

Year 10 Unit 1 Overview-Number and Algebra:

Test window: 12th November 2018- 16th November 2018

Target grade for tests:

You will learn about:

- Numbers and the number system (HCF, LCM, prime numbers)
- Accuracy
- Using standard form to write large and very small numbers
- The importance of performing operations in the correct order
- Simplifying and manipulating algebraic expressions

You will be able to:

- Identify and find factors, multiples, primes, HCF and LCM and use them to solve problems.
- Multiply, divide, add and subtract with integers, decimals and simple fractions.
- Round any whole number or decimal and use estimation to check calculations.
- Use BIDMAS in situations involving brackets, powers, roots and reciprocals.
- Interpret standard form $A \times 10^n$, where $1 \leq A < 10$ and n is an integer.
- Use and interpret algebraic notation.
- Simplify and manipulate algebraic expressions involving powers.
- Substitute numerical values into Scientific formulae.
- Rearrange formulae to change the subject.
- Communicate your methods verbally, using a range of mathematical vocabulary.
- Structure your methods showing clear steps of workings.
- Apply your skills to solve a variety of problems in real-life contexts.



Lesson Overview

NUMBERS AND THE NUMBER SYSTEM

- Recall prime numbers up to 100
- Understand the meaning of prime factor
- Write a number as a product of its prime factors
- Use a Venn diagram to sort information
- Use prime factorisations to find the highest common factor of two numbers
- Use prime factorisations to find the lowest common multiple of two numbers
- Know how to identify any significant figure in any number
- Approximate by rounding to any significant figure in any number
- Write a large (small) number in standard form
- Interpret a large (small) number written in standard form

CALCULATING

- Add or subtract from a negative number
- Add (or subtract) a negative number to (from) a positive number
- Add (or subtract) a negative number to (from) a negative number
- Multiply with negative numbers
- Divide with negative numbers
- Know how to square (or cube) a negative number
- Substitute negative numbers into expressions
- Enter negative numbers into a calculator
- Use a scientific calculator to calculate with fractions, both positive and negative
- Interpret a calculator display when working with negative numbers

CALCULATING Continued

- Understand how to use the order of operations including powers
- Understand how to use the order of operations including roots

Key Words

Refer to <http://studymaths.co.uk/glossary.php> for definitions of the key words

Prime
Prime factor
Prime factorisation
Product
Venn diagram
Highest common factor
Lowest common multiple
Standard form
Significant figure
Negative number
Directed number
Improper fraction
Top-heavy fraction
Mixed number
Operation
Inverse
Long multiplication
Short division
Power
Indices
Roots
Product
Variable
Term
Coefficient
Common factor
Factorise
Power
Indices
Formula, Formulae
Subject
Change the subject

ALGEBRAIC PROFICIENCY: TINKERING

- Know how to write products algebraically
- Use fractions when working in algebraic situations
- Identify common factors (numerical and algebraic) of terms in an expression
- Factorise an expression by taking out common factors
- Simplify an expression involving terms with combinations of variables (e.g. $3a^2b + 4ab^2 + 2a^2 - a^2b$)
- Know the multiplication (division, power, zero) law of indices
- Understand that negative powers can arise
- Substitute positive and negative numbers into formulae
- Be aware of common scientific formulae
- Know the meaning of the 'subject' of a formula
- Change the subject of a formula when one step is required
- Change the subject of a formula when a two steps are required

Notation

Index notation: e.g. 5^3 is read as '5 to the power of 3' and means '3 lots of 5 multiplied together'
Standard form (see key concepts) is sometimes called 'standard index form', or more properly, 'scientific notation'

Suggested reading or support/challenge available

Support is available from a Maths teacher in 'MORALE' in M1 daily from 1:30pm -1:45pm

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Cross curricular

SMSC:

- 1.1 Exploring, understanding and respecting cultural diversity e.g. exploration of different methods of calculation.
- 3.1 Developing personal qualities and using social skills (regular paired/ group work communication).
- 3.2 Participating, cooperating and resolving conflicts (paired/group activities).
- 4.2 Experiencing fascination, awe and wonder of mathematics.
- 4.4 Using imagination and creativity in learning.

Literacy: Verbal communication of understanding using key words in the correct context. Development of written communication of methods and strategies to problem solve.

NAC:

Science – Estimation. Round whole numbers and decimals. Order, add and subtract negative numbers. Use significant figures. Use standard form. Use formulae involving negative numbers. Use a calculator efficiently. Substitution into Scientific formulae, Rearrange formulae.

Business – Use formulae involving negative numbers.

MFL – Mental and written calculations with whole numbers and decimals. Use a calculator efficiently.

RE - Estimation.

PE - Round whole numbers and decimals.

Geography - Estimation. Round whole numbers and decimals. Use a calculator efficiently.

Creative Arts - Estimation. Round whole numbers and decimals. Use a calculator efficiently.