Mini STEM Showdown

An Adelaide University, School of Education
STEMpire program

Mathematics

Name: _____

Mini STEM Showdown is a series of STEM (Science, Technology, Engineering and Maths) activities to complete. Have fun!

Why Are Numbers Important?

Imagine you're holding a handful of coins. Each coin has a different value, right? Some are small (like 5-cent coins) and some are bigger (like 50-cent coins). Numbers work just like that! They have values too. Knowing what each number means helps us count, add, subtract, and do many things in everyday life.

Here's why number values are so important:

1. **Counting Things**: When you count your toys, lollies, or steps, you use numbers to help you keep track. If you know the value of numbers, it helps you count things correctly!
2. **Buying Things**: When you go to a shop and buy something, you need to know how much money it costs. Understanding numbers helps you know if you have enough money to buy a new toy or favourite snack!
3. **Doing Maths**: When you start adding and subtracting, numbers and their values will help you figure out how many things you have left or how many more you need. Without knowing the value of numbers, maths would be really hard!
4. **Understanding Time**: If you know how to read a clock, numbers help you know when it's time to go to school, eat lunch, or play outside.
5. **Solving Problems**: Numbers are like a secret code that help you solve puzzles! If you want to know how much two things cost together, or how many blocks you need to build a tower, knowing number values and patterns helps you figure it out.

So, mathematics skills aren't just for school, they're tools that help us understand the world better, make choices, and even have fun with games!

Task 1 - When it all stacks up

Task – How large can you make the number at the top of your pyramid?

Make a pyramid using the cups. The number on any cup is the sum of the two cups below it.

For example:

Base Row (Given numbers):

4, 6, 3, 5

Second Row (Sum of Two Below):

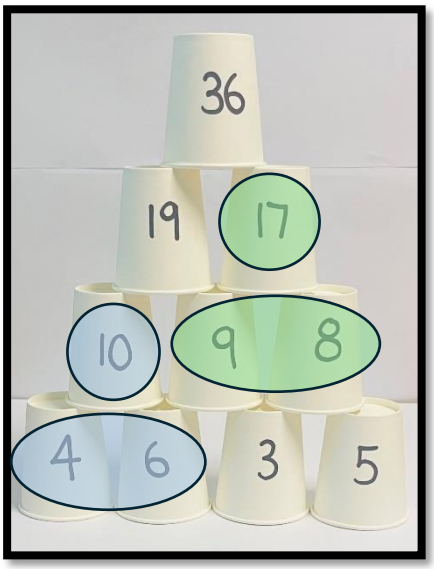
10, 9, 8

Third Row (Sum of Two Below):

19, 17

Top Row (Final Sum):

36



For a harder version try it with larger numbers.

For example:

Base Row (Given numbers):

12, 15, 18, 9

Second Row (Sum of Two Below):

27, 33, 27

Third Row (Sum of Two Below):

60, 60

Top Row (Final Sum):

