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THE MATHEMATICAL ASSOCIATION OF VICTORIA

MAVCON 2019

Inquisitive, Inspiring Warm Ups

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Warm Ups

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- Why?

Proficiencies

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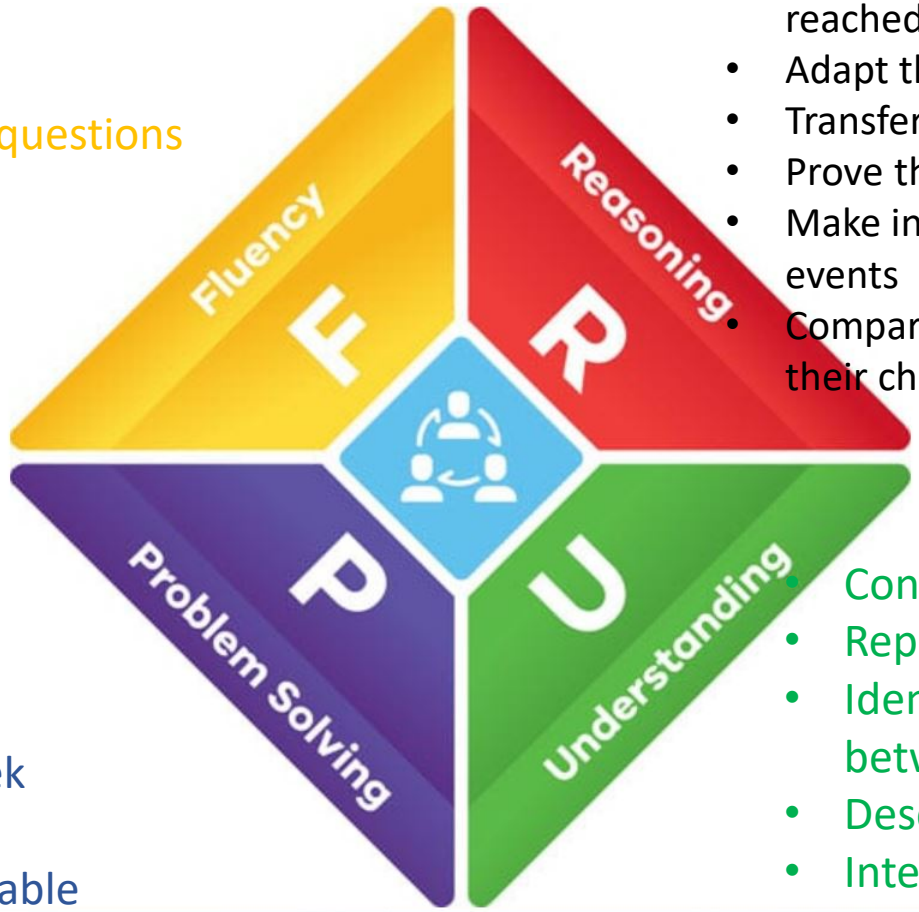
- Making reasonable estimates
- Calculate answers efficiently
- Recognise robust ways of answering questions
- Choose appropriate methods and approximations
- Recall definitions and use facts
- Can manipulate expressions and equations to find solutions



- Explain their thinking
- Deduce and justify strategies used and conclusions reached
- Adapt the known to the unknown
- Transfer learning from one context to another
- Prove that something is true or false
- Make inferences about data or the likelihood of events
- Compare and contrast related ideas and explain their choices

- Use mathematics to represent unfamiliar or meaningful situations
- Design investigations and plan their approaches
- Apply their existing strategies to seek solutions
- Verify that their answers are reasonable

- Connect related ideas
- Represent concepts in different ways
- Identify commonalities and differences between aspects of content
- Describe their thinking mathematically
- Interpret mathematical information

Toothpick puzzles – Farmers problem

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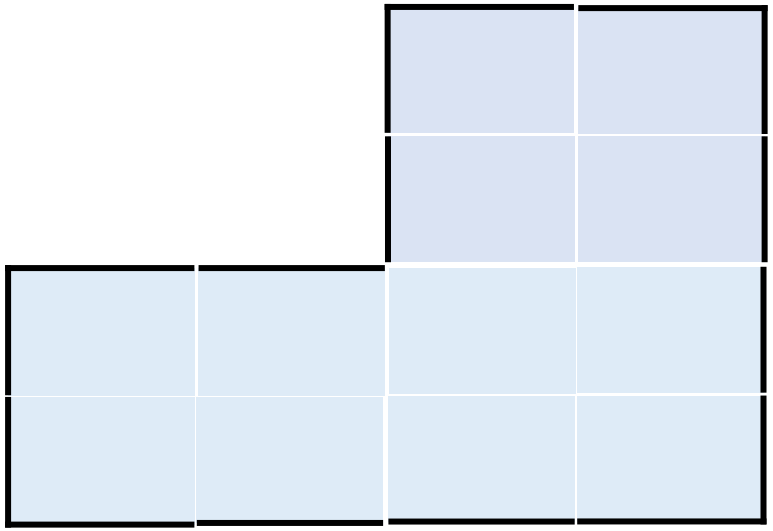

Two farmers have land this shape.

