

# CREATIVITY AND CURIOSITY IN MATHS

**Thornleigh West Public School**

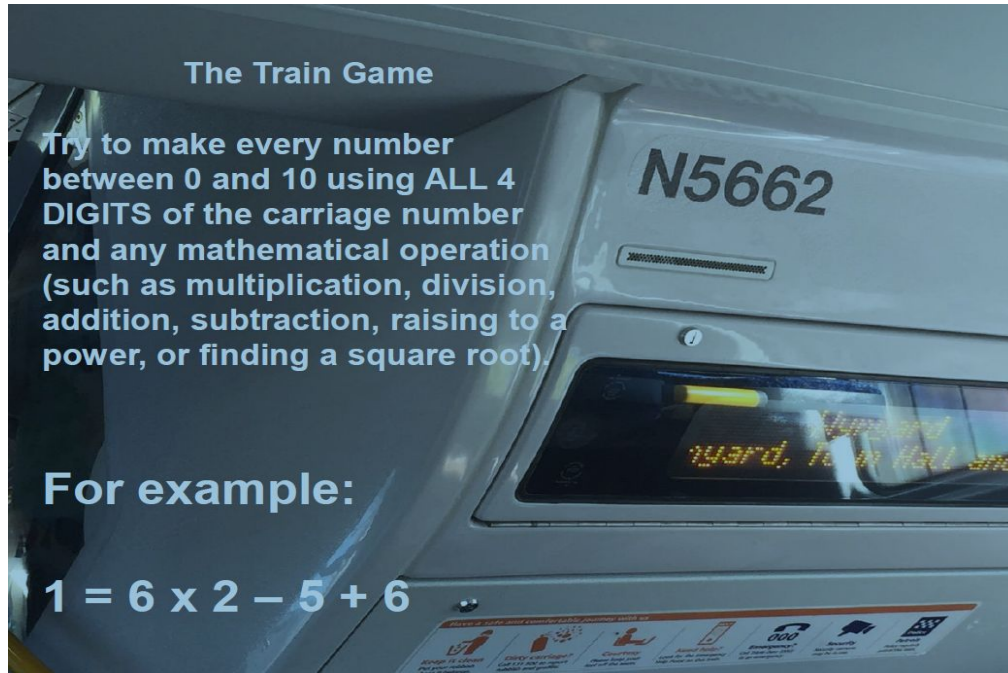
**“I WONDER...”**

## The Train Game

Try to make every number between 0 and 10 using ALL 4 DIGITS of the carriage number and any mathematical operation (such as multiplication, division, addition, subtraction, raising to a power, or finding a square root).

For example:

$$1 = 6 \times 2 - 5 + 6$$



## The Train Game



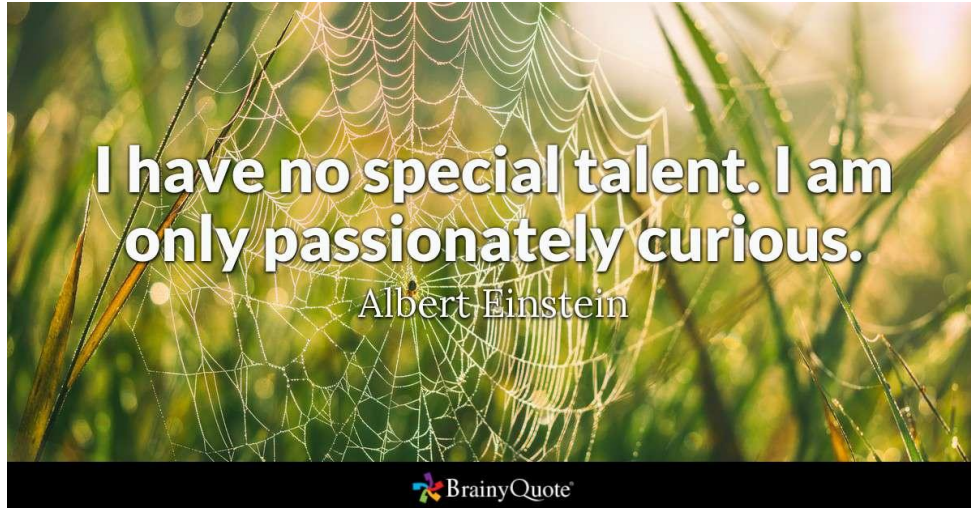
**What do you notice? What do you wonder?**

# WHAT IS CURIOSITY ? WHAT IS CREATIVITY? (MATHS)

Tweet what you think curiosity and or creativity is use #ccgedu

If you don't have twitter use 140 character.

