



# YEAR 7 Autumn TERM 2

'An ambitious curriculum that meets the needs of all'

## Medium Term Planning

1. Equality and Equivalence. 2. Place value, integers and decimals.  
3. Fractions, decimals and percentages

### UNIT: Equality and equivalence, (7 lessons)

**Previously met: See notes from KS2 National Curriculum**

- Introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand. (Year 6).

To be able to:

- Understand the meaning of equality.
- Understand and use fact families, numerically and algebraically.
- Solve one-step linear equations involving  $+/−$  using inverse operations.
- Solve one-step linear equations involving  $÷/×$  using inverse operations.
- Understand the meaning of like and unlike terms.
- Understand the meaning of equivalence.
- Simplify algebraic expressions by collecting like terms, using the  $≡$  symbol.

#### REMDINER

Use of balancing method and arrows when solving equations. It is important that we are consistent across all classes.

#### Links and interleaving

- Modelling real life contexts. This fits into all parts of mathematics, any context which requires unknowns.

### Place value & ordering integers & decimals (10/11 lessons)

**Previously met: See notes from KS2 National Curriculum**

#### Year 5

- Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.
- Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.
- Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.
- Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.
- Solve number problems and practical problems that involve all of the above.
- Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

## Year 6

- Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.
- Round any whole number to a required degree of accuracy
- Use negative numbers in context, and calculate intervals across zero.
- Solve number and practical problems that involve all of the above.

To be able to:

- Recognise the place value of any number in an integer up to one billion.
- Understand and write integers up to one billion in words and figures.
- Work out intervals on a number line.
- Position integers on a number line.
- Round integers to the nearest power of 10.
- Compare two numbers using  $=$ ,  $\neq$ ,  $<$ ,  $>$ ,  $\leq$ ,  $\geq$
- Order a list of integers.
- Find the range of a set of numbers.
- Find the median of a set of numbers.
- Understand place value for decimals.
- Position decimals on a number line.
- Compare and order any number up to one billion.
- Round a number to 1 significant figure.
- **Write 10, 100, 1000 etc. as powers of ten.**
- **Investigate negative powers of ten.**
- **Write decimals in the form  $A \times 10^n$ .**

## Links and interleaving

- Solving inequalities.
- Solving inequalities with number lines.
- Calculations in standard form.

***Fractions, decimals and percentages (10/11 lessons).***

***Previously met: See notes from KS2 National Curriculum***

## Year 4

- Recognise and show, using diagrams, families of common equivalent fractions
- Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
- Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number
- Add and subtract fractions with the same denominator
- Recognise and write decimal equivalents of any number of tenths or hundredths
- Recognise and write decimal equivalents to  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .
- Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths

- Round decimals with one decimal place to the nearest whole number
- Compare numbers with the same number of decimal places up to two decimal places
- Solve simple measure and money problems involving fractions and decimals to two decimal places.

### Year 5

- Read and write decimal numbers as fractions [for example,  $0.71 = \frac{71}{100}$ ].
- Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.
- Round decimals with two decimal places to the nearest whole number and to one decimal place.
- Read, write, order and compare numbers with up to three decimal places.
- Solve problems involving number up to three decimal places.
- Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal.
- Solve problems which require knowing percentage and decimal equivalents of  $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$  and those fractions with a denominator of a multiple of 10 or 25.

### Year 6

- Compare and order fractions, including fractions  $> 1$ .

To be able to:

- Represent tenths and hundredths as diagrams.
- Represent tenths and hundredths on number lines.
- Interchange between fractional and decimal number lines.
- Convert between fractions and decimals – tenths and hundredths.
- Convert between fractions and decimals – fifths and quarters.
- **Convert between fractions and decimals – eighths and thousandths.**
- Understand the meaning of percentage using a hundred square.
- Convert fluently between simple fractions, decimals and percentages.
- Use and interpret pie charts.
- Represent any fraction as a diagram.
- Represent fractions on number lines.
- Identify and use simple equivalent fractions.
- Understand fractions as division.
- Convert fluently between fractions, decimals and percentages.
- **Explore fractions above one, decimals and percentages.**

### Links and interleaving

- Ordering numbers which involve decimals, percentages and fractions.
- Calculations involving fractions and decimals.
- Sequences involving fractions and decimals.
- Median and mode with data involving decimals and fractions.

