## The purpose of

 our curriculumHow does the curriculum demonstrate progress?

The purpose of our maths curriculum is to ensure that each and every pupil can progress in their maths. Our curriculum is ambitious across all year groups and it is designed to give all pupils, no matter their background and their starting points, the skills, knowledge and belief to be successful both inside the classroom and in the wider world. We know that, in maths, gaps in pupils' knowledge cause serious difficulties in pupils' ability to progress into the next stage of learning. As a result, we purposely sequence our curriculum to check for prior knowledge before building on it. We have a strong focus on explicit instruction when modelling, as we know that this is the best way to help pupils make connections and build on their prior knowledge. We avoid discovery learning, as this can lead to misconceptions and lost learning times.

At KS3, we follow a small steps approach. This means all content is broken down so that every aspect of the curriculum is examined, with nothing left to chance. We isolate what we want pupils to think about, avoiding cognitive overload and dealing with the limitations of pupils working memories. We teach for depth, not breadth ensuring that pupils don't just learn a procedure but they have an understanding of the underlying concepts. Using manipulatives helps pupils to do this, only moving towards the abstract when appropriate. The curriculum is purposely designed to ensure fluency and retention buy continuously interweaving prior content with new concepts.

At KS4, we continue to help pupils make connections between prior knowledge and new concepts. We do this by sequencing our curriculum to make these links explicit for pupils. Historically our pupils have struggled to recall the knowledge they need for future learning. As a result, we have a focus on retrieval practice. Every lesson, pupils complete a retrieval 'do-now' activity making them think hard to recall the knowledge they need. Our curriculum also identifies the prior knowledge needed for each new unit of work. This allows teachers to determine if pupils have a solid foundation, without any gaps in knowledge, before they introduce new ideas.

The maths curriculum at KS3 and KS4 continuously builds on prior knowledge and learning to ensure our pupils make progress. It is sequenced so the foundations of basic maths are taught at the start of the course and that material then becomes assumed knowledge for the rest of the units. For example, the basics of algebra and algebraic notation will be taught and then in subsequent units' pupils will have to apply this knowledge to different situations such as sequences and graphs. This allows us to ensure that pupils have progressed from skills to application.

The new KS3 curriculum ensures that pupils have a deep understanding of basic processes of maths and then move on to linking different maths schema, such as learning how to order numbers before connecting that schema to find the mean and range of a set of numbers. We know that progressing to teaching new content when pupils are not secure in earlier content will limit their chances of making good progress later. This is why we follow the White Rose Maths scheme of learning, where we break the curriculum down into 'small steps'. This makes the curriculum more manageable for pupils and ensures pupils have a deeper understanding of threshold concepts rather than pupils learning things at surface level. We are starting to use concrete and pictorial manipulatives to deeper the pupils understanding with the aim of pupils progressing to working purely in the abstract. This deeper understanding allows pupils to make more connections and build on their existing schema as they make their way through the curriculum. Flashback 4's are used for every 'do-now' activity. These are carefully designed, retrieval activities that ensure pupils are retrieving content from their current unit as well as previously taught content. This ensures pupils are still making progress with prior learning. Every three weeks pupils complete a 'Whole Class Feedback' sheet. This sheet is based on the misconceptions found when teachers take in a sample of their classes' books. This allows teachers and pupils to address misconceptions before they become embedded. Topic assessments are then completed at the end of each unit of work, these are
based solely on the content of the topic being assessed. At the end of each term, pupils complete a termly assessment that covers content taught that term and also previous terms. After each assessment pupils are provided with a 'DIRT feedback' sheet where teacher comments enable them to complete similar questions to the ones, they made mistakes on, thus enabling pupils to demonstrate further progress.