120



Adelaide University

Outreach STEMpire Programs

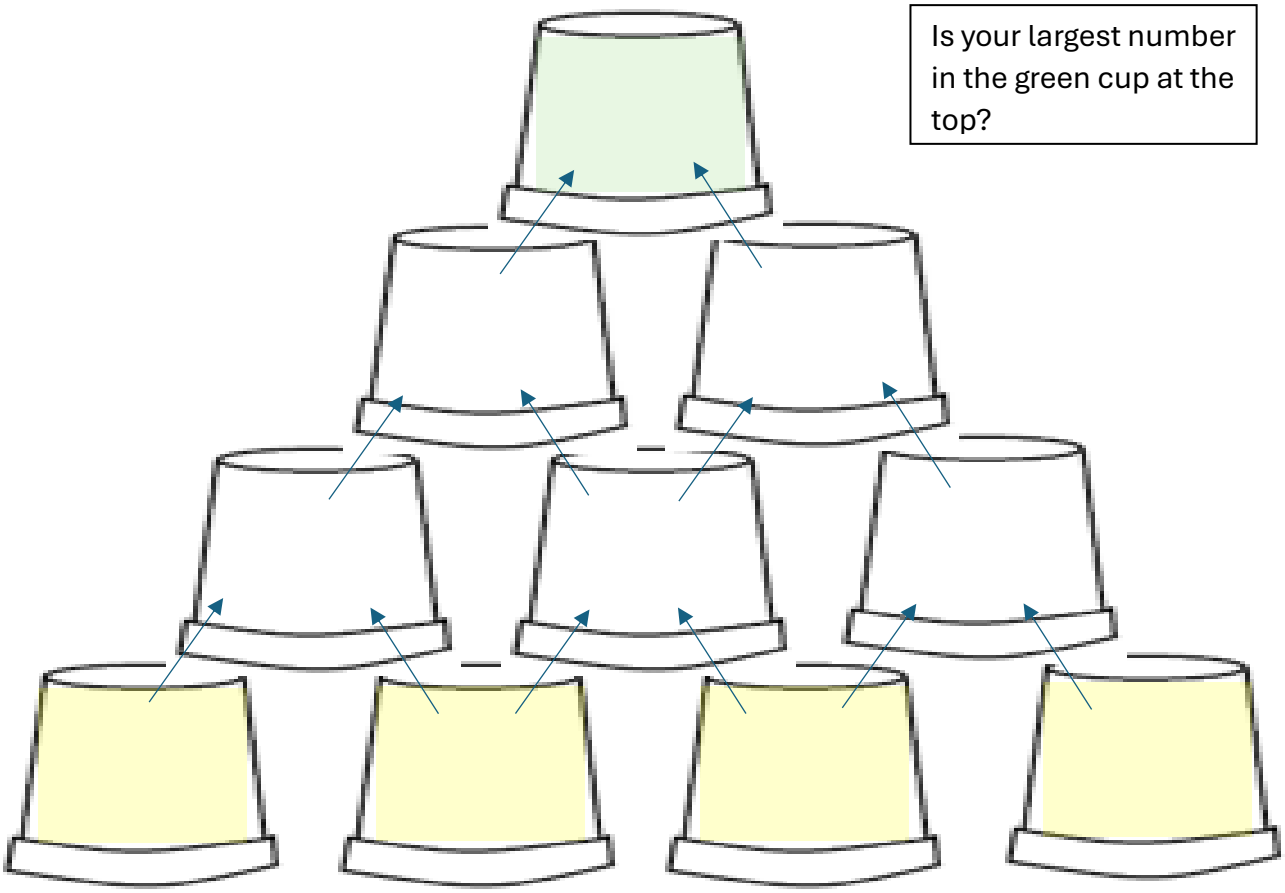
Make your own number pyramids

Roll one die and write the number in a yellow cup in the bottom row.

Roll the die three more times and record the numbers in the rest of the yellow cups in the bottom row.

Now add the numbers to make your pyramid to find the largest number in your pyramid.