(i) The first farmer wants to divide the land evenly among her **3** sons. Add **4** toothpicks to form **3** blocks of land of equal size and shape

(ii) The second farmer wants to divide her land evenly amongst her 4 daughters. Use 8 toothpicks to form 4 blocks of land of equal size and identical shape.

Toothpick puzzles- Farmers dilemma Solution (i)

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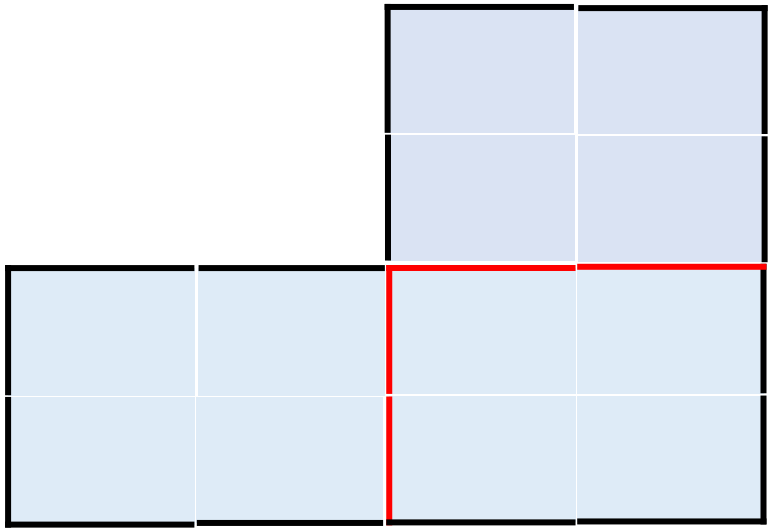

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Possible solution showing 4 toothpicks to add

Toothpick puzzles – Farmers problem

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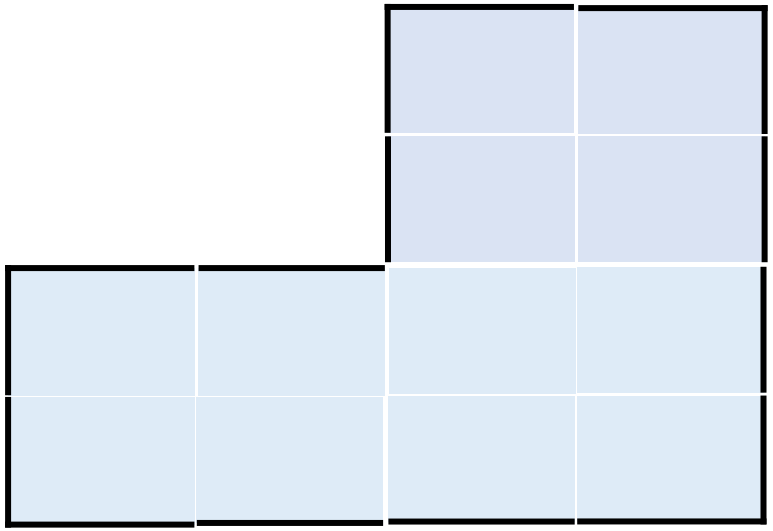

Two farmers have land this shape.
(ii) The second farmer wants to divide her land evenly amongst her **4** daughters. Use **8** toothpicks to form **4** blocks of land of equal size and identical shape.

Toothpick puzzles- Farmers dilema (solution (ii))

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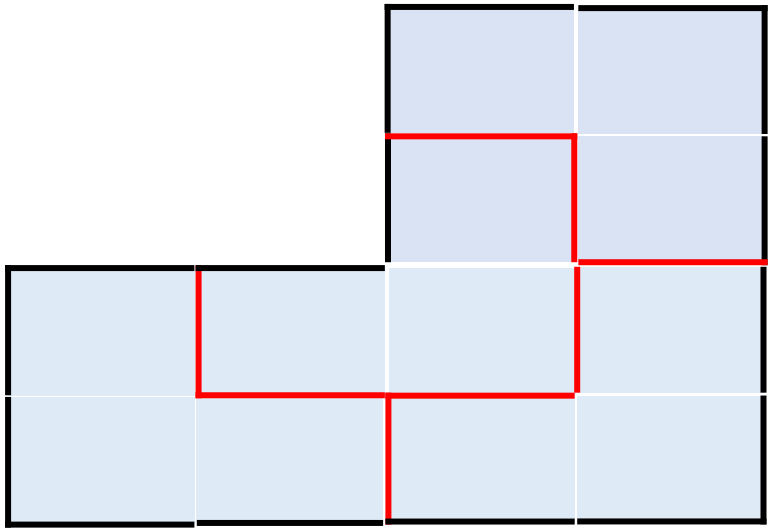