Retrieval is extended at GCSE as the later units combine various elements of maths together with a particular emphasis on algebra and geometry. This aspect of the curriculum shows a clear progression from skills and procedure to multiple applications. The KS4 scheme has been reordered to increase the amount of retrieval pupils need to complete. Instead of the content being blocked it forces pupils to retrieve and therefore they can demonstrate progression. For example, the vectors part of unit 19 used to be taught in one block and then assessed. Pupils never had a chance to retrieve their knowledge and therefore it was forgotten easily so they could not make progress. Now the vectors section is split up over the unit, forcing pupils to retrieve and therefore strengthen their long-term memory. Pupils are assessed after every unit to monitor progress and to also highlight misconceptions. These assessments are designed so that throughout the year they incorporate questions based on content from previous topics. After each assessment pupils are again provided with a 'DIRT feedback' sheet where teacher comments enable them to complete similar questions to the ones, they made mistakes on, thus enabling pupils to demonstrate further progress. Every Do-Now activity is retrieval based, this means pupils can demonstrate progression after the content has been taught. These retrieval activities also ensure that every pupil is fluent and confident in the facts and methods, with an emphasis on the threshold concepts, which are most frequently needed in order to make progress and be successful in further study. Throughout each topic pupils are given mini assessments to check on their progress so far. The aim is to expose pupils to exam style questions and check their understanding of the content before the summative assessments at the end of the unit. Pupils are then provided with a 'mini-DIRT' sheet, with guidance on how to complete questions they made mistakes on. This enables pupils to demonstrate the progress they have made and unpick any misconceptions they may have. Pupils also complete a practice GCSE paper once a term, this exposes them to more exam style questions and allows them to continue to use and apply their KS3 knowledge.

Our KS3 scheme focuses on the basics, teaches for understanding and teaches depth not breath. It is sequenced by small steps, so as not to overload pupils and to help pupils focus on why a method works, rather than a process and avoid cognitive overload. We avoid making assumptions about their knowledge and ensure we cover the basics to fill any gaps. Ensuring we teach for breath and understanding allows us to maintain our high expectations and push all pupils to work to the best of their ability. All pupils follow the same scheme of work, although our nurture classes may do it at a slower pace. The KS3 curriculum does contain higher objectives that only our higher ability pupil's cover. But what is higher content in year 7 becomes core content in year 8 and 9 , so eventually all pupils will cover all objectives. The theme for the units taught in Year 7 Autumn 1 is Algebraic Thinking. This might seem quite controversial to start with algebra, but there are reasons for this. Algebra is not a theme focused on much by primary schools. By starting with algebra, we give all pupils a fresh start, they are starting their secondary maths journey on a level footing. We allow them to use calculators so any gaps in basic numeracy and arithmetic won't be a barrier for pupils. This helps improve their confidence with maths, which can be the biggest barrier faced by pupils. This also allows us to link the threshold concept of algebraic techniques explicitly with arithmetic structures covered in the primary school. The majority of the remaining units in Year 7 are number focused with an emphasis on place value and proportion, as these are both threshold concepts. This is the basis of maths, so we don't want students to progress to other areas without ensuring they have a deep understanding of place value and basic proportion. Although the focus is on number we ensure pupils are able to retrieve their algebra knowledge. Algebra is interleaved in the remaining topics. For example, pupils use their adding and subtracting fraction skills to continue sequences that involve fractions and during the Spring directed number unit, pupils have to evaluate algebraic expressions. The curriculum is also carefully designed to help pupils make connections between their number work and other areas of maths. For example, when working on multiplication and division our curriculum introduces calculating the area of shapes and calculating the mean. This allows pupils to apply their multiplication and division skills in context. During the summer term, pupils are introduced to the basics of geometry. This allows us to create solid foundations that pupils can build on during year 8 and 9 .

