RICH MATHEMATICAL TASK BOOKLET

ALGEBRA

YEAR 3

Copy Masters

Task 1

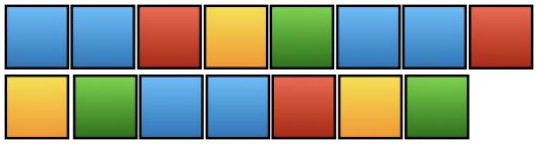
Litea has a giant bag of Skittles. She likes to eat her favourite colours of Skittles in a specific order: red, blue, green, yellow.

What colour will the 42nd Skittle that she eats be?

Find two different ways of solving the task and show representations to prove your solutions.

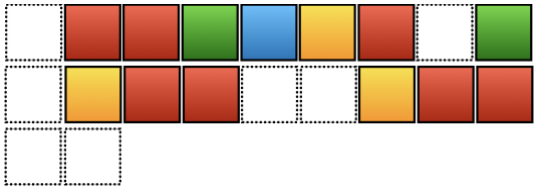
Task 1 (independent)

Tane is making a snake with cubes. This is his first snake:



Copy the pattern.
What is the unit of repeat? How many cubes in the unit of repeat?
How many cubes are there altogether?

Draw a picture of the snake and colour it.



What colours would the missing cubes be?

Tane continues making his pattern.

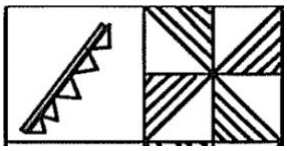
What colour would the 42nd block be?
What colour would the 50th block be?
What colour would the 104th block be?

What do you notice about all of the yellow blocks in relation to their pattern position?

What do you notice about all of the green blocks in relation to their pattern position?

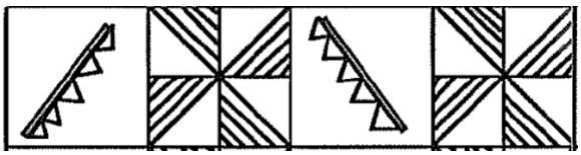
Task 2

Sesimani has been working on their tapa cloth design. She decided to use this pattern for the border.



Pattern 1

When she adds on to the border it looks like this:



Pattern 2

How many striped triangles are there for pattern one and two?
How many striped triangles would there be for pattern four?
How many striped triangles would there be for pattern 10?
If Sesimani wanted to make a long border, how many striped triangles would there by for pattern 50?
How does the pattern grow?

Task 2 (independent)

Litea has a giant bag of M & Ms. She likes to eat her favourite colours of M & Ms in a specific order: blue, yellow, green, red, orange.

What will the colour of the 41st M & M that she eats be?

Find two different ways of solving the task and use representations to prove your solutions.

What do you notice about all of the orange M & Ms in relation to their pattern position?

How could you find the location of every orange M & M?
What about the red M & Ms?

Task 3

At Te Oro the Siva Samoa group is learning a maulu'ulu. As part of the dance, they used these movements:

tap, tap, arm, arm, arm, arm, clap

They repeat these moves lots of times throughout the dance.

If they repeat the moves two times, how many taps would there be? How many arms would there be? How many claps would there be?

Complete the table below:

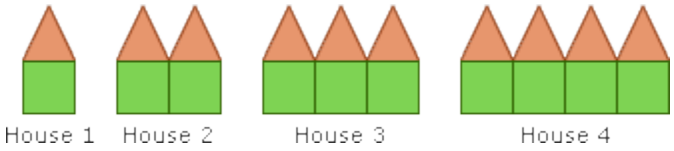
Number of movement sequence	Tap	Arm	Clap
1			
			2
		12	
4			
	10		
6			
			7
	16		

How many taps, arms, and claps would there be for 10 movement sequences?

How many taps, arms, and claps would there be for 20 movement sequences?

