NUMBER PATTERNS

- A list of numbers that follow a rule is called a **number pattern** or a **sequence**. For example: 4, 7, 10, 13, …
- Each separate number in the sequence is called a **term**.
- In the example above, the 4th term is 13. The rule 'start with 3 and add 2 to each term' gives 3, 5, 7, 9, 11, …
- To find the pattern rule for a sequence, ask:
  - Are the terms increasing or decreasing by a fixed amount?

  - Are the terms being multiplied or divided by the same amount?

NUMBER PATTERNS

6, 18, 30, 42, …

99, 92, 85, 78, ….

2, 6, 18, 54, ….

256, 128, 64, 32, …

3, 5, 8, 12, …

3, 8, 13, 18, …

5, 10, 20, 40, …

14, 100, 20, 80, 26, 60, ….

1, 4, 9, 16, 25, …

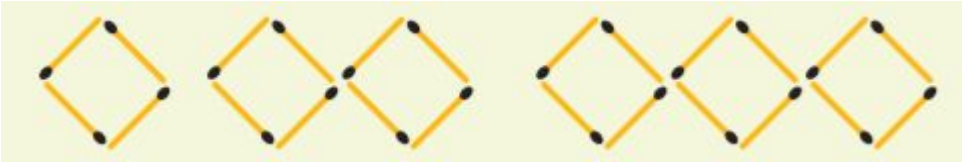
1, 1, 2, 3, 5, 8, 13, 21, 34, 55, … (Fibonacci)

1, 2, 3, 5, 7, 11, 13, 17, 19, 23, … (primes)

SPATIAL PATTERNS

A spatial pattern is a sequence of geometrical shapes.

example



A table of values shows the number of shapes and the number or sticks.

Number of squares	1	2	3	4	5
Number of sticks	4	8	12	16	20

A pattern rules shows how many sticks are needed for a certain number of shapes:

example: Number of sticks $= 4 \times$ number of shapes

SPATIAL PATTERNS

If designs connect with an edge, the repetitive shape added on will be a subset of the original design, as the connecting edge does not need to be repeated.

example

SPATIAL PATTERNS - EXAMPLE

a Draw the next two shapes in this spatial pattern.

b Copy and complete the table.

Number of crosses	1	2	3	4	5
Number of sticks required					

c Describe a rule connecting the number of sticks required to the number of crosses produced.

d Use your rule to predict how many sticks would be required to make 20 crosses.

TABLES AND RULES

From the table of values, we can figure out a rule describing the relation between two varying quantities.

Number of squares	1	2	3	4	5
Number of sticks	4	8	12	16	20

Number of sticks = 4 × Number of squares

More generally, we talk about "input" and "output".

example:

for the table:

Input	1	2	3	4	5	6
Output	6	7	8	9	10	11

Output = Input + 5