During Autumn 1 of year 8 pupils complete the remaining units of the year 7 curriculum. We cannot skip these units and move on to the year eight content as an effective maths curriculum builds on prior knowledge. Pupils would not be able to access the tables and probability unit of work if they are not taught the sets and probability unit. During year 8 pupils build on their number and algebra skills as they are introduced to more threshold concepts: ratio and proportion, probability and formal algebra and graphs. We continue to use small steps to ensure pupils focus on one key aspect at a time and build their knowledge. These small steps are carefully sequenced to ensure pupils can make connections between objectives. During brackets, equations and inequalities pupils start with multiplying a single bracket, to expanding and simplify multiple single brackets to expanding a pair of binomials. We also introduce to 'review steps' that ensure pupils retrieve key knowledge needed for a unit of work before they build on it. For example, we 'review' the year 7 step of converting between key fractions, decimals and percentages before introducing the step of converting between fractions and decimals greater than 100.
Similar to year 8, we begin our year 9 curriculum by completing the remaining year 8 units of work. We continue to build on the key areas of maths and explicitly introduce statistics. In year 7, pupils are introduced to averages and range by making connections to their four operations work. In year 9 we bring these ideas together and introduce them as measures of location. Here pupils not only need to calculate the measures but interpret them and select the appropriate measure. Other year 9 units also continue to build on prior knowledge. The unit of straight-line graphs would not be able to be fully understood without the year 8 working in the Cartesian plan unit. And forming and solving equations build on the year 8 algebra units. The year 9 content is more complex than year 7 and 8 in order to prepare pupils for GCSE.
Our year 10 and 11 pupils follow our GCSE scheme of learning which they started in year 9 . We split the curriculum into higher and foundation and also include a nurture scheme of work. In year 10 the nurture scheme of work mimics the foundation scheme, but pupils work through it at a slower pace. In year 11, the nurture curriculum focuses on building difficulty through each GCSE grade, starting at grade 1 content and moving onto the next grade once the previous grade has been mastered. This is to build out pupils' confidence so they can achieve their potential. There are five key areas of GCSE maths and our curriculum ensures pupils access all five areas. It started with the basics of each area in year 9 to ensure pupils have strong core schema. The remaining units are sequenced to build connections from the core schema and retrieve key objectives.
The GCSE units of work are sequences so that each new unit requires prior knowledge from previous contents and build on it. Unit 21, sequences, cannot be completed until pupils have a good understanding of indices, substitution, algebraic notation, surds, fractions and multiplication. This is why we have sequenced the sequences unit of work to be taught near the end of the scheme of work so we can ensure all the pre-requisite knowledge is fully understood. As these pre-requisite skills are important, we ensure we retrieve these skills regularly. For example, indices are included in the following units $1,2,6,10,13,14,17$ and 18 . Sometimes they are implicit, such as completing a table of value for a quadratic graph in unit 15. Other times they are explicitly taught, such as in units 13 and 17 . The indices objectives included in unit 17 are more challenging than those in unit 13 as they are designed to build on pupils' unit 13 knowledge. Unit 16, handling data 2 , involves calculating averages from grouped frequency tables and using cumulative frequency graphs and box plots to interpret quartiles. This builds on calculating averages and quartiles from lists of data. Previously each unit of work was sequenced in blocks. For example, in unit 10, Equations and Inequalities, all linear equations objectives were taught one after the other. This meant that pupils struggled to find connections between the new learning and what they had covered before, they also struggled to remember all new content. Now we sequence each unit with the purpose of building on prior learning and making connections. Now once solving linear equations with unknowns on one side is taught, we move on to solving inequalities with unknowns on one side. This highlights the similarities and differences of inequalities and equations and allows pupils to make connections. We also space out solving simultaneous equations, in order to ensure pupils have the opportunity to retrieve their prior learning before making connections with new. Each unit is sequenced in a similar, purposeful way.
How do skills develop over time? the new schema being taught. For example, sequences is explicitly taught in year 7 , year 8 and 7 and year 11 is greater than year 8 . Over time we also expect our pupils to use a combination of skills in order to achieve a new skill. In year 7,8 and 11 we ask pupils
to continue linear and non-linear sequences but in year 11 pupils may be required to use their surds knowledge in order to continue a higher order sequence. Pupils sequence skills are also implicitly developed in other topics such as linear graphs, where pupils need to link the idea of what is means to be linear to a graphical representation. Or in substitution, where pupils need to use their substitution skill to determine the sequence type.
Across KS3 pupils will develop better tools to be able to approach complex and more advance questions. Tools include bar models, visual representations after exposure to physical resources such as counters and algebra tiles etc. Moving towards abstract maths rather than always starting with pictorial. At KS4 pupils skills are developed further by continuing to make connections between topics, such as: negative numbers and number lines, multiplying decimals and multiplying and dividing by powers of 10 and dividing decimals and fractions. We give them access to more applied questions. For example, we aim for pupils to move past simply adding and subtracting integers and decimals but to use their skills to problem solve and work with more complex, worded questions. Pupils also have more chances to apply their skills through exam style questions in lessons and through DIRT and Mini DIRT. The complexity of these questions increases throughout KS4.

