

S-Plan

Congratulations! You have discovered our small-step maths planning (or S-plan for short).



What Is an S-Plan?

Our small-step maths planning documents, available from EYFS+, are carefully structured, breaking each mathematical concept into progressive, smaller steps of learning and identifying points in learning where possible misconceptions will need to be addressed. Links to all planning, assessments and engaging activities are provided. Our sessions are ideal for whole-class teaching, group interventions and 1:1 tuition sessions for students who simply need that extra boost to reach their potential.

Did You Know...?

Our assessments, lesson planning and interventions are all linked into our small-step plans. This ensures that you have everything you need to teach at the

Baseline
Assessment

Main Teaching



Same-Day
Interventions

End-of-Strand
Assessment

Short and
purposeful



Related to the DfE
Ready-to-
Progress Criteria



Devised to fit into
your school day



Clear picture of
your students'
understanding

All in one
document

Created by maths
specialists and
experienced
teachers to help
students to 'keep
up' not 'catch up'.

Algebra

End-of-Strand Assessment

Name: _____ Date: _____

1. a) Fill in the missing numbers in this sequence.

84 76 68

- b) What would be the tenth term of this sequence?

2 marks

2. You can calculate how much distance a car has travelled by multiplying the speed it travels by the time it takes.

$$\text{distance} = \text{speed} \times \text{time}$$



Use the formula to complete the missing values in the table below.

Speed	Distance	Time
60 mph	<input type="text"/> miles	2 hours
45 mph	<input type="text"/> miles	5 hours
<input type="text"/> mph	280 miles	8 hours
50 mph	225 miles	<input type="text"/> hours

2 marks

3. Calculate the value of each letter in the formulae.

$$40 = 5a$$

$$a = \boxed{}$$

$$7b = 84$$

$$b = \boxed{}$$

$$58 = 6c - 2$$

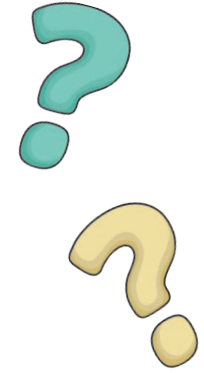
$$c = \boxed{}$$

$$6d + 13 = 25$$

$$d = \boxed{}$$

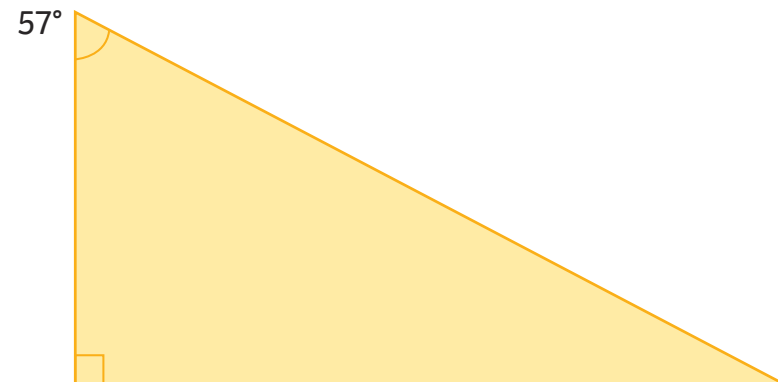
$$35 = 6e + e$$

$$e = \boxed{}$$



2 marks

4. Complete the formula to express the total of the angles in this triangle. Use an x to represent the unknown angle.



Formula: + + =

1 mark

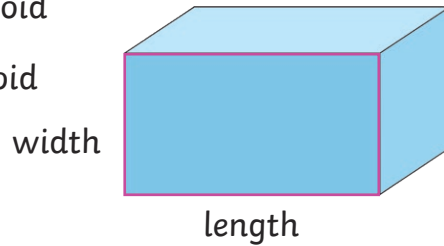
5. Vasi measures around the edges of one face of a cuboid to find its perimeter.

He calculates it using this formula:

$$w + l + w + l$$

w : the width of the cuboid

l : the length of the cuboid



- a) What is this formula in its simplest form?

- b) The cuboid has 6 faces in total. 2 of the faces are squares. What is the formula for the total length of all the edges of the cuboid?

2 marks

6. 4 friends correctly calculated their average height by adding the height of each child together and then dividing the total by the number of children.

In the box below, write a formula for their calculation. Use b , c , d and e to represent the heights of the 4 children and A to represent the average height.