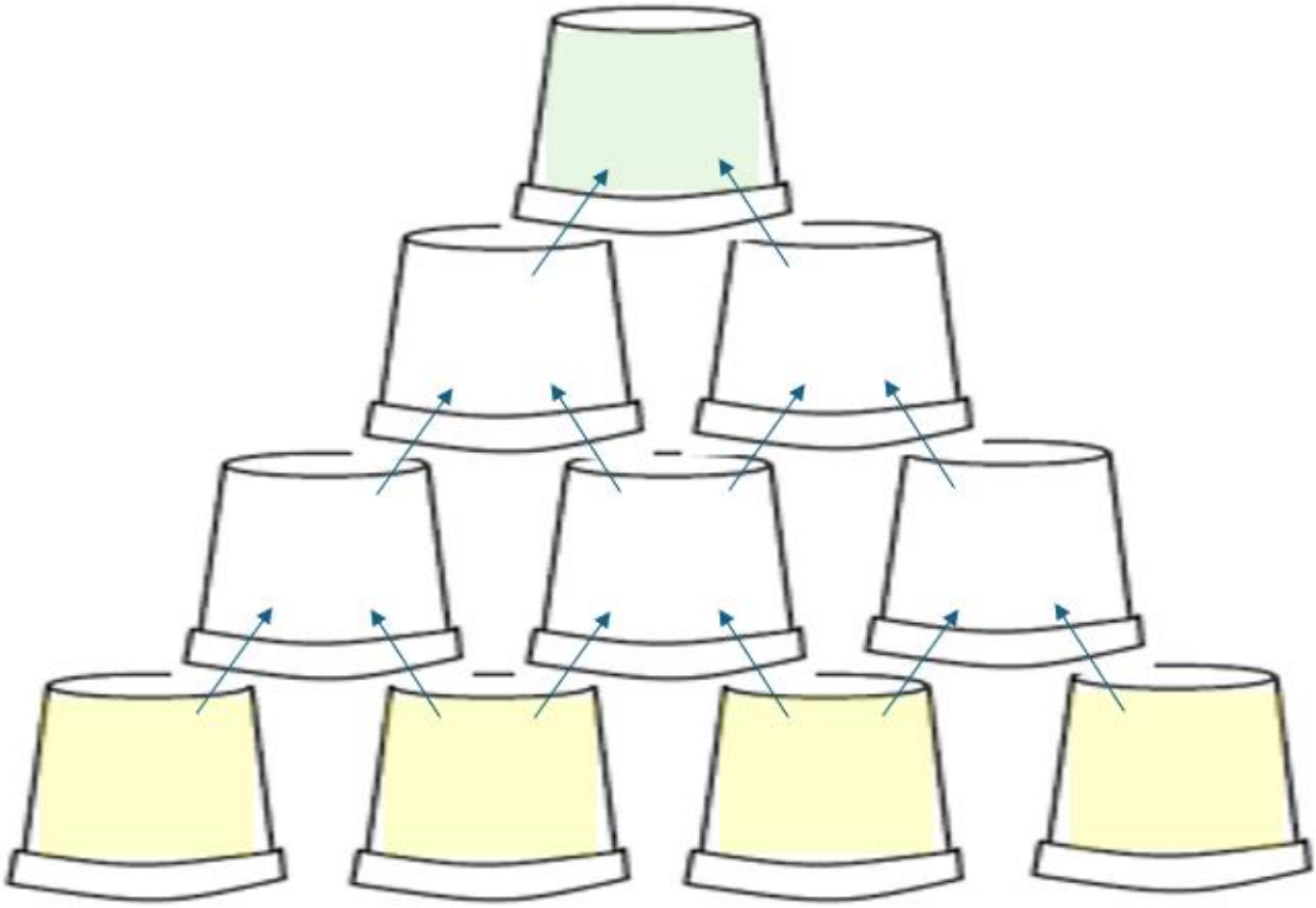
Is your largest number in the green cup at the top?



Use the space below for your working out or any notes.

Now try it again, this time with a more complex die (e.g. 40 sided) or use 2 dice for each roll to get your numbers for the four yellow cups in the bottom row.

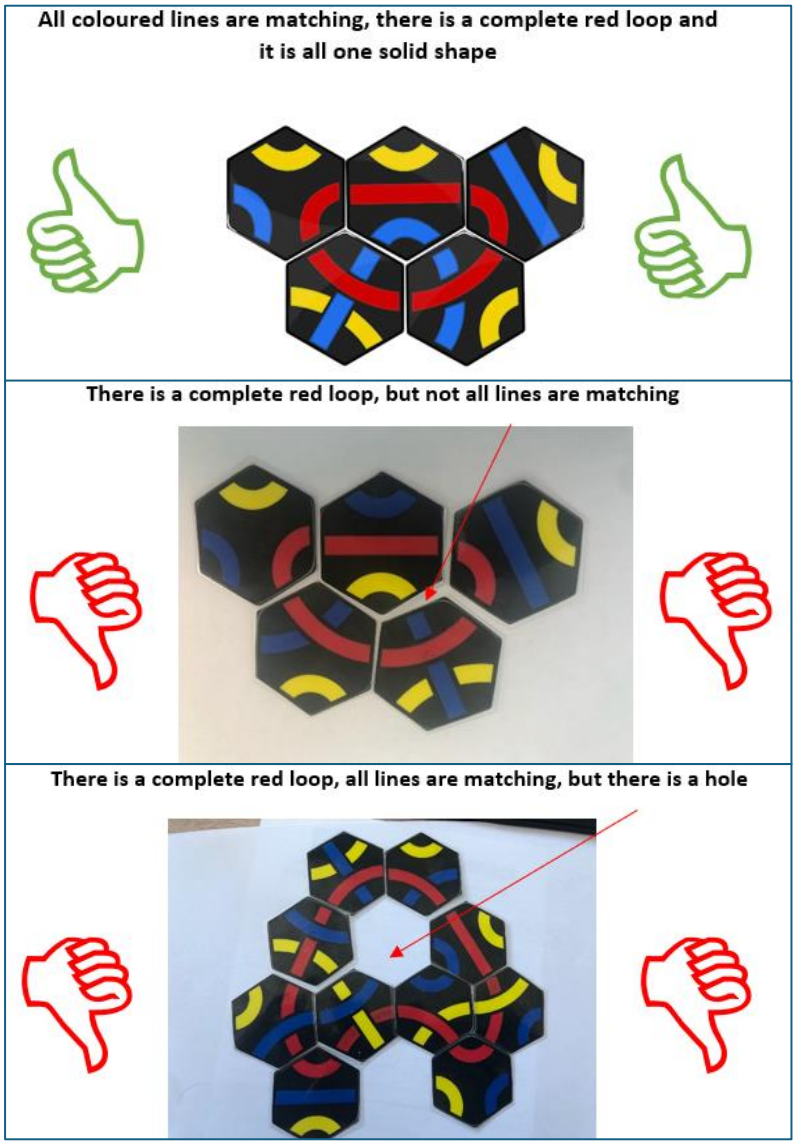
Add the numbers to find your new green cup value at the top. Record your results in the cup tower.