|  | Year Group | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| What will be taught? | 7 | Algebra: Sequences <br> Algebra: Understand and use algebraic notation <br> Algebra: Equality and equivalence | Algebra: Equality and equivalence <br> Number: Place value and ordering integers and decimals <br> Number: Fraction, decimal and percentage equivalence | Number: Fraction, decimal and percentage equivalence <br> Stage 7 assessment 1 <br> Number: Solve problems with addition and subtractions | Number: Solve problems with multiplication and division (LT2-9) <br> Number: Fractions and percentages of amounts (LT2-9) | Number: Operations and equations with directed number <br> Number: Addition and subtraction of fractions | Number: Addition and subtraction of fractions <br> Stage 7 assessment 2 <br> Geometry and Measures: constructing, measuring and using geometric notation <br> Geometry and Measures: Developing geometric reasoning |
|  | 7 <br> Nurture <br> (X3 and <br> Y3) | Algebra: Sequences <br> Algebra: Understand and use algebraic notation <br> Algebra: Equality and equivalence | Algebra: Equality and equivalence <br> Number: Place value and ordering integers and decimals <br> Number: Fraction, decimal and percentage equivalence | Number: Fraction, decimal and percentage equivalence <br> Stage 7 assessment 1 <br> Number: Solve problems with addition and subtractions | Number: Solve problems with multiplication and division (LT2-9) <br> Number: Fractions and percentages of amounts (LT2-9) | Number: Operations and equations with directed number <br> Number: Addition and subtraction of fractions | Number: Addition and subtraction of fractions <br> Stage 7 assessment 2 <br> Geometry and Measures: constructing, measuring and using geometric notation <br> Geometry and Measures: Developing geometric reasoning |

## Curriculum Intent

| 8 | Number: Developing number sense <br> Probability: Sets and Probability <br> Number: Prime numbers and proof | Number: Prime numbers and proof Stage 7 assessment 3 <br> Proportion: Ratio and Scale <br> Proportion: <br> Multiplicative Change <br> Proportion: Multiplying and Dividing Fractions | Proportion: Multiplying and Dividing Fractions <br> Representations: <br> Working in the <br> Cartesian Plane <br> Representations: <br> Representing Data | Representations: Representing Data <br> Representations: Tables and Probability <br> Stage 8 assessment 1 <br> Algebra: Brackets, Equations and Inequalities | Algebra: Brackets, Equations and Inequalities <br> Algebra: Sequences <br> Algebra: Indices <br> Developing Number: <br> Fractions and <br> Percentages | Developing Number: <br> Fractions and Percentages (LT2-9) <br> Developing Number: Standard Form <br> Developing Number: Number Sense |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 8 Nurture <br> (X3) | Number: Addition and subtraction of fractions <br> Stage 7 assessment 2 <br> Geometry and Measures: constructing, measuring and using geometric notation | Geometry and Measures: Developing geometric reasoning <br> Number: Developing number sense <br> Probability: Sets and Probability <br> Number: Prime numbers and proof | Number: Prime numbers and proof <br> Stage 7 assessment 3 <br> Proportion: Ratio and Scale <br> Proportion: <br> Multiplicative Change <br> Proportion: Multiplying and Dividing Fractions | Proportion: Multiplying and Dividing Fractions <br> Representations: <br> Working in the <br> Cartesian Plane <br> Representations: <br> Representing Data | Representations: Tables and Probability <br> Stage 8 assessment 1 <br> Algebra: Brackets, Equations and Inequalities <br> Algebra: Sequences <br> Algebra: Indices | Algebra: Indices <br> Developing Number: <br> Fractions and <br> Percentages (LT2-9) <br> Developing Number: <br> Standard Form <br> Developing Number: <br> Number Sense |

