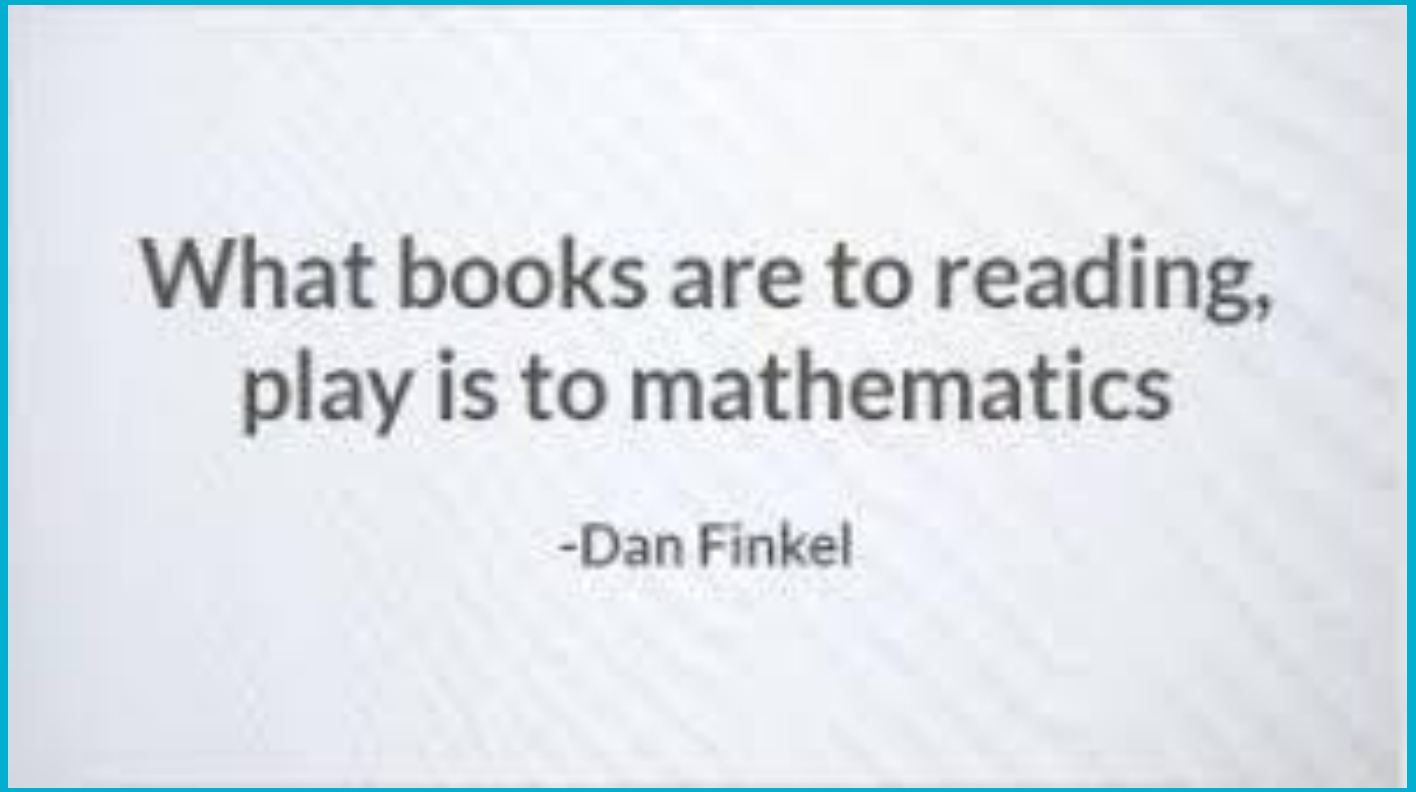

# Basic Facts

- We DO teach this explicitly.
- It does have an extremely important role in children's development.
- However we ensure that the conceptual understanding that underpins Basic Facts is understood very well first.
- There is a very clear sequence and progression when teaching this.