Use the space below for your working out or any notes.

Task 2 - Maths is not only about numbers

Now that you have solved some number puzzles, let's use maths skills without numbers. Mathematics is about finding patterns, using logic, and finding a different way of thinking. This puzzle uses graph theory, which is also used for working out train networks, social media networks, utility/power grids, supply chains and logistics.



See if you can make the tracks line up.

Your task is to make a continuous loop in the colour named on the back of the tile, using only the numbered tiles listed.

e.g. Tiles 1-5 Red Path

Here are the rules:

The colour of the loop must match the colour on the back of the tile with the highest number.

All coloured lines must match up, not just the main loop.

You must use all the tiles listed on the back of the highest number tile.

You can't have a hole in the middle.

How many tiles can you make a path with?

Tiles needed	1 to 3	1 to 4	1 to 5	1 to 6	1 to 7	1 to 8	1 to 9	All 10
Path Colour	Yellow	Red	Red	Blue	Blue	Blue	Yellow	Red
Teacher to sign/stamp here								

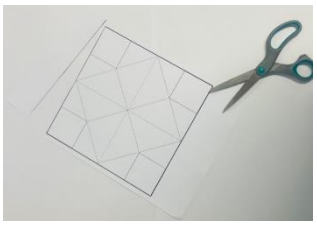
Extension – Try it yourself.

Make your own maths chatterbox

Constructing this device uses geometry and origami principles. NASA uses these same principles to fit tennis court-sized structures into tight rocket bays, so they can have large structures in space.

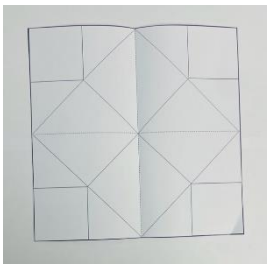
Make your own chatterbox and fill it with maths questions to solve.

1. Cut out the chatterbox.

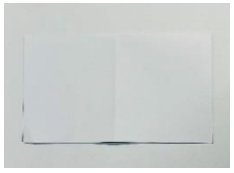


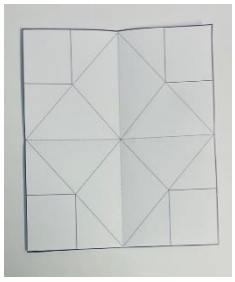
1. Fold the chatterbox in half along the dotted line and unfold again.



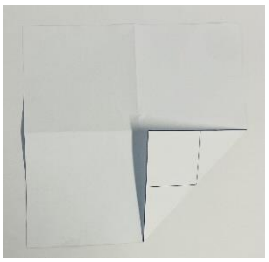


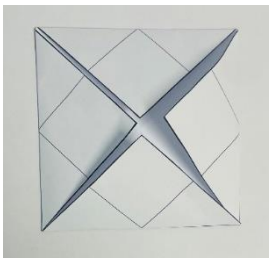
2. Fold the chatterbox in half again, along the other dotted line. Unfold then flip the page over so the white side is facing up.