## Curriculum Intent

| 9 | Developing Number: <br> Fractions and Percentages(LT2-9) <br> Developing Number: Standard Form <br> Developing Number: Number Sense | Developing Number: Number Sense <br> Stage 8 assessment 2 <br> Developing Geometry: Angles in parallel Lines and Polygons <br> Developing Geometry: Area of Trapezia and Circles | Developing Geometry: <br> Area of Trapezia and Circles <br> Developing Geometry: Line Symmetry and Reflection <br> Reasoning with Data: The Data Handling Cycle <br> Reasoning with Data: Measure of Location | Reasoning with Data: Measure of Location Stage 8 assessment 3 Reasoning with Algebra: Straight Line Graphs Reasoning with Algebra: Forming and Solving Equations | Reasoning with Algebra: Forming and Solving Equations <br> Constructing in 2 and 3 Dimensions: ThreeDimensional Shapes <br> Constructing in 2 and 3 Dimensions: Constructions and Congruency <br> Stage 9 assessment 1 | Reasoning with Numbers: Numbers <br> Reasoning with Numbers: Using Percentages (LT2-9) <br> Reasoning with Geometry: Rotation and Translation <br> Reasoning with Geometry: Pythagoras' Theorem <br> Stage 9 assessment 2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $9$ <br> Nurture | Representations: Tables and Probability <br> Stage 8 assessment 1 <br> Algebra: Brackets, Equations and Inequalities <br> Algebra: Sequences <br> Algebra: Indices | Developing Number: <br> Fractions and Percentages (LT2-9) <br> Developing Number: Standard Form <br> Developing Number: Number Sense <br> Stage 8 assessment 2 | Developing Geometry: Angles in parallel Lines and Polygons <br> Developing Geometry: <br> Area of Trapezia and Circles <br> Developing Geometry: Line Symmetry and Reflection | Reasoning with Data: The Data Handling Cycle <br> Reasoning with Data: Measure of Location <br> Reasoning with Algebra: Straight Line Graphs | Reasoning with Algebra: Straight Line Graphs <br> Reasoning with Algebra: Forming and Solving Equations <br> Constructing in 2 and 3 Dimensions: ThreeDimensional Shapes | Constructing in 2 and 3 Dimensions: Constructions and Congruency <br> Stage 9 assessment 1 <br> Reasoning with Numbers: Numbers <br> Reasoning with Numbers: Using Percentages (LT2-9) <br> Reasoning with Geometry: Rotation and Translation |

## Curriculum Intent

|  | 10 <br> Higher <br> X1 \& Y1 | Equations and Inequalities H <br> Circles and Constructions H | Circles and Constructions H <br> Ratio H <br> Factors, Powers and Roots H | Factors, Powers and Roots H <br> Graphs 1 H | Graphs 1 H <br> Working in 3D H | Handling Data 2 H <br> Calculations 2 H | Graphs 2 H |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 10 <br> Foundati <br> on <br> $X 2 \& Y 2$ | Measures and Accuracy F <br> Equations and Inequalities F | Equations and Inequalities F <br> Circles and Constructions F | Circles and Constructions F <br> Ratio F <br> Factors, Powers and Roots <br> F | Factors, Powers and Roots F <br> Graphs 1 F | Working in 3D F <br> Handling Data 2 F | Calculations 2 F <br> Graphs 2 F |
|  | 10 <br> Nurture Y3 | Formulae and Functions F Working in 2D F | Probability F <br> Measures and Accuracy F | Measures and Accuracy F <br> Stage 1 MathsGenie (F) | Stage 2 MathsGenie (F) <br> Stage 3 MathsGenie (F) | Stage 3 MathsGenie (F) <br> Stage 4 MathsGenie (F) | Stage 4 MathsGenie (F) <br> Stage 5 MathsGenie (F) |
|  |  |  |  |  |  |  |  |



| What key concepts /core skills / themes are covered each half term? | 7 | Sequences <br> Recognise, describe and predict terms in linear and non-linear sequences. Including pictorial, graphically and numerically. <br> Continue sequences. Explain the term-to-term rule of various sequences. Understand and use algebraic notation To use numerical and algebraic function machines to find inputs and outputs. <br> To understand algebraic notation. <br> To substitute into function machines. <br> To generate sequences given an algebraic rule Equality and equivalence Understand the mean of equality and an identity. Solve one-step equations. Understand like and unlike terms. <br> Simplify algebraic expressions. | Equality and equivalence Understand the mean of equality and an identity. Solve one-step equations. Understand like and unlike terms. <br> Simplify algebraic expressions. <br> Number: Place value and ordering integers and decimals <br> To understand the place value of integers and decimals. <br> To round to powers of 10 and significant figures. To order and compare integers and decimals. <br> Top position integers and decimals on numbers lines. To work out the median and range. <br> Number: Fraction, decimal and percentage equivalence <br> To represent hundredths and tenths. <br> To convert between basic FDP. <br> To understand the meaning of percent. To interpret pie charts. To identify equivalent fractions. | Number: Fraction, decimal and percentage equivalence <br> To represent hundredths and tenths. <br> To convert between basic FDP. <br> To understand the meaning of percent. To interpret pie charts. To identify equivalent fractions. <br> Solve problems with addition and subtractions <br> To understand the properties of addition and subtraction. <br> To add and subtract integers and decimals mentally and formally. To work out the perimeter. To solve financial problems. <br> To work with tables, timetables, frequency trees and bar and line charts. | Solve problems with multiplication and division <br> To understand the properties of multiplication and division. To multiply and divide integers and decimals formally. <br> To understand factors and multiples. <br> To use the order of operations. <br> To find the area of basic shapes. <br> To calculate the mean. <br> Fractions and percentages of amounts <br> To find percentages and fractions of amounts. To find the whole given a fraction. <br> To use a calculator to find a percentage of an amount. | Operations and equations with directed number <br> To understand the representations of negative numbers. To add, subtract, multiply and divide with negative numbers. <br> To evaluate algebraic expressions with directed number. <br> To solve two-step equations. <br> To use order of operations with negative numbers. <br> Addition and subtraction of fractions <br> To convert between mixed numbers and improper fractions. <br> To add and subtract fractions. <br> To use fractions in algebraic contexts. | Addition and subtraction of fractions <br> To convert between mixed numbers and improper fractions. <br> To add and subtract fractions. <br> To use fractions in algebraic contexts. Constructing, measuring and using geometric notation <br> To draw and measure lines and angles. <br> To recognize types of triangle and quadrilateral. To construct triangles and polygons. <br> To draw and interpret pie charts. <br> Developing geometric reasoning <br> To know and use angle facts about angles at a point, on a straight line, in a triangle and quadrilateral. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |


| $7-$ | Sequences <br> Nurture <br> Recognise, describe and <br> predict terms in linear and <br> non-linear sequences. <br> Including pictorial, <br> graphically and <br> numerically. <br> Continue sequences. <br> Explain the term-to-term <br> rule of various sequences. <br> Understand and use <br> algebraic notation <br> To use numerical and <br> algebraic function <br> machines to find inputs <br> and outputs. <br> To understand algebraic <br> notation. <br> To substitute into function <br> machines. <br> To generate sequences <br> given an algebraic rule <br> Equality and equivalence <br> Understand the mean of <br> equality and an identity. <br> Solve one-step equations. <br> Understand like and unlike <br> terms. <br> Simplify algebraic <br> expressions. |
| :--- | :--- |

Equality and equivalence Understand the mean of equality and an identity. Solve one-step equations. Understand like and unlike terms.
Simplify algebraic expressions.
Number: Place value and ordering integers and decimals
To understand the place value of integers and decimals.
To round to powers of 10 and significant figures. To order and compare integers and decimals. Top position integers and decimals on numbers lines. To work out the median and range.
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equivalence
To represent hundredths and tenths.
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Solve problems with addition and subtractions To understand the properties of addition and subtraction.
To add and subtract integers and decimals mentally and formally. To work out the perimeter. To solve financial problems.
To work with tables, timetables, frequency trees and bar and line charts.

Solve problems with multiplication and division To understand the properties of
multiplication and division. To multiply and divide integers and decimals formally.
To understand factors and multiples.
To use the order of operations.
To find the area of basic shapes.
To calculate the mean.

## Fractions and percentages

 of amountsTo find percentages and fractions of amounts. To find the whole given a fraction.
To use a calculator to find a percentage of an amount.

## Operations and equations

 with directed number To understand the representations of negative numbers. To add, subtract, multiply and divide with negative numbers.To evaluate algebraic expressions with directed number.
To solve two-step equations.
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To draw and interpret pie charts.
Developing geometric reasoning
To know and use angle facts about angles at a point, on a straight line, in a triangle and quadrilateral

Developing number sense
To know and use mental addition, subtraction, multiplication and division for integers, decimals and fractions.
To use factors and estimations.
To use number and algebraic facts to derive other facts.
Sets and Probability
To identify and represent sets and Venn Diagrams. To know the intersection and union of sets.
To know the vocabulary of probability.
To generate sample spaces.
To calculate probabilities. Prime numbers and proof To find and use factors and multiples.
To identify prime, square and triangular numbers. To find the HCF and LCM.
To write numbers as prime
factors.
To make and test conjectures.

