Maths - Year 6

Pattern and Algebra 2: Exploring number sequences and relationships

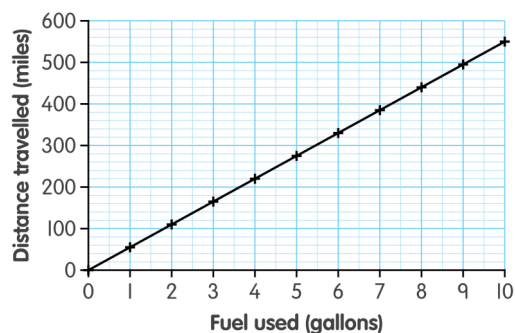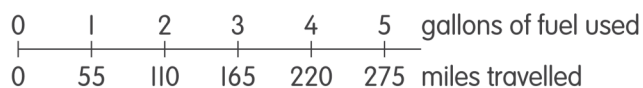### Key Vocabulary

Sequence	An ordered list of numbers, shapes or objects.
Term	One of the numbers in a sequence.
Interval	The distance between two points or the numbers between two values.
Formula	A mathematical relationship or rule expressed in symbols.
Expression	A combination of numbers, variables and function e.g. 2n + 6
Algebra	The part of mathematics in which letters and other general symbols are used to represent numbers and quantities in formulae and equations.
Linear	Progressing from one stage to another in a single series of steps; sequential.
Gradient	The rate of an incline.
Ordinal numbers	First, second, third etc.
Square number	The product of multiplying a number by itself.

Mathematical Skills

- Identify and use a constant difference to continue a linear sequence.
- Draw a line graph to illustrate a linear relationship between variables.
- Explain how a constant difference in a linear sequence relates to a line graph for the sequence.
- Describe and begin to explain relationships in the digits or terms of a number sequence.
- Work systematically to explore number sequences and find patterns from which they can identify general rules.
- Write a general rule for finding any term in a number sequence by using letters to stand for numbers.

Mathematical Methods

- Exploring links between linear sequences, rates and straight-line graphs e.g. Jed's car will use between 4 and 5 gallons of fuel to cover 250 miles. Jed wants to estimate the amount of fuel he will used on his 605 mile journey.

0	1	2	3	4	5	gallons of fuel used
0	55	110	165	220	275	miles travelled

550	55	605

$550 ÷ 55 = 10$ $55 ÷ 55 = 1$ $605 ÷ 55 = 11$

- Exploring patterns in decimal number sequences e.g.
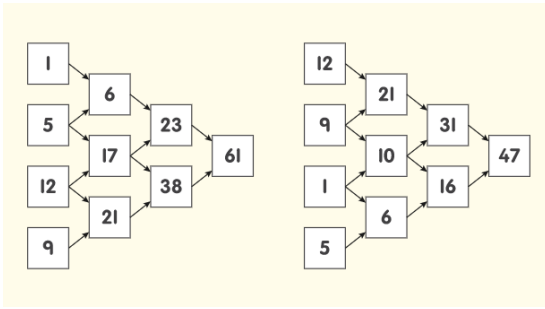
100·0, 101·1, 102·2, 103·3, 104·4, 105·5, 106·6, 107·7, 108·8, 109·9, …

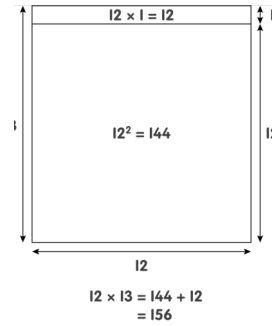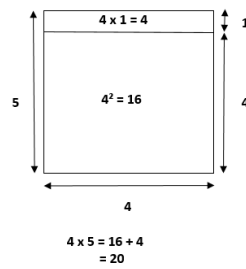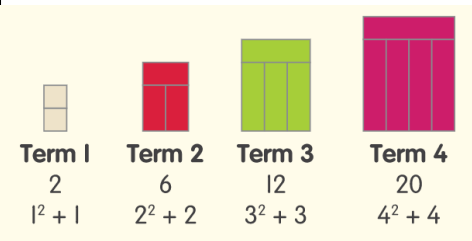101·0, 99·9, 98·8, 97·7, 96·6, 95·5, 94·4, 93·3, 92·2, 91·1, …

- Investigating number chains e.g.

27 → 82 → 41 → 124 → 62 → 31 → 94 → 47 → 142 → 71 → 214 → 107 → 322 → 161 → …

- Investigating arrow diagrams.

- Describing growing patterns e.g. work out the 12th term in a sequence and express this algebraically.

Term 1	Term 2	Term 3	Term 4
2	6	12	20
$1^2 + 1$	$2^2 + 2$	$3^2 + 3$	$4^2 + 4$

$4 \times 1 = 4$ 1
$4^2 = 16$ 4
5
4
$4 \times 5 = 16 + 4$
$= 20$

$12 \times 1 = 12$ 1
$12^2 = 144$ 12
1
12
$12 \times 13 = 144 + 12$
$= 156$

$$n \times (n + 1) = n^2 + n$$

Can you..?

- Kriti's car travels approximately 62 miles for each gallon of fuel.

  How far will she travel if she uses 2 gallons, 4 gallons or 8 gallons of fuel?

  Can you write a general rule for the distance travelled for any amount of fuel?