Task 3 (independent)

Use the shape blocks to copy this growing pattern:



Draw the pattern.
Draw the pattern for position 5.
Draw the pattern for position 10.

How is the pattern growing?

Use the shape blocks to copy this growing pattern:

Position 1 Position 2 Position 3

Draw the pattern.
Draw the pattern for position 5.
Draw the pattern for position 10.

How is the pattern growing?

Task 4

At Te Oro the Siva Samoa group is learning a maulu'ulu. As part of the dance, they used these movements:

tap, tap, arm, arm, arm, arm, clap

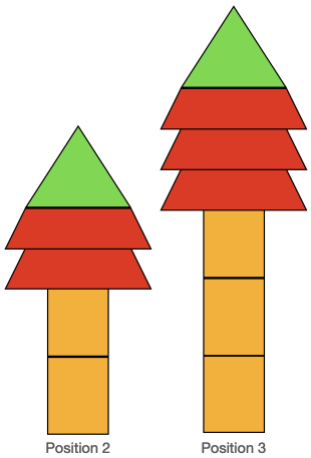
They repeat these moves lots of times throughout the dance.

Represent the pattern using different material.
Represent the pattern again using another type of material.

Create your own dance pattern.
Write an explicit series of steps for the movements for your dance pattern.
What is the unit of repeat for your pattern?

Represent your dance pattern using different material.
Represent the pattern again using another type of material.

Task 4 (independent)



Copy the pattern using the shape cards.

Build and draw Position 1.

Build and draw Position 4.

Build and draw Position 10.

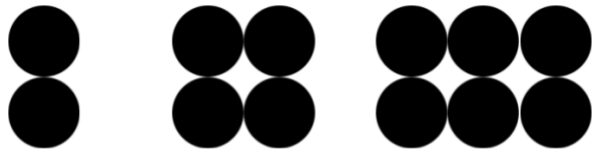
Complete the table

Position number	Number of rectangles	Number of quadrilaterals	Number of triangles	Total number of shapes
1				
2				
3				
4				
5				
6				
7				
8				

Identify three patterns going horizontally and three patterns going vertically.

What rules could you use to find the number of different shapes?

Task 5

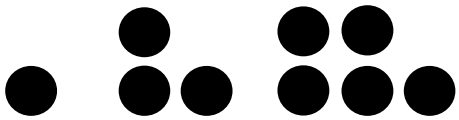


Position 1 Position 2 Position 3

How do you notice the pattern growing?
Use the counters to make position four and position five.
Represent the position number and number of dots in a table:

Position number	Number of dots

What is the rule for this pattern?
How would you make position 100?



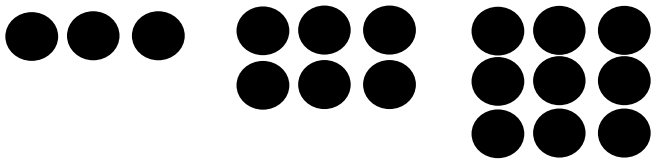
Position 1 Position 2 Position 3

How do you notice the pattern growing?
Use the counters to make position four and position five.
Represent the position number and number of dots in a table:

Position number	Number of dots

What is the rule for this pattern?
How would you make position 100?

Task 5 (continued)



Position 1 **Position 2** **Position 3**

How do you notice the pattern growing?
Use the counters to make position four and position five.
Represent the position number and number of dots in a table:

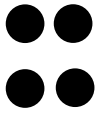
Position number	Number of dots

What is the rule for this pattern?

How would you make position 100?

Task 5 (independent)

Use the counters to make this growing pattern:



Add a row of four dots to the side each time.
Continue the pattern to position five.
What is the sequence for the number of dots? What is the rule for the pattern?