## Prime numbers and proof <br> Multiplying and Dividin

 To find and use factors and multiples.To identify prime, square and triangular numbers. To find the HCF and LCM. To write numbers as prime factors.
To make and test conjectures.
Ratio and Scale:
Understanding ratio Solving problems in the form 1:n and n :m Dividing into a ratio Simplifying ratio Ratio and Fractions Pi and gradient as a ratio Multiplicative Change: Direct Proportion Conversion graphs Similar shapes Scale diagrams and maps Multiplying and Dividing Fractions:
Multiplying by an integer Multiplying fractions Dividing an integer by a fraction
Dividing fractions Reciprocals

Fractions:
Multiplying by an integer Multiplying fractions
Dividing an integer by a fraction
Dividing fractions
Reciprocals
Working in the Cartesian

## Plane:

Coordinates
ines parallel to the axes
$Y=x$ and $y-k x$ graphs
Gradient
$y-x+a$ graphs
Plotting $y=m x+c$ Representing Data: Scatter graphs Correlation Data types Frequency tables Two-way tables

## Representing Data:

 Scatter graphs Correlation Data types Frequency tables Two-way tables Tables and Probability: Sample spaces Two-way tablesVenn Diagrams Brackets, Equations and

## Inequalities

Algebraic expression
Directed number with algebra
Expanding and factorising brackets
Solving equations
Inequalities
Formulae, expressions, identities and equations

Brackets, Equations and Inequalities: Algebraic expression Directed number with algebra
Expanding and factorising brackets
Solving equations Inequalities
Formulae, expressions, identities and equations Sequences:
Generate sequences from words
Generating sequences from algebraic rule Nth term of a linear sequence Indices:
Multiplying indices
Dividing indices
Powers of powers
Fractions and Percentages:
Converting FDP
FDP of amounts
Increasing and decreasing
by a multiplier
Numbers as percentage and fraction of another number Percentage change

Fractions and Percentages: Converting FDP FDP of amounts Increasing and decreasing by a multiplier Numbers as percentage and fraction of another number Percentage change Standard Index Form: Powers of 10 Writing numbers in standard form Order numbers in standard form
Multiply and divide in standard form Add and subtract in standard form Number Sense:
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## Addition and subtraction of fractions <br> To convert between mixed <br> Developing geometric reasoning <br> To know and use angle

 numbers and improper fractions.To add and subtract fractions.
To use fractions in algebraic contexts.
Constructing, measuring

## and using geometric

## notation

To draw and measure lines and angles.
To recognize types of triangle and quadrilateral. To construct triangles and polygons.
To draw and interpret pie charts.
facts about angles at a point, on a straight line, in a triangle and quadrilateral.

## Developing number sense

To know and use mental addition, subtraction, multiplication and division for integers, decimals and fractions.
To use factors and estimations. To use number and algebraic facts to derive other facts.

## Sets and Probability

To identify and represent
sets and Venn Diagrams. To know the intersection and union of sets.
To know the vocabulary of probability.
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To identify prime, square and triangular numbers.
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form 1:n and n :m Dividing into a ratio Simplifying ratio Ratio and Fractions Pi and gradient as a ratio Multiplicative Change: Direct Proportion Conversion graphs Similar shapes Scale diagrams and maps Multiplying and Dividing Fractions:
Multiplying by an integer Multiplying fractions Dividing an integer by a fraction
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Dividing fractions Reciprocals Working in the Cartesian

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$Y=x$ and $y-k x$ graphs
Gradient
$y-x+a$ graphs
Plotting $y=m x+c$ Representing Data: Scatter graphs Correlation Data types Frequency tables Two-way tables

Tables and Probability: Sample spaces Two-way tables Venn Diagrams Brackets, Equations and Inequalities:
Algebraic expression Directed number with algebra
Expanding and factorising brackets
Solving equations Inequalities
Formulae, expressions, identities and equations

## Sequences:

Generate sequences from words
Generating sequences from algebraic rule Nth term of a linear sequence Indices:
Multiplying indices
Dividing indices
Powers of powers

## Indices:

Multiplying indices
Dividing indices
Powers of powers
Fractions and
Percentages: Converting FDP FDP of amounts Increasing and decreasing by a multiplier Numbers as percentage and fraction of another number Percentage change Standard Index Form:
Powers of 10
Writing numbers in standard form Order numbers in standard form
Multiply and divide in standard form Add and subtract in standard form Number Sense: Rounding Estimating Error intervals Order of operations Money and measures Calendar and time


Measure of Location: Mean from frequency tables
Outliers The range
Straight Line Graphs:
Plotting and reading

