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| **Year 7 – Mathematics – 2024-25** |
| **Curriculum intent** | Through mathematics lessons we promote mathematical thinking to allow all students to achieve their mathematical potential and engage in the study of mathematics. Using a mastery style approach to mathematics allows all students to develop their fluency, reasoning and problem-solving using representations of mathematical ideas. As students progress, topics from previous learning will be interleaved into future learning so students develop application and skill links between different areas of mathematics.In Year 7, students start their journey with algebraic thinking, developing pattern spotting, and a deep understanding of the basic algebraic forms and fundamentals. Much of this work will be developed using physical manipulatives and pictorial representations to further their numerical reasoning. Students will study the concepts of equivalence and equality in both algebraic and numerical form; this will link to real life concepts and they will explore associated topics to apply these skills. As Year 7 continues, students will explore new areas of mathematics linked to the four operations and fractions, allowing students to develop and apply these central concepts to different branches of mathematics, including frequency diagrams, averages and area. Students will develop their application of calculations through using formal methods whilst developing their understanding to enable them to be flexible when problem solving in a variety of contexts. |
| **Term** | **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Knowledge** | * Sequences
* Understand and Use Algebraic Notation
 | * Equality and Equivalence
* Place Value and Ordering Integers and Decimals
 | * Fraction, Decimal and Percentage Equivalence
* Solve Problems with Addition and Subtraction
 | * Solve Problems with Addition and Subtraction (cont.)
* Solve Problems with Multiplication and Division
 | * Fraction and Percentage of Amounts
* Operations and Equations with Directed Number
 | * Operations and Equations with Directed Number (cont.)
* Addition and Subtraction of Fractions
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| **Term** | **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Skills** | * Moving between different numerical, graphical and diagrammatic representations.
* Make and test conjunctures about patterns.
* Recognise & generate terms.
* Use a calculator to check accuracy.
* Use algebra to generalise the structure of arithmetic contexts.
* Formulate mathematical relationships.
* Recognise and use relationships between operations, including inverse operations.
* Use and interpret formal algebraic notation.
* Substitute into expressions.
* Generate terms of a sequence.
* Produce graphs of linear functions of one variable.
 | * Simplify and manipulate algebraic expressions to maintain equivalence.
* Use approximation through rounding to estimate answers.
* Use algebraic methods to solve linear equations with one variable.
* Use place value for decimals.
* Understand and use place value for decimals, measures, and integers of any size.
* Use mathematical symbols for equality and inequality.
* Compare and order any number up to one billion.
* Describe, interpret and compare the median and range.
* Use powers of ten in calculations.
* Write numbers in standard form.
 | * Represent decimals and fractions on a number line.
* Compare quantities using fractions, decimals and percentages.
* Express one quantity as a fraction of another.
* Use and interpret simple pie charts.
* Using diagrams to represent any fraction as a diagram, and on a number line.
* Identify and use equivalent fractions.
* Understanding fractions as division.
* Convert fluently between simple fractions, decimals and percentages.
* Understanding fractions greater than a whole.
* Use the properties of addition and subtraction, including the associative law of arithmetic.
 | * Develop mental strategies for addition and subtraction.
* Use formal written methods for addition and subtraction, applied to positive integers and decimals.
* Recognise and use the most appropriate method: mental strategies, formal written or calculator.
* Solve problems involving perimeter, financial maths, timetables, frequency diagrams.
* Use the properties of multiplication and division, including the commutative and associative laws of arithmetic.
* Understand and use factors and multiples.
* Multiply and divide integers and decimals by powers of 10.
* Convert between different metric units.
* Use formal written methods for multiplication and division, applied to positive integers and decimals.
* Understand and use order of operations.
* Find fraction and percentage of amounts using mental methods and a calculator.
* Solve fraction and percentage problems.
 | * Find fraction and percentage of amounts using mental methods and a calculator.
* Solve fraction and percentage problems.
* Understand and use multiple representations of directed numbers.
* Perform calculations that cross zero.
* Complete calculations using all four operators involving direct numbers.
* Use of a calculator with directed numbers.
 | * Evaluate algebraic expressions involving directed numbers.
* Understand and use two step equations.
* Explore powers and roots.
* Understand representations of fractions.
* Understand and use equivalent fractions.
* Convert between mixed numbers and fractions.
* Add and subtract proper fractions in any form.
* Add and subtract improper fractions and mixed numbers.
* Use fractions in algebraic contexts.
* Use equivalence to add and subtract decimals, percentages and fractions.
* Add and subtract simple algebraic fractions.
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| **Assessments** | * In class assessments.
* End of unit assessments.
 | * In class assessments.
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* End of unit assessments.
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| **Enrichment** | * Work on your IQ and test your pattern spotting skills https://www.intelligencetest.com/questions/pattern-recognition/index.html
* Enter the National Cipher Challenge (Oct-Jan) https://www.cipherchallenge.org/
* Research the famous Fibonacci sequence. Can you summarise your research in a poster or factsheet?
* Try to solve the game about following sequences (app also available) http://gameaboutsquares.com/
 | * Try out some of the UKMT Junior Challenge questions – some students get the chance to enter in Feb!) https://www.interactive-maths.com/ukmt-random-question-generator.html
* Investigate palindromes – here’s a short article to get you started https://nrich.maths.org/2574
* Equivalence pairs – can you get to cards face down Level 5? https://nrich.maths.org/1249
 | * If you’ve been selected for the UKMT Junior Challenge questions – get some extra practice in! https://www.interactive-maths.com/ukmt-random-question-generator.html
* In newspapers and magazines find fractions decimals or percentages in them and convert all the values you find.
 | * You’re throwing a birthday party for your friend. What will you do and how much will it cost?
 | * Make a how to use your calculator guide! It will come in helpful for future learning.
* You’re planning an epic journey, use Google Earth to figure out where you will travel, and how far in total you will travel. Can you give distances in cm, m and km?
 | * Can you investigate average temperatures across the world: can you find very cold cities/places and compare them to very warm cities/places? Work out the differences.
* Try to keep practising your negative number skills! https://www.cimt.org.uk/projects/mepres/book7/bk7i15/bk7\_15i1.htm & https://www.cimt.org.uk/projects/mepres/book7/bk7i15/bk7\_15i2.htm

Can you design a board game which tests your fraction arithmetic? |