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Possible solution showing 8 toothpicks to add

Warm Up Smorgasboard

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- You will be assigned 4 different Warm Ups

1) Problem of the year

2) The 4 Four 4's

3) Quarter the Cross

4) One – hole punches

Each table group will rotate through all 4 activities – 10 mins per activity

Problem of the year - 2019

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- Using the 2019 digits, i.e. 2, 0, 1, 9
- Can you make up all the numbers from 1 – 10, using the operations

  +, - , ×, ÷,

  and the power of 0 (use this as a last option)

- Complete on the worksheet provided

Problem of the year - 2019

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2019	
1 =	
2 =	
3 =	9 ÷ (2+1) + 0
4 =	
5 =	
6 =	
7 =	
8 =	
9 =	
10 =	

The Four Fours

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- Write the whole numbers from 0 – 20 as calculations, each using exactly four of the number 4 and as many of the operations

$+ \quad - \quad \times \quad \div$ (and brackets)

as required.

e.g. $16 = 4 + 4 + 4 + 4$

Six of the whole numbers from 0 → 20 are not possible, which numbers are they?

The Four Fours

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- Is there one other function or operation you can use which makes ALL 20 numbers possible?

https://blogs.adelaide.edu.au/maths-learning/category/one-hundred-factorial/

@DavidKButlerUoA

Quarter the cross

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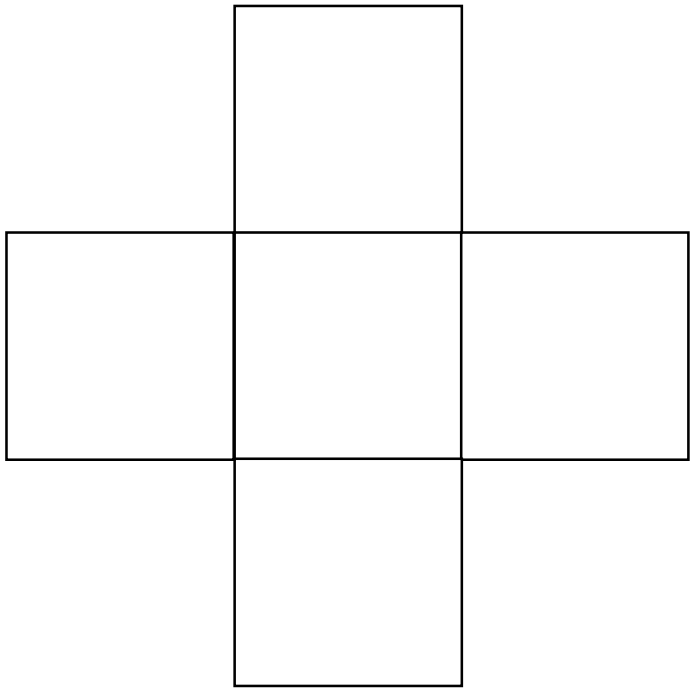
Colour in one quarter of this cross.

You have to be sure it's exactly a quarter.



Quarter the Cross

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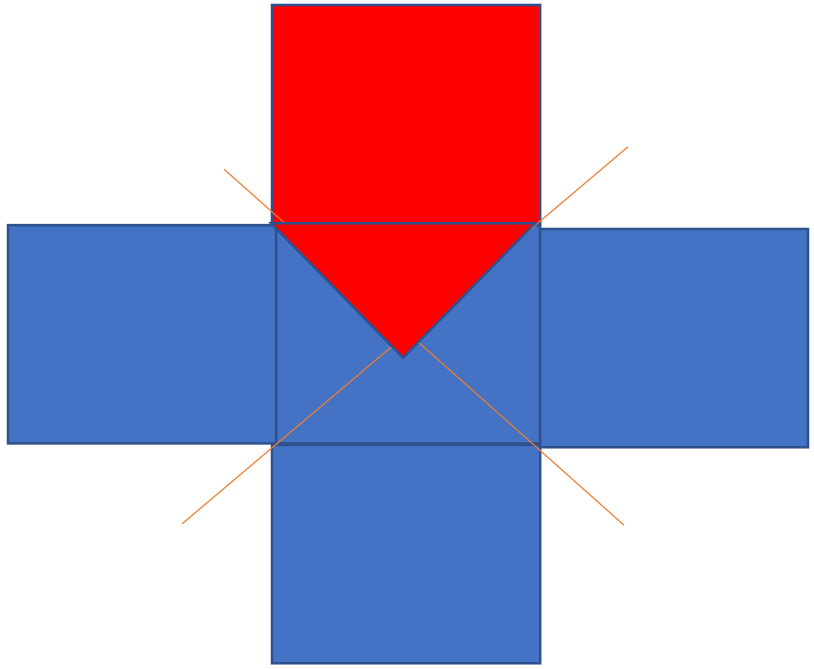

