

Year 6 Maths Assessment: Algebraic Thinking

Learning objective: To express missing number problems algebraically, find pairs of numbers that satisfy an equation with two unknowns, and enumerate possibilities of combinations of two variables.

Read each question carefully. Show your working out clearly, as marks are awarded for the process even if the final answer is incorrect. Ensure you use the correct units where applicable.

Max the monkey is organising his fruit collection. He uses simple equations to keep track of his snacks. He knows that a banana costs £0.20 and an apple costs £0.30. He also uses algebra to solve puzzles about his treehouse height and the number of leaves he collects.

Word bank: Algebra · Variable · Equation · Expression · Coefficient · Unknown · Substitution · Formula

1. Max has an expression: $3a + 5$. If 'a' represents 4, calculate the value of the expression. Show your working. (2 marks)

2. Pip the caterpillar writes the equation: $x + y = 12$. List three possible pairs of whole numbers for x and y. (3 marks)

3. Kit the fox uses the formula $P = 4s$ to find the perimeter (P) of a square with side length (s). If the side length is 7cm, what is the perimeter? If the perimeter is 32cm, what is the side length? (4 marks)

4. Ellie the elephant buys some stickers. Each pack costs £1.50 and she has a delivery fee of £2.00. Write an algebraic formula to calculate the total cost (T) for any number of packs (p). (4 marks)

5. Nova the owl is looking at star patterns. She says, 'If I have two variables, b and c , where $2b + c = 10$, find all possible positive whole number solutions for b and c .' List them clearly. (4 marks)

6. Write a short paragraph explaining to a Year 5 student why we use letters in algebra instead of empty boxes or question marks. Include an example of a simple equation and explain how you would solve for the unknown. (5 marks)

Draw: Draw a representation of the equation $2x = 6$ using two groups of objects to represent the $2x$ and six individual items to represent the total.



Extension challenge: Total: /25