<b>Spiritual, moral, social, and cultural development</b>	<p><b>SMSC:</b> Making choices, looking for patterns which may reflect the natural world, supporting and collaborating with each other, realisation that mathematics is an international language and making cultural links as we explore the history of mathematics.</p> <p><b>PSHE/British Values:</b> Working collaboratively, being respectful during discussion and valuing contributions made by others</p> <p><b>Skills Builder:</b> Key skills in numeracy used in all topic areas.</p>
<b>Numeracy</b>	Focus on key skills.
<b>Literacy</b>	<p><b>Vocabulary Tier 2:</b> Command words displayed in the classroom and italicized/bold font used in shared resources/presentations. These are a constant focus in discussion and questioning,</p> <p><b>Vocabulary Tier 3:</b> Title slide in all shared resource presentations show the key vocabulary for each topic.</p> <p><b>Reading:</b> Underlining command words,</p> <p><b>Writing:</b> Modelling solutions</p> <p><b>Oracy:</b> Think, pair, share, discussion, verbal feedback (peer to peer), questioning, student modelling</p>
<b>Becoming future ready</b>	<p><b>Personal Skills:</b> As a Mathematics student you will learn many skills: you will gain opportunities to listen to others supportively and to use questioning to develop your own understanding, you will learn how to cope with challenging questions and how to build up your resilience, you will get the chance to work on your own and with others. You will develop problem solving skills and you will learn how to break a problem down into smaller more manageable steps. You will learn how to collaborate with others when solving problems and you will learn how to articulate your solution to a problem.</p> <p><b>Employability:</b> Mathematical skills are invaluable in the workplace. There are many transferable skills which are much valued by employers. Specific career paths for each topic are discussed at the beginning of each unit of work.</p>
<b>Adaptation</b>	<ul style="list-style-type: none"> <li>• By progressive questioning: exploring pupils' understanding through interactive dialogue.</li> <li>• By outcome: different learners will produce different outcomes.</li> <li>• By resource: worksheets are clearly presented and accessible.</li> <li>• By intervention: by providing different levels of supervision and support.</li> <li>• By grouping/setting: according to prior attainment, gender, social preference, preferred learning style.</li> <li>• By offering optional activities: In class or as homework, to extend learning.</li> </ul>
<b>QFT/SEND Provision</b>	
<b>Implementation Curriculum Delivery</b>	<p><b>Support (S), Core (C), Extension (E).</b></p> <p><b>Equality and equivalence – small steps</b></p> <ul style="list-style-type: none"> <li>• Understand the meaning of equality. (S)</li> <li>• Understand and use fact families, numerically and algebraically.</li> <li>• Solve one-step linear equations involving <math>+/–</math> using inverse operations. (S/C)</li> <li>• Solve one-step linear equations involving <math>÷/×</math> using inverse operations. (S/C)</li> <li>• Understand the meaning of like and unlike terms. (S/C)</li> <li>• Understand the meaning of equivalence. (S)</li> <li>• Simplify algebraic expressions by collecting like terms, using the <math>≡</math> symbol. (S/C)</li> </ul> <p><u>Extension tasks – These could be interleaved within the core knowledge</u></p> <ul style="list-style-type: none"> <li>• Multiplying terms (involving powers if needed)</li> <li>• Expanding brackets and, expanding and simplifying brackets.</li> </ul>