## graphs

Gradients and intercepts Equations of lines Further graphs Forming and Solving Equations:
Unknowns on one side Inequalities with negative numbers Unknowns on both sides Solving problems with equations and inequalities Rearranging formulae

Forming and Solving Equations: Unknowns on one side Inequalities with negative numbers
Unknowns on both sides Solving problems with equations and inequalities Rearranging formulae

## Three-Dimensional

## Shapes:

Into three dimensions Nets and other diagrams Surface area
Volume Constructions and

## Congruency:

 Constructions so far Introducing loc Perpendiculars More loci Congruence
## Numbers:

Working with numbers
Estimation
Solving problems with numbers
Fractions
Standard form Using Percentages: Percentage basics Reverse percentages Solving percentage problems Repeated percentage change Rotation and translation: Symmetry Rotations Translations and beyond Pythagoras' Theorem: Working with right-angled triangles Finding unknown sides Beyond triangles

| 9Nurture | Tables and Probability: <br> Sample spaces <br> Two-way tables <br> Venn Diagrams <br> Brackets, Equations and <br> Inequalities: <br> Algebraic expression <br> Directed number with <br> algebra <br> Expanding and factorising <br> brackets <br> Solving equations <br> Inequalities <br> Formulae, expressions, <br> identities and equations <br> Sequences: <br> Generate sequences from words <br> Generating sequences <br> from algebraic rule <br> Nth term of a linear <br> sequence <br> Indices: <br> Multiplying indices <br> Dividing indices <br> Powers of powers | Fractions and <br> Percentages: <br> Converting FDP <br> FDP of amounts <br> Increasing and decreasing <br> by a multiplier <br> Numbers as percentage <br> and fraction of another <br> number <br> Percentage change <br> Standard Index Form: <br> Powers of 10 <br> Writing numbers in standard form <br> Order numbers in standard form <br> Multiply and divide in standard form <br> Add and subtract in standard form <br> Number Sense: <br> Rounding <br> Estimating <br> Error intervals <br> Order of operations <br> Money and measures <br> Calendar and time | Angles in Parallel Lines and Polygons: <br> Angle notation <br> Alternate and <br> corresponding angles <br> Co-interior angles <br> Constructions <br> Properties of <br> quadrilaterals <br> Interior and exterior <br> angles of polygons <br> Area of Trapezia and <br> Circles: <br> Area of triangles, rectangles and parallelograms <br> Area of a trapezium <br> Perimeter and area of <br> compound shapes <br> Area of a circle <br> Line Symmetry and <br> Reflections: <br> Line symmetry <br> Reflecting in horizontal <br> lines <br> Reflecting in diagonal lines | The Data Handling Cycle: Questionnaires <br> Pictograms, bar charts and line graphs <br> Pie charts <br> Grouped data <br> The range <br> Measure of Location: <br> Mean, median and mode <br> Mean from frequency <br> tables <br> Outliers <br> Straight Line Graphs: <br> Plotting and reading <br> graphs <br> Gradients and intercepts <br> Equations of lines <br> Further graphs | Straight Line Graphs: <br> Plotting and reading graphs <br> Gradients and intercepts <br> Equations of lines <br> Further graphs <br> Forming and Solving <br> Equations: <br> Unknowns on one side Inequalities with negative numbers <br> Unknowns on both sides <br> Solving problems with equations and inequalities Rearranging formulae <br> Three-Dimensional <br> Shapes: <br> Into three dimensions <br> Nets and other diagrams <br> Surface area <br> Volume | Three-Dimensional <br> Shapes: <br> Into three dimensions <br> Nets and other diagrams <br> Surface area <br> Volume <br> Numbers: <br> Working with numbers <br> Estimation <br> Solving problems with <br> numbers <br> Fractions <br> Standard form <br> Using Percentages: <br> Percentage basics <br> Reverse percentages <br> Solving percentage <br> problems <br> Repeated percentage <br> change <br> Rotation and translation: <br> Symmetry <br> Rotations <br> Translations and beyond |
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| 10 Higher | Equations and Inequalities: <br> Solving Linear Equations Quadratic Equations Simultaneous Equations Approximate Solutions Inequalities <br> Circles and Constructions: <br> Circles 1 <br> Circles 2 <br> Circle Theorems <br> Constructions and Loci | Circles and Constructions: <br> Circles 1 <br> Circles 2 <br> Circle Theorems <br> Constructions and Loci <br> Ratio <br> Proportