

Task 3 - Growing Patterns

Starter

Using any combination of +, -, x, ÷ and (), make a total of 24 with each of the given sets of numbers. The numbers do not have to be kept in their original ascending order.

Using each number only once

1 2 3 4



1 2 5 6

1 5 6 9



2 3 6 7

1 2 3 6

5 5 9 9



1 2 8 9

1 2 3 5

1 2 7 9



1 4 7 7

Task 1

Use what you already know about sequences, and the internet, to find definitions for the following:

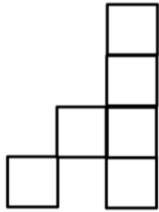
Term-to-term rule

Position-to-term rule

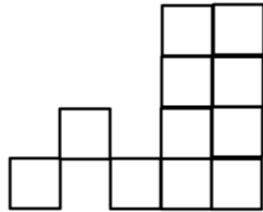
Task 2

A sequence of diagrams begins with these 2 images.

1



2



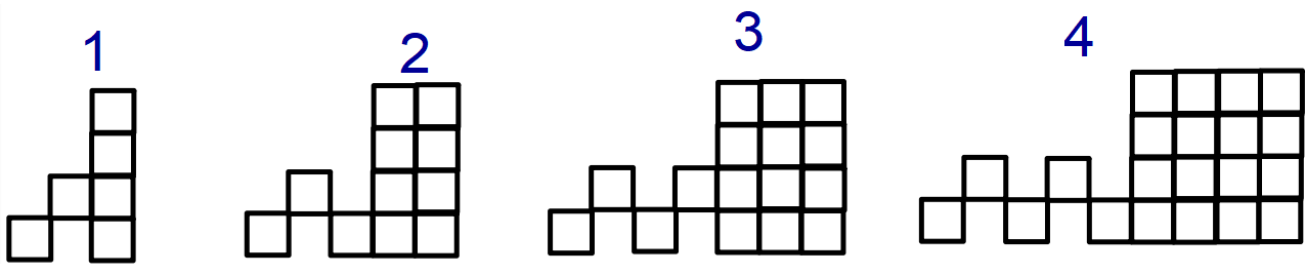
a) Explain what changes from diagram 1 to diagram 2:

b) The pattern continues on. Draw the next 2 diagrams in the sequence.

c) What stays the same each time?

d) What is added or changes each time?

Task 3



Underneath each pattern, write the number of squares it is made of. For example, pattern 1 is made of 6 squares.

a) What do you notice? How can we link this to our times tables?

b) How many squares will the 10th pattern have?

c) How many squares will the 210th pattern have?

d) Which pattern will have 36 squares?

Review

Looking back at the term-to-term rule, try to find the term-to-term rules for the following patterns:

- 1) $\triangle + 1, \triangle + 2, \triangle + 3, \triangle + 4, \dots$
- 2) $\square - 3, \square - 6, \square - 9, \square - 12, \dots$
- 3) $\circ, 3\circ, 9\circ, 27\circ, \dots$
- 4) x, x^2, x^3, x^4, \dots
- 5) x, xp, xp^2, xp^3, \dots
- 6) $x - 1, 3(x - 1), 9(x - 1), \dots$
- 7) $3x, 4x, 5x, 6x, \dots$

Focus on what is changing each time.