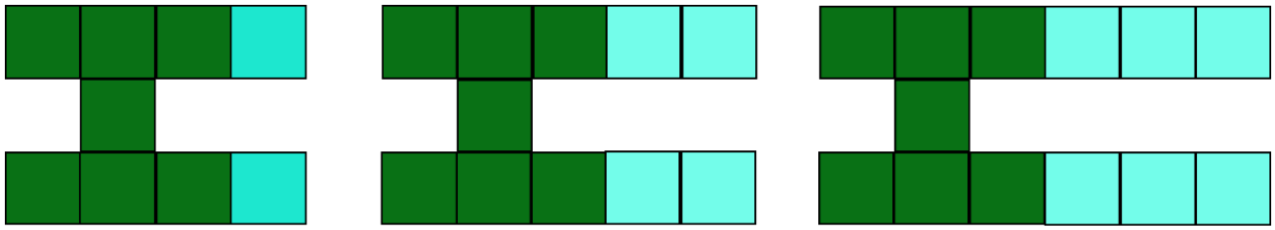
Use the counters to make this growing pattern:

Add three dots to the top each time.
Continue the pattern to position five.
What is the sequence for the number of dots? What is the rule for the pattern?

Use the counters to make your own growing patterns.
Continue the pattern to position five.
What is the rule for your growing pattern?

What growing patterns can you see around you?
Draw the growing patterns that you spot.

Task 6



Use the square tiles to make the pattern and continue this for position 4 and position 5.

Complete the table:

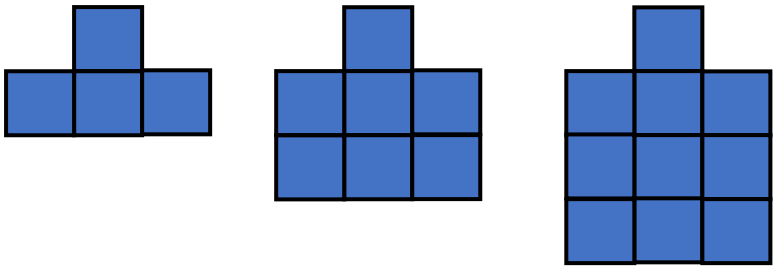
Position Number	Blue squares	Total number of squares
1		
2		
3		
4		
5		
6		

How many blue squares would Position 10 have?
How many squares would Position 10 have altogether?

How many blue squares would Position 20 have?
How many squares would Position 20 have altogether?

Describe how you would find the total number of squares for Position 50.

Task 6 (independent)



Position 1 **Position 2** **Position 3**

Use the square tiles to make the pattern and continue this for position 4 and position 5.

Complete the table:

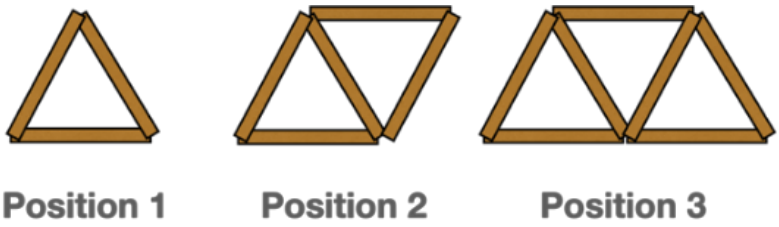
Position Number	Total number of squares
1	
2	
3	
4	
5	
6	

How many squares would Position 10 have?

How many squares would Position 20 have?

Describe how you would find the total number of squares for Position 50.

Task 7

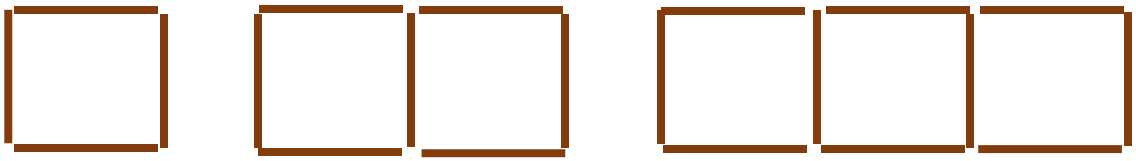


How many different patterns can you see in the picture?
Use colours and or number to show the different patterns.

