

Patterns

CAPS: Grade 6, Term 3

Patterns, Functions and Algebra

Input and output values: Determine input values, output values and rules for patterns and relationships using flow diagrams.

Note

Remember:

There are often relationships between numbers. These relationships often represent a real-life trend or pattern.

E.g.

x	1	2	3	4	5	6	7
$2x$	2	4	6	8	10	?	?

You know the next two numbers in the bottom sequence will be 12 and 14. How did you know this?

You probably noticed that the bottom row of numbers is increasing in 2s. While this could just be a number sequence it could also represent a real-life trend or pattern, perhaps the number of eyes per person. That means if I asked how many eyes 52 people would have, you wouldn't count from the beginning of the sequence, you would have seen a relationship between the top and bottom rows. 1 person has 2 eyes, 2 people have 4 eyes, 3 people have 6 eyes altogether etc.

This can be shown as an x amount of people multiplied by 2 will give me the answer of how many eyes the number of people have i.e. $2x$.

E.g. 52 people have (52×2) eyes = 104 eyes altogether.

Activity 1

① Look at the pictures below made with sticks.



Ⓐ Draw the next picture in the pattern.



- (b)** Draw the sixth picture in the pattern.

- (c)** Complete the table below which shows the number of sticks being used for each picture.

Picture number	1	2	3	4	5	6	7	8	10	12
Number of sticks	4	7	10							

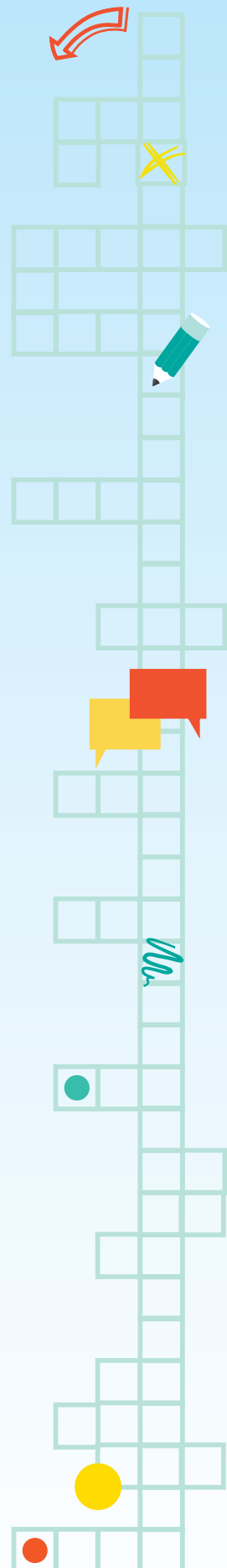
- (2)** A method of calculating the amount of sticks needed for each picture is as follows. Complete the number sentences. Can you see how the number sentences are linked to the pictures?

Picture 1	$(1 \times 3) + 1 = 4$
Picture 2	$(2 \times 3) + 1 = 7$
Picture 3	$(3 \times 3) + 1 = \underline{\hspace{2cm}}$
Picture 4	$(\underline{\hspace{2cm}} \times 3) + 1 = \underline{\hspace{2cm}}$
Picture 5	$(\underline{\hspace{2cm}} \times 3) + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$
Picture 6	$(\underline{\hspace{2cm}} \times 3) + 1 = \underline{\hspace{2cm}}$
Picture 10	$(10 \times 3) + 1 = \underline{\hspace{2cm}}$
Picture 12	$(\underline{\hspace{2cm}} \times 3) + 1 = \underline{\hspace{2cm}}$

- (3)** Without having to draw the pictures, work out using the number sentence in number 2, how many sticks will be needed for the following pictures.

(a) Picture 20 .

(b) Picture 25 .

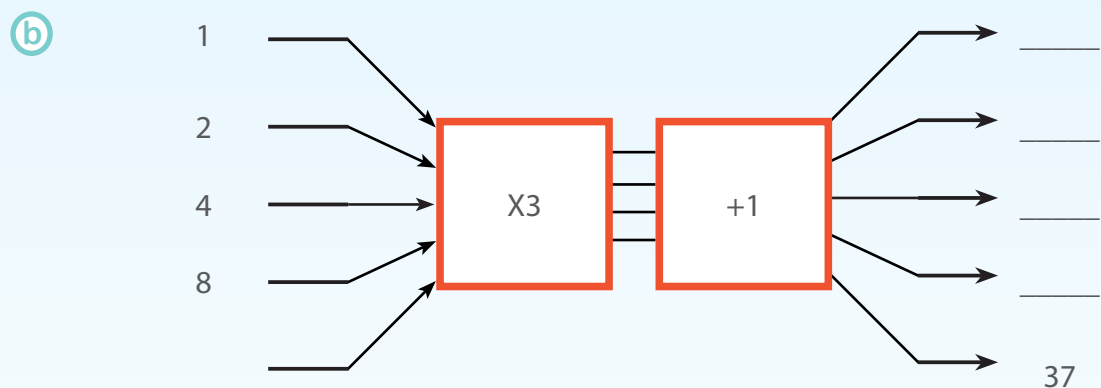
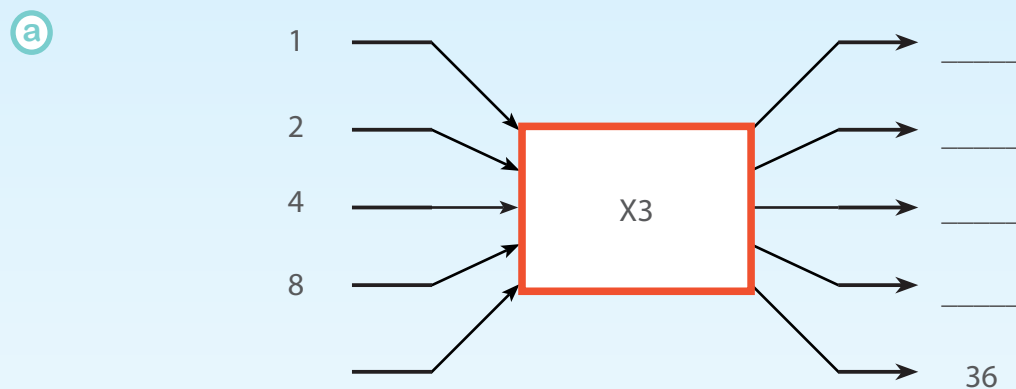




- c Picture 31 _____
- d Picture 40 _____
- e Picture 50 _____
- f Picture 52 _____
- g Picture 63 _____
- h Picture 90 _____
- i Picture 120 _____
- j Picture 230 _____

Activity 2

1 Complete the following flow diagrams



Teacher Tip

Allow learners to physically build the patterns with matches or sticks. Spend time on getting learners to explain what they notice when building the patterns and what the relationships are between the pictures, table of values and flow diagrams. The flow diagrams also show how the order of operations affects the answers. Talk about this.