# Let's play

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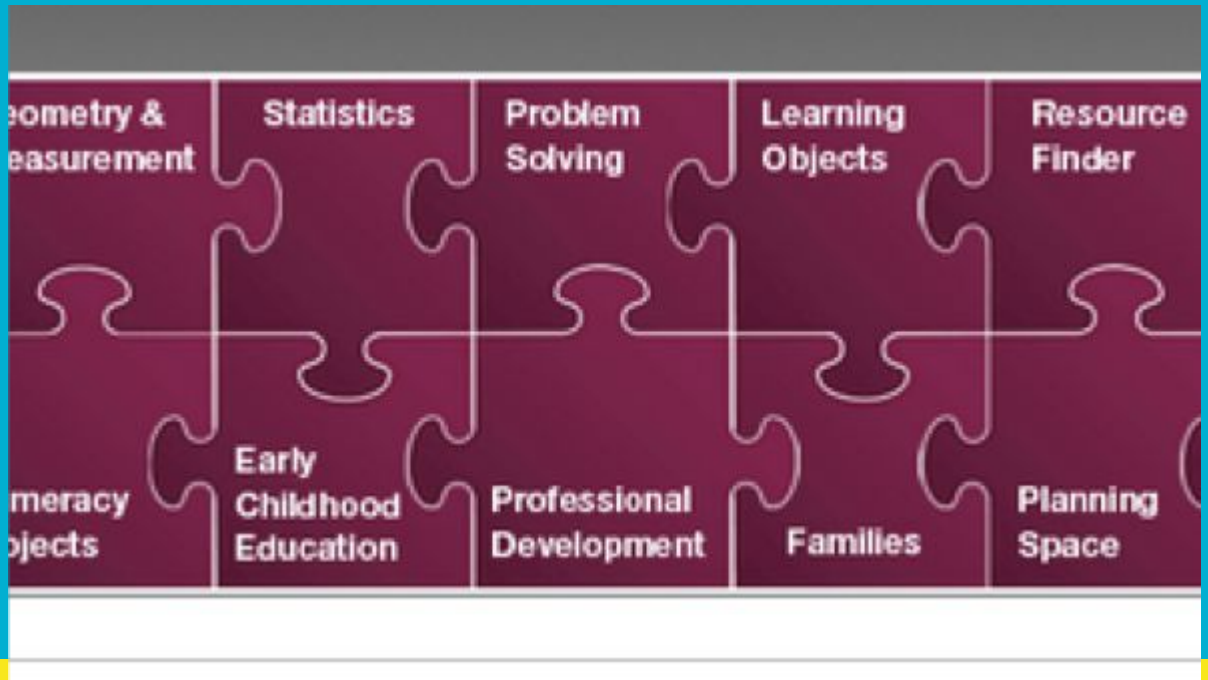
17 x table

# www.nzmaths.co.nz

www.nzmaths.co.nz



# Families

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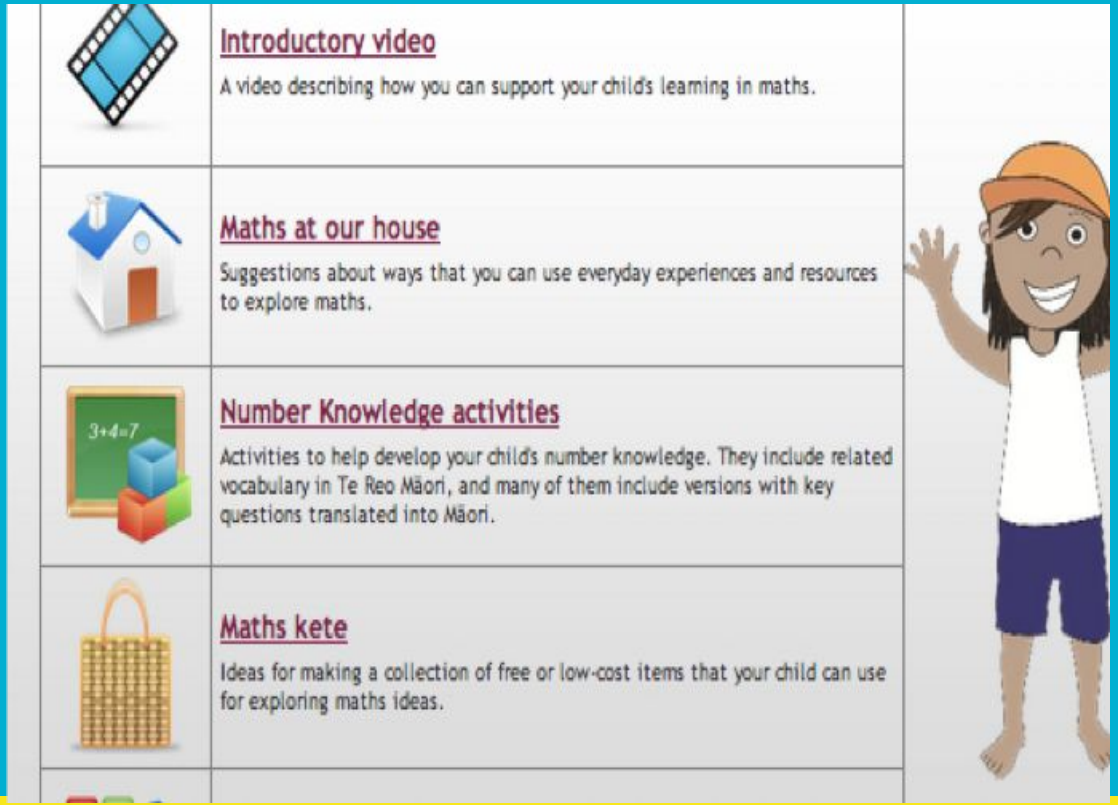


