YEAR 7

Autumn Term 1: Integer Number Structures and Introducing Algebra

THE MILTON KEYNES ACADEMY
Creative Education Trust

Integer Number Structures

Key Vocabulary

Accuracy	The degree to which a given value is correct.
Approximation	A number or result that is not exact but is close to the actual number.
Arithmetic	Properties of numbers and the four operations.
Ascending	Going up from smallest to largest.
Base	The number that gets multiplied when using a power e.g. 8^2, 8 is the base, and the result is $8 \times 8 = 64$.
Binary	A number system that uses base 2. All values are expressed using only 1 (one) and 0 (zero).
Calculate	Find the answer.
Carry Over	In calculations, when a value is taken over to the next place value column.
Column	The vertical sections of a column.
Column addition or subtraction	A formal written method of setting out an addition or a subtraction using place value columns.
Common Factor	A number which is a factor of two or more target numbers.
Commutative	Addition and multiplication of real numbers are commutative. This means that $a + b = b + a$ and $a \times b = b \times a$.
Crossing Zero	Moving from negative to positive on a number line (and the opposite).
Cube	The answer when three of the same number are multiplied e.g. 3 x 3 x 3 = 27.
Cube Root	A number whose cube is equal to a target value e.g. the cube root of 27 is 3.
Decimal	A number system that uses base 10. This is the system that we use in our everyday lives.
Denominator	For fractions, the bottom number e.g. In the fraction ⅔ the denominator is 3.
Descending	Going down largest to smallest.
Difference	The answer when we subtract one value from another.
Digits	The individual "symbols" used in a number system. In the decimal system we use 0 , 1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9.
Dividend	In division, the number that is divided e.g. In 15 ÷ 3, 15 is the dividend.
Divisor	In division, the number by which another is divided e.g. In 15 ÷ 3, 3 is the divisor.
Equal to	Having the same value as.
Equivalent to	Two items that have the same value but are written differently (e.g. equivalent fractions).
Estimation	Finding a rough or approximate answer by calculating with rounded numbers.
Evaluate	Find the value of a numerical or an algebraic expression.
Exchange	In column subtraction, taking part of a number from one column to another to assist the calculation.
Factors	Two integers that can be multiplied to give a target integer e.g. the factors of 10 are 1 , 2 , 5 and 10.
Factor Pair	The pair of factors that multiply to give a target number e.g. a factor pair of 10 is 2 x 5.
Greater Than	Having a higher value (shown by >).
Grid Method	A formal written method of multiplication.
Inclusive	Including the numbers at each end of a list of numbers.
Index (Indices)	Another word for a power.
Integer	A positive or negative whole number, including zero.
Inverse	The opposite to an original operation e.g. subtraction is the inverse of addition. Division is the inverse of multiplication.
Less Than	Having a lower value (shown by <).

Lots of	Multiply.
Multiples	The answer when I multiply two integers together. Think of it as "the numbers in the times table of a target number".
Multiplicand	A number to be multiplied by another e.g. In 5 × 3, 5 is the multiplicand as it is the number to be multiplied by 3.
Multiplier	What you are multiplying by e.g. In 5 × 3, 5 is the multiplier is 3.
Napier Method	A formal written method of multiplication (also called the lattice method).
Non-zero digit	Anything that is not a zero.
Number Line	A line where (positive and negative) numbers are shown.
Number System	Systems of counting that have different bases (see binary and decimal)
Numerator	For fractions, the top number e.g. In the fraction ⅔ the numerator is 2.
Order of Operations	The order in which different mathematical operations must be applied in a calculation. BIDMAS: Brackets Orders / Indices (powers) Division & Multiplication Addition & Subtraction
Overestimate	When the estimate is higher than the actual value.
Place Holder	In decimal notation, zero is used as a place holder to show that a particular place value column is empty.
Place Value	The value of a digit based on its position in a number. Example: in 1482 the digits represent 1 thousand, 4 hundreds, 8 tens and 2 ones respectively.
Power	A number used to show that a base number is multiplied by itself a given number of times. It is shown as a smaller number to the top right of the base e.g. in 3^4, 3 is the base and 4 is the power meaning 3 x 3 x 3 x 3.
Prime	A whole number greater than 1 that has exactly two factors, itself and 1.
Product	The result of multiplying two or more numbers together.
Quotient	The answer to a division calculation.
Reciprocal	The reciprocal of any value is $1/_{the\ value}$
Remainder	In division, the amount "remaining" after the operation (if you are finding a whole number answer). Example: 29 divided by 7 = 4 remainder 1.
Round up	Increasing the target digit by 1 if the next digit is 5 or more.
Significant figure	The most important digit/s in a number. The non-zero digit/s furthest to the left in the place value table.
Simplify	To write into simpler form.
Square	The answer when two of the same number are multiplied e.g. 3 x 3 = 9.
Square Root	A number whose square is equal to a target value e.g. the square root of 9 is 3.
Sum	The answer when we add two or more numbers together.
Underestimate	When the estimate is lower than the actual value.
Whole Number	An integer.
Work out	Find the answer.
Zero	Zero is the number that represents no amount or no objects.
Zero Pairs	The pairs are also called "zero pairs" because their sum is zero.

Numerical Representations

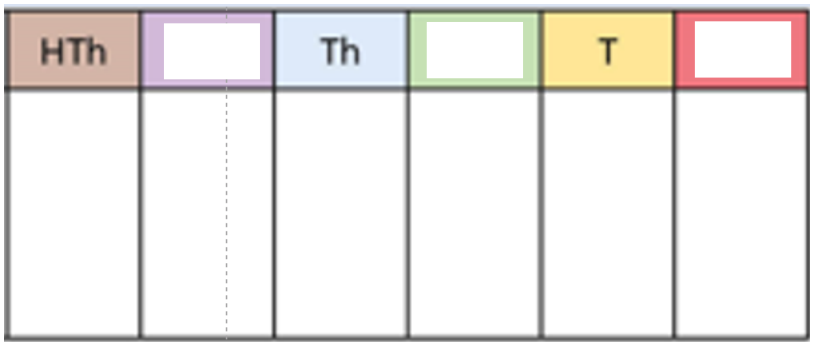
Key Vocabulary

Brackets	To show the calculation inside them should be done first in accordance with the order of operations.
Coefficient	The number attached to a letter in an algebraic term (and so multiplying the letter).
Collect	To combine together.
Common Factor	A number which is a factor of two or more target numbers.
Constant	A fixed value.
Division	An operation requiring you to share equally.
Equation	A mathematical statement showing that two things (usually algebraic expressions) are equal.
Expand	To multiply out a set of brackets.

Expression	A collection of algebraic terms (added/subtracted together).
Factor	Two integers (or terms) that can be multiplied to give a target integer (or term).
Factorise Fully	To take the highest common factor out of 2 or more numbers (or terms) in order to create brackets.
Factorise	To take a common factor out of 2 or more numbers (or terms) in order to create brackets.
Formula	A mathematical rule or relationship that uses letters to represent amounts which can be changed.
Identity	An equation which is always true, no matter what values are substituted.
Inverse	To do the opposite operation.
Like	Has (exactly) the same combination of letters (variables).
Multi-Step	More than one operation is needed to solve a problem.
Operation	Addition, subtraction, multiplication, and division.
Represent	the way of capturing a mathematical concept.
Simplify	To make less complicated (usually algebraic expressions).
Solve	To find an answer (usually to an equation).
Term	One part of an equation, expression or formula. A basic piece of algebra.
Unknown	Represented by a letter, a number which is not given at the start of the question.
Variable	A letter in algebra, the value of which can change depending on the value of an equation.

Retrieval Questions

1) Complete the headings in this place value table:



2) What is the value in words of the 6 in the number 306254? Six thousand.

3) What are the four operations? Addition, subtraction multiplication and division.

4) What does > mean? Greater than.

5) What does < mean? Less than.

6) What does ≥ mean? Greater than or equal to.

7) What does ≤ mean? Less than or equal to.

8) What does ≠ mean? Not equal to.

9) What operation is the inverse of division? Multiplication.

10) What operation is the inverse of addition? Subtraction.

11) What operation is the inverse of multiplication? Division.

12) What operation is the inverse of subtraction? Addition.

13) What does BIDMAS stand for? Brackets, Indices, Division, Multiplication, Addition, Subtraction.

14) Which parts of BIDMAS have equal priority? Addition/subtraction have equal priority and division/multiplication have equal priority.

15) List the first 10 prime numbers. 2 , 3 , 5 , 7 , 11 , 13 , 17 , 19 , 23 , 29.

16) List the first 10 square numbers. 1 , 4 9 , 16 , 25 , 36 , 49 , 64 , 81 , 100.

17) List the first 5 powers of 2. 2 , 4 , 8 , 16 , 32

18) What is the inverse of squaring a number? Square root.

19) What is the inverse of cubing a number? Cube root.

20) What does the symbol $\sqrt{\ }$ mean? Square root.

21) What does the symbol $\sqrt[3]{\ }$ mean? Cube root.

22) What does the symbol ≈ mean? Approximately equal to.

23) What does the symbol ≡ mean? Is equivalent to/is always equal to.

$$4x - 7 = 5$$

24) What is the value of the coefficient in this equation? 4

25) What is the variable in this equation? x

26) What are the constants in this equation? 7 and 5

27) Which of the following is a formula a) w + 4 = 6 b) $a^2 + b^2 = c^2$ c) ax + c? $a^2 + b^2 = c^2$

28) Write in words the meaning of the expression $\frac{3x}{5}$. Three times x then divided by 5.

29) Expand this bracket $5(2x + 3)$. $10x + 15$

30) Simplify this expression. $2a + 5b + 4a - 2b$. $6a + 3b$

Homework

- Homework will be set each week.
- Tasks will alternate between online tasks using Sparx Maths and retrieval practice revising the key words and variations on the retrieval questions shown above.
- All tasks will be focused on reinforcing the learning to date in Key Stage 3.

Additional Opportunities

If you wish to further develop your skills and knowledge for Key Stage 3 maths, you can use the following links:

https://www.thenational.academy/teachers/programmes/maths-secondary-ks3/units