How many sticks would position 4 have?
How many sticks would position 5 have?
How many sticks would position 10 have?

How many triangles would there be if there were 30 ice-block sticks?
Would there be any sticks left over?

Task 7 (independent)



Position 1 **Position 2** **Position 3**

How many different patterns can you see in the picture?
Use colours and or number to show the different patterns.

How many sticks would position 4 have?
How many sticks would position 5 have?
How many sticks would position 10 have?

How many triangles would there be if there were 30 ice-block sticks?
Would there be any sticks left over?

Task 8

In October, at the Flaxmere Community Garden, Anahera planted some tomato seeds in a pot. At the beginning of December, she put the tomato plant outside and also planted a bean seed in another pot.

After ten days, the bean plant was 1cm tall. The tomato plant was 38cm tall.

Anahera visited the community garden each afternoon to measure the plants. The next day the bean plant had grown 2cm more and every day it grew double the amount it had grown the day before.
The tomato plant grew at 5cm each day.

Complete the table:

Day									
Tomato									
Bean									

How many days would it take until the plants are the same height? How tall would they be?

Task 8 (independent)

The grape vine has grown the following length over 4 days after it has sprouted:

Day One	1 cm
Day Two	4 cm
Day Three	13 cm
Day Four	40 cm

What is the pattern for how it is growing?
What length will it be on day five?
What length will it be on day ten?

The passionfruit vine has grown the following length over 4 days after it has sprouted:

Day One	1 cm
Day Two	5 cm
Day Three	9 cm
Day Four	13 cm

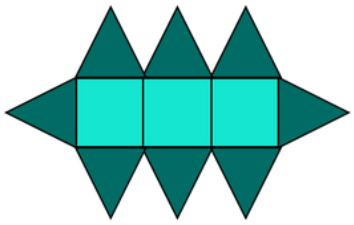
What is the pattern for how it is growing?
What length will it be on day five?
What length will it be on day ten?

The watermelon vine has grown the following length over 4 days after it has sprouted:

Day One	1 cm
Day Two	5 cm
Day Three	21 cm
Day Four	85 cm

What is the pattern for how it is growing?
What length will it be on day five?
What length will it be on day ten?

Task 9



Position 3

Use the counters to make Position 2, and Position 1

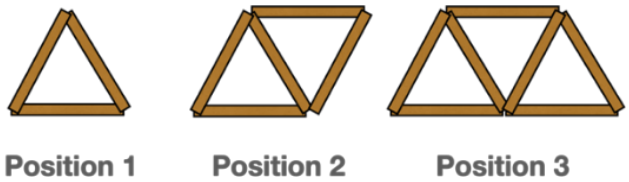
How many different patterns can you see? Explain these and justify them with colours, numbers, and the counters.

How many triangles would Position 4 have?
How many shapes would Position 4 have altogether?

How many triangles would Position 9 have?
How many shapes would Position 9 have altogether?

Describe how you would find the number of triangles for Position 51.

Task 9 (independent)



What position number would have 41 sticks?

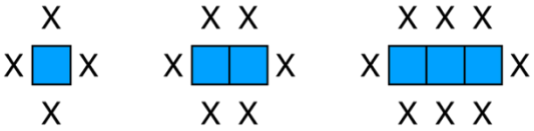
What position number would have 105 sticks?

If there were 208 sticks, how many triangles would there be? Would there be any sticks left over?

Task 10

You are having a birthday party at a hall and need to help set the tables up so everyone will fit.

The first three tables look like this:



How many people could sit around four tables?

How is the pattern growing?
Use drawings and numbers to show how it is growing.

How many people could sit around 6 tables?
How many people could sit around 9 tables?
How many people could sit around 12 tables?

How could you find out how many people could sit around 50 tables?