**Introductory video**

A video describing how you can support your child's learning in maths.

**Maths at our house**

Suggestions about ways that you can use everyday experiences and resources to explore maths.

**Number Knowledge activities**

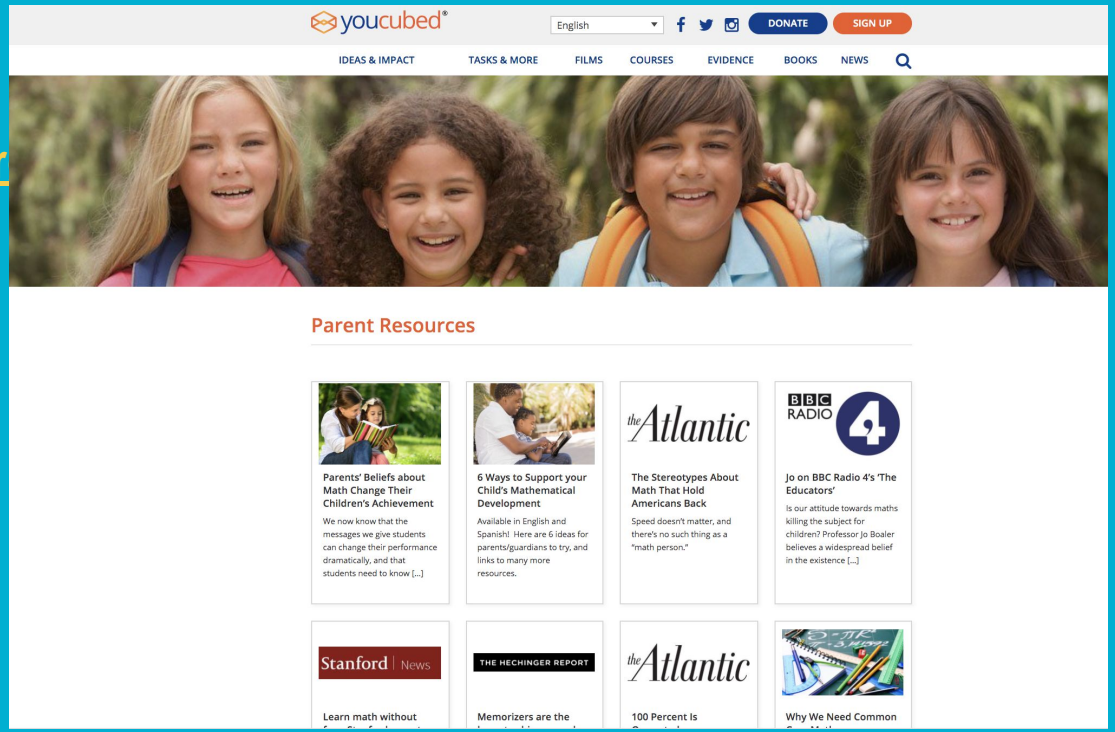
Activities to help develop your child's number knowledge. They include related vocabulary in Te Reo Māori, and many of them include versions with key questions translated into Māori.

**Maths kete**

Ideas for making a collection of free or low-cost items that your child can use for exploring maths ideas.

# Resourcing to support parents

https://www.youcubed.or



# Knowledge Building

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Counting

(cars, shells on beach, pegs, run around the house, how many steps you walk, count backwards, start from different numbers)

Numbers before and after

(Letter boxes, use a numberline, use number cards, write a number down, keyboard numbers, using dice)

# Knowledge Building

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Identifying numbers

(Letter boxes, number plates, speed signs, how many km to go, number cards, combine numbers)

Ordering numbers

(Number cards, write some numbers down)