<b>Learning Outcomes (Most Powerful Knowledge)</b>	<p><b>Place value &amp; ordering integers and decimals – small steps</b></p> <ul style="list-style-type: none"> <li>• Recognise the place value of any number in an integer up to one billion. (S)</li> <li>• Understand and write integers up to one billion in words and figures. (S)</li> <li>• Work out intervals on a number line. (S)</li> <li>• Position integers on a number line. (S)</li> <li>• Round integers to the nearest power of 10. (S)</li> <li>• Compare two numbers using <math>=, ≠, &lt;, &gt;, ≤, ≥</math> (S)</li> <li>• Order a list of integers. (S)</li> <li>• Find the range of a set of numbers. (C)</li> <li>• Find the median of a set of numbers. (C)</li> <li>• Understand place value for decimals. (C)</li> <li>• Position decimals on a number line. (C)</li> <li>• Compare and order any number up to one billion. (C)</li> <li>• Round a number to 1 significant figure. (C)</li> <li>• <b>Write 10, 100, 1000 etc. as powers of ten. (H)</b></li> <li>• <b>Investigate negative powers of ten. (H)</b></li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Write decimals in the form <math>A \times 10^n</math>. (H)</b></li> </ul> <p><u>Extension tasks</u></p> <ul style="list-style-type: none"> <li>• Rounding to a greater number of significant figures.</li> </ul> <p><b>Fractions, decimals and percentages - small steps</b></p> <ul style="list-style-type: none"> <li>• Represent tenths and hundredths as diagrams. (S)</li> <li>• Represent tenths and hundredths on number lines. (S)</li> <li>• Interchange between fractional and decimal number lines. (C)</li> <li>• Convert between fractions and decimals – tenths and hundredths. (C)</li> <li>• Convert between fractions and decimals – fifths and quarters. (C)</li> <li>• <b>Convert between fractions and decimals – eighths and thousandths. (H)</b></li> <li>• Understand the meaning of percentage using a hundred square. (S)</li> <li>• Convert fluently between simple fractions, decimals and percentages. (S)</li> <li>• Represent any fraction as a diagram. (C)</li> <li>• Represent fractions on number lines. (C)</li> <li>• Identify and use simple equivalent fractions. (C)</li> <li>• Understand fractions as division. (C)</li> <li>• Convert fluently between fractions, decimals and percentages. (C)</li> <li>• <b>Explore fractions above one, decimals and percentages. (H)</b></li> </ul> <p><u>Extension</u></p> <ul style="list-style-type: none"> <li>• Use and interpret pie charts.</li> <li>• Converting between mixed numbers and improper fractions.</li> <li>• Explore recurring decimals.</li> </ul>
<b>Current learning to be developed in the future within:</b>	<p><u>Equality and equivalence</u></p> <ul style="list-style-type: none"> <li>• Form and solve two step equations (Year 7)</li> <li>• Solve inequalities (Year 8)</li> <li>• Form and solve equations with brackets (Year 8)</li> <li>• Solve equations and inequalities with unknowns on both sides (Year 9)</li> <li>• Simultaneous equations (Year 10)</li> <li>• Quadratic equations (Year 10/11)</li> </ul> <p><u>Place value &amp; ordering integers &amp; decimals</u></p> <ul style="list-style-type: none"> <li>• Order directed numbers (Year 7)</li> <li>• Write numbers of any size in standard form.</li> <li>• Rounding to any give number of decimal places or significant figures. (Year 8)</li> <li>• Limits of accuracy (Year 10)</li> </ul> <p><u>Fractions, decimals and percentages</u></p> <ul style="list-style-type: none"> <li>• Fractions and percentages of amounts. (Year 7)</li> <li>• Percentage increase/decrease with/without multipliers. (Year 8)</li> <li>• Express one number of a fraction of another. (Year 8)</li> <li>• Explore calculator and non calculator methods. (Year 8)</li> <li>• Reverse percentages and repeated percentage change. (Year 9)</li> </ul>
<b>Assessment</b>	Refer to assessment maps for formative and summative assessment opportunities.
<b>Impact</b>	Attainment and Progress – Refer to assessment results / data review documentation.