- 6'6"
- 6'3"
- 6'0"
- 5'7"
- 5'4"
- 5'1"
- 4'8"

1 mark

7. In this equation, a and b represent whole numbers.

Complete the table to find all possible pairs of values for a and b .

$$6 = 18 - ab$$

a	b

2 marks

8. In this equation, c and d are both whole numbers which are below 10.

$$c = d \div 3$$

Write all of the calculations showing the possible values of c and d .

2 marks

9. Circle the formula that could be used to describe this number sequence.

p represents the previous number in the sequence

2 5 11 23 47

$p \div 2 + 4$

$3p - 4$

$2p + 1$

1 mark



10. a) Use the formula below to calculate the value of each letter.

$a + b = 11$

$ab = 30$

$b < a$

$c > d$

$c \div d = 3$

$c - d = 6$

$a =$

$b =$

$c =$

$d =$

- b) If e represents 4, complete this formula using only letters and symbols.

$f + 4 = e$

2 marks

11. To create perfect bows for her kite, Gina has decided to make them increasingly larger towards the end of the string.

Use this formula to calculate how many centimetres of ribbon she needs for each bow.

n represents the number of the bow that is being tied

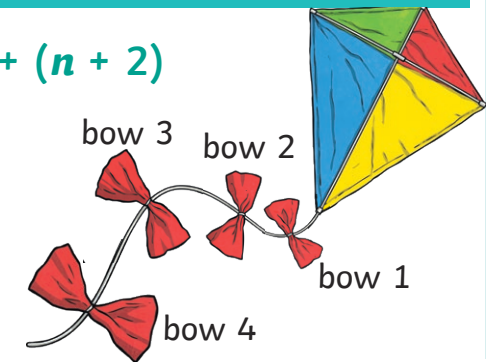
bow 1: cm

bow 2: cm

bow 3: cm

bow 4: cm

$$5n + (n + 2)$$



2 marks

12. Draw lines to match the numbers in the sequence to the formula that could represent them.

13

17

21





25




$5(3 + 2)$ $3 \times 5 - 2$ $50 \div 2 - 4$ $(2 \times 8) + 1$

2 marks

13. In the formulae below, **a** represents 4 and **b** represents 6. Calculate the value of each of the shapes.

$2a =$   $= \frac{(a + b)}{2}$

   $= b +$ 

 $=$  $=$  $=$



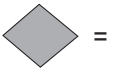
2 marks

Total
23 marks

		Answer	Assessment Focus	Possible Misconceptions and Interventions															
1.	2 marks 1 mark for a) 1 mark for b)	a) 84 76 68 60 52 44 b) 12	Generate linear number sequences	Children may struggle to find the difference between adjacent numbers in a sequence to determine the pattern. They may find it difficult to apply the formula for the number sequence and continue it. Children may not understand what is meant by the tenth term of a number sequence.															
2.	2 marks 1 mark for two or three correct answers 2 marks for four correct answers	<table border="1"> <thead> <tr> <th>Speed (miles per hour)</th> <th>Distance (miles)</th> <th>Time (hours)</th> </tr> </thead> <tbody> <tr> <td>60 mph</td> <td>120 miles</td> <td>2 hours</td> </tr> <tr> <td>45 mph</td> <td>225 miles</td> <td>5 hours</td> </tr> <tr> <td>35 mph</td> <td>280 miles</td> <td>8 hours</td> </tr> <tr> <td>50 mph</td> <td>225 miles</td> <td>4.5 hours</td> </tr> </tbody> </table>	Speed (miles per hour)	Distance (miles)	Time (hours)	60 mph	120 miles	2 hours	45 mph	225 miles	5 hours	35 mph	280 miles	8 hours	50 mph	225 miles	4.5 hours	Use simple formulae	Children may not understand the use of formulae in real-life contexts and may be unsure of how to find the answers. They may not know how to relate the formula given to the other given values. Children may be unable to use inverse operations to calculate missing values when speed or time values are missing. They may struggle with division calculations that produce a decimal answer.
Speed (miles per hour)	Distance (miles)	Time (hours)																	
60 mph	120 miles	2 hours																	
45 mph	225 miles	5 hours																	
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50 mph	225 miles	4.5 hours																	
3.	2 marks 1 mark for three or four correct answers 2 marks for all five correct answers	$a = 8$ $b = 12$ $c = 10$ $d = 2$ $e = 5$	Use simple formulae	Children may be unsure of some of the symbols or conventions used in formulae, e.g. what a number followed by a letter means. They may misunderstand what the equals sign means. Children may struggle to follow a formula involving more than one operation.															
4.	1 mark	$90^\circ + 57^\circ + x^\circ = 180^\circ$ ($90^\circ + 57^\circ + x^\circ$ in any order)	Use symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as angles	Children may not know that all the internal angles of a triangle add up to 180° and that the symbol shown represents 90° . They may not be able to express the values of the angles and the total of the angles in a formula, including the unknown angle represented by a letter.															

		Answer	Assessment Focus	Possible Misconceptions and Interventions								
5.	2 marks 1 mark for a) 1 mark for b)	a) $2w + 2l$ (or $2l + 2w$) b) $8w + 4l$ (or $4l + 8w$)	Use symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as equivalent expressions	Children may not understand the term 'simplest form' or may be unsure of how to express a formula this way. They may find it challenging to use given letters to represent unknown lengths and apply it to the context. Children may struggle to use their understanding of the properties of shapes to write the formulae.								
6.	1 mark	$\frac{(b + c + d + e) = A}{4}$	Express missing number problems algebraically Use symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as formulae in mathematics and science	Children may find it difficult to apply their algebra knowledge in a real-life context. They may struggle to express a calculation in the form of a formula, especially one with several steps. Children may be unsure of some of the symbols or conventions used in formulae, e.g. how to use brackets to show the first stage of the calculation to be completed. They may misunderstand what the equals sign means.								
7.	2 marks 1 mark for two pairs 2 marks for all three pairs	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">a</td> <td style="text-align: center;">b</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">12</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">6</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> </table> <p>Each pair can be expressed either way round.</p>	a	b	1	12	2	6	3	4	Find pairs of numbers that satisfy an equation with two unknowns	Children may be unsure of some of the symbols or conventions used in formulae, e.g. that two letters next to each other in a formula represent a multiplication of those two values. They may not know the relevant multiplication facts and may misunderstand what the equals sign means, not knowing that the value on either side is of equal value.
a	b											
1	12											
2	6											
3	4											
8.	2 marks 1 mark for two calculations 2 marks for all three calculations	$3 = 9 \div 3$ $2 = 6 \div 3$ $1 = 3 \div 3$	Enumerate possibilities of combinations of two variables	Children may not know how to interpret the formula. They may be unable to use the inverse operations and appropriate multiplication facts to help them.								

		Answer	Assessment Focus	Possible Misconceptions and Interventions
9.	1 mark	$2p + 1$	Describe linear number sequences Use symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as generalisations of number patterns	Children may be unsure of some of the symbols or conventions used in formulae, e.g. that two letters next to each other in a formula represent a multiplication of those two values. They may not understand how to use the previous number in the sequence in the formula or may become confused with the larger numbers.
10.	2 marks 1 mark for a) 1 mark for b)	a) $a = 6$ $b = 5$ $c = 9$ $d = 3$ b) $f + 4 = e + f$	Use symbols and letters to represent variables and unknowns in equivalent expressions (for example, $a + b = b + a$) and number puzzles (for example, what two numbers can add up to)	Children may be unsure of some of the symbols or conventions used in formulae. They may find it difficult interpreting multiple formulae with the same unknown values. Children may struggle to understand the commutative property of addition remains even when some values are unknown.
11.	2 marks 1 mark for two or three correct answers 2 marks for all four correct answers	Bow 1: 8cm Bow 2: 14cm Bow 3: 20cm Bow 4: 26cm	Generate linear number sequences Use symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as lengths	Children may struggle to apply their algebra understanding to this real-life context. They may be unsure of some of the symbols or conventions used in formulae, e.g. brackets and a number followed by a letter. Children may not be able to use the given numbers to calculate accurately, using mental methods, especially as there are multiple steps of calculations.
12.	2 marks 1 mark for two or three correctly matched 2 marks for all four correctly matched	<p>13 17 21 25</p> <p>$5(3 + 2)$ $3 \times 5 - 2$ $50 \div 2 - 4$ $(2 \times 8) + 1$</p>	Use simple formulae Describe linear number sequences	Children may be unsure of some of the symbols or conventions used in formulae. They then may not be able to correctly interpret them and relate them to the given numbers.

		Answer	Assessment Focus	Possible Misconceptions and Interventions
13.	2 marks 1 mark for two correct answers 2 marks for all three correct answers	 = 8  = 5  = 3	Use symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as number puzzles	Children may be unsure of some of the symbols or conventions used in formulae. They may be unable to correctly interpret symbols and relate them to given numbers. Children may find it difficult to use their understanding of different operations and inverses to calculate missing numbers.