Subject	Year	Month
Mathematics	7	January

Topic:

INTRODUCTION TO ALGEBRA — 6 LESSONS

Content (Intent)

Prior Learning

Key Stage 2:

- Use symbols (including letters) to represent missing numbers
- Substitute numbers into worded formulae
- Substitute numbers into simple algebraic formulae
- the order of operations

Future Learning

Later in Y7:
Solve linear equations
Expand double brackets

Y8 : Factorise expressions

Objectives

- Know the meaning of expression, term, formula, equation, function (variable, coefficient, …)
- Know and use basic algebraic notation (the 'rules' of algebra)
  - Hidden multiplication symbol
  - Hidden coefficient 1
  - Fraction instead of division symbol
  - Coefficient in front of the variable
  - Use of powers and brackets
    - ✓ *difference between t + t and t x t*
    - ✓ *difference between $(3x)^2$ and $3x^2$*
- Simplify a simple expression by collecting like terms
- Simplify more complex expressions by collecting like terms
- Expanding brackets
  - Multiplying an integer over a bracket
  - Multiplying a single term over a bracket
- Substitute positive and negative values into expressions and formulae

For teaching purposes

POSSIBLE QUESTIONS

- Show me an example of an expression / formula / equation
- Always / Sometimes / Never?
  - 4(g+2) = 4g+8
  - 3(d+1) = 3d+1
  - $a^2 = 2a$
  - ab = ba
- Jenny writes 2a + 3b + 5a – b = 7a + 3. Kenny writes 2a + 3b + 5a – b = 9ab. What would you write? Why?

POSSIBLE MISCONCEPTIONS

- may think that it is always true that a=1, b=2, c=3, etc.
- believe that $a^2 = a \times 2 = a2$ or 2a (which it can do on rare occasions but is not the case in general)
- When working with an expression such as 5a, some pupils may think that if a=2, then 5a = 52.
- may think that 3(g+4) = 3g+4
- The convention of not writing a coefficient of 1 (i.e. '1x' is written as 'x' may cause some confusion.
- some pupils may think that 5h – h = 5

Pedagogical notes (implementation)

Ensure that there is clarity about the distinction between representing a variable and representing an unknown.

Note that each of the statements ***4x, 42 and 4½*** involves a different operation after the 4

MINIMUM STANDARDS OF A MATHEMATICIAN:

Make sure that the variable x is always written curly, to avoid confusion with the multiplication symbol.

On computer : Use Times New Roman – Italic.

How will understanding be assessed & recorded (Impact)

End of Year Assessment in June/July
BAM task – Simplifying expressions
BAM task – Expanding brackets

How can parents help at home?

MathsWatch clips (Qualification KS3)
A2, A3, A4, A6, A7, A8, A10

Further reading/discussion

Reading / Enrichment

KM: Pairs in squares.
KM: Algebra rules
KM: Use number patterns
KM: Algebra ordering cards
KM: Spiders and snakes.
KM: Maths to Infinity: Brackets
NRICH: Your number is …
NRICH: Crossed ends
NRICH: Number pyramids and More number pyramids

Literacy

Algebra
Expression, Term, Formula (formulae), Equation, Function, Variable
Simplify / Collect like terms
Expand
Represent
Substitute
Evaluate

Numeracy Links

Careers Links

Scientists
Data analyst
Computer programmer
Mathematician
Financial analyst