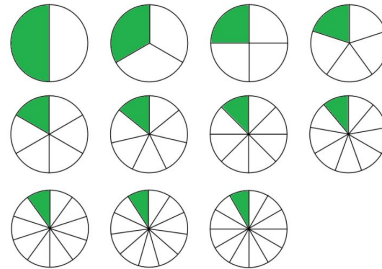
Think Pair Share



## *What is critical and creative thinking, and why is it so important in mathematics and numeracy education?*

- Curriculum mandates creative and critical thinking in Mathematics.
- Problem Solving, Reasoning, Fluency, and Understanding.
- When we embed critical and creative thinking, we transform learning from disjointed, memorisation of facts, to sense-making mathematics. Learning becomes more meaningful and purposeful for students.

**What do you notice?**



# HOW AND WHEN DO WE USE CREATIVITY AND CURIOSITY IN MATHS?

1. Problem solving activities is a good place to start
2. Open-ended tasks are easy to implement, allow *all* learners the opportunity to achieve success, and allow for critical thinking and creativity. Rich tasks - what does this look like?
3. Teacher collaboration to inspire inquiry-focussed lessons. A vital component of these lessons is planning of open-ended "essential questions".
4. Providing student the opportunity to question, all students can access the task and feel confident to ensure a love of maths = engagement.

Great websites:

<http://mathisvisual.com/>

<https://nrich.maths.org/>

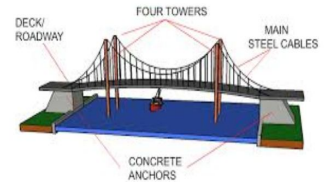
<http://www.maths300.com/>

# A CLASSROOM THAT PROMOTES CRITICAL AND CREATIVE THINKING PROVIDES OPPORTUNITIES FOR:

- higher-level thinking within authentic and meaningful contexts;
- complex problem solving;
- open-ended responses; and
- substantive dialogue and interaction

## Suspension Bridges

What do you notice?



# TEACHERS NEED TO MODEL THE DISPOSITION - CURIOSITY!

- ★ They need to learn to question, to be critical, and to be creative. They need to feel they have permission to engage in exploration and investigation. They need to move from consumers to producers of mathematics.
- ★ Teachers need to think critically and creatively about their practice as teachers of mathematics. We need to be reflective practitioners who constantly evaluate our work, questioning curriculum and practice, including assessment, student grouping, the use of technology, and our beliefs of how children best learn mathematics.



# HOW WILL YOU AND YOUR STUDENTS ENGAGE IN CURIOUS AND CREATIVE THINKING?

We need to ensure we find ways to ‘hook’ students into mathematics and provide opportunities for them to experience the joy of mathematical exploration and discovery.



*This trick is based on a simple mathematical fact: Each pair of opposite faces on a six-sided die always adds up to seven. All you need for this trick is three six-sided dice and basic multiplication, addition and subtraction skills! If you've got that, you're ready for the trick.*

#### Instructions:

- Hand a student the three dice and ask he or she to stack them together so that they form a column
- Turn your back to the student while he/she silently adds up the numbers on the five hidden dice faces. Tell your student to memorise the sum and keep it a secret.
- When three dice are stacked together there are five faces that you can't see: the bottom and top faces of the lowest die, the top and bottom faces of the middle die and the bottom face of the top die. Altogether you get five hidden faces.
- When your student is ready and has figured out the sum of the numbers on the five hidden faces, you can turn around. Tell him/her that you will use your magical powers to name the sum of the five hidden faces, without looking.
- Look at the top face of the stacked column, and subtract the number from 21 (For example, if the top number is 3, subtract three from 21) "Abracadabra, the sum is 18!"