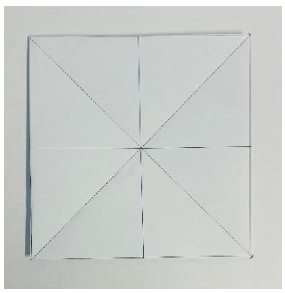


3. Fold all the corners in to meet in the middle.

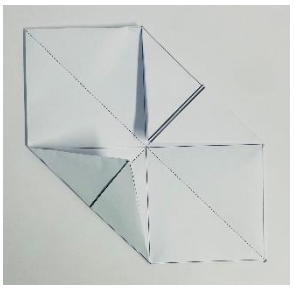


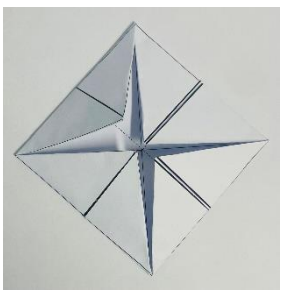


4. Flip the chatterbox back over so the lines are facing up.



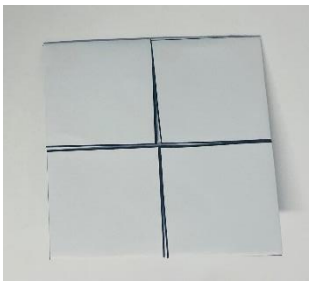
5. Fold the corners into the centre.

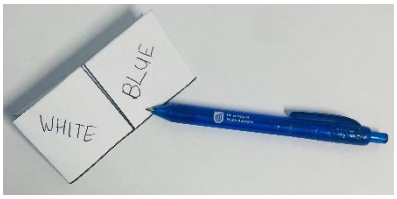




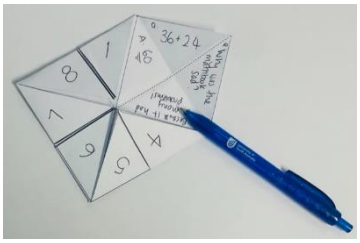
6. Flip back over so you can see four squares. Fold the chatterbox in half so there are two squares on each side. Label the outside squares with names of colours.







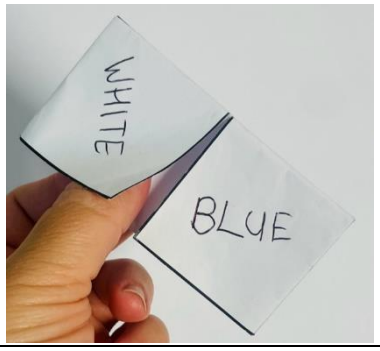
7. Label the inside triangles with numbers. Underneath each numbered flap write a maths question and answer

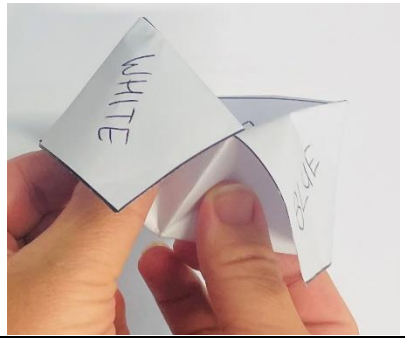


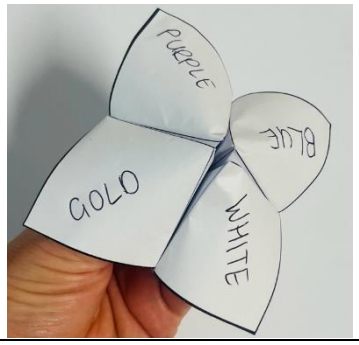
Here are some examples of maths questions (and answers) you can use, or you can come up with your own!

1. Multiply 7 x 5 (35)
2. What is half of 24? (12)
3. Round 87 to the nearest 10 (90)
4. What is 36 ÷ 6? (6)
5. Add 34 + 29 (63)
6. Subtract 50 – 17 (33)
7. What is the place value of the 4 in 452?(100)
8. True or False: 9 is a prime number? (False you can also divide it by 3)

8. Flip the chatterbox over and fold it in half, then slide your fingers into the pockets. Push out until the chatterbox looks like the one below.







How to Play:

1. A friend picks a colour from the outer flaps.
2. Move the chatterbox back and forth as many times as it takes to spell the colour chosen.
3. They choose a number from the inside flaps. Move the chatterbox as many times as the number chosen.
4. Choose a number again and this time open the flap and read the maths question.
5. If they answer correctly, they score a point.
6. How many points can they get before they get an answer wrong?

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Chatterbox Template