Quarter the Cross

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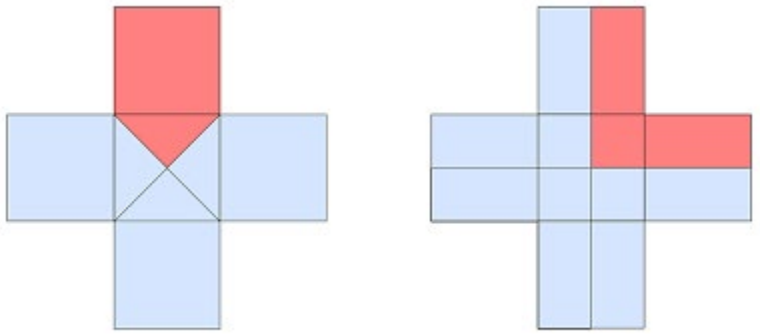

- More solutions tweet

#QuarterTheCross

One-hole punch problems

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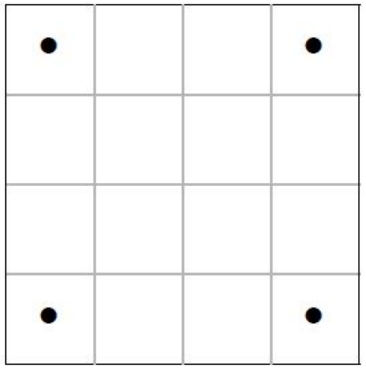
- These are One-Hole Punch puzzles.
- To complete a puzzle, take a square of paper, fold it using as many folds as needed so that if you punch one hole and unfold it, you will match one of the puzzles.
- Complete the following puzzles in any order.
- Be prepared to discuss your strategies with others.



Some reflections

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- How will you introduce these activities to your students?
- What information if any? about strategies will you provide?
- How would allowing students to work in pairs be different than working individually?
- What discussion can take place to help consolidate the learning?
- How might this be helpful before you give the next set of puzzles?
- What will you do if students give up quickly?
- What enabling prompts will you provide?

Match the graphs

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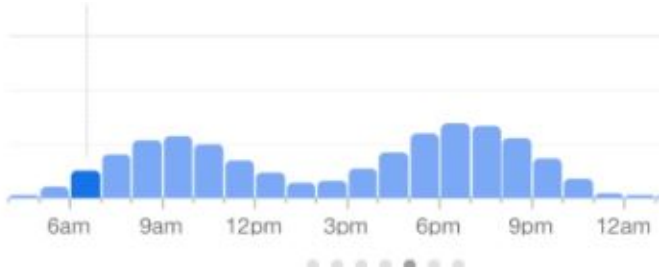
Graphs represent supermarket, library, café, gym. All in Preston.

Think, pair share. Match the graph with the venue. Discuss with partner.

A

B



C

D

Match the graphs

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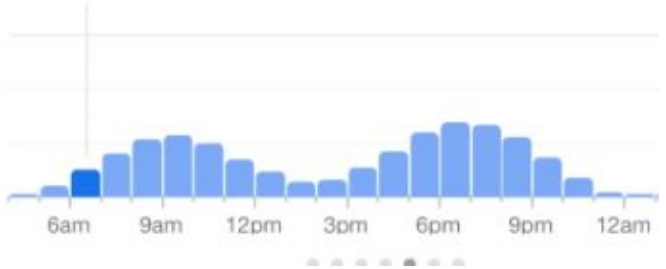
Did you change your mind after discussing with partner?

- SOLUTIONS:

Café

Gym



Supermarket

Library

Some reflections

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- What made these activities good?
- Which proficiencies are being addressed?

A final problem

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- Multiply

111 111 111 by 111 111 111

111 111 111 x 111 111 111

What is your result?

A final problem

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- RESULT

12 345 678 987 654 321

Your feedback

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- The MAV would appreciate your feedback. Please take a couple of minutes to complete the following online survey.

- Friday 6 December 2019
- https://www.surveymonkey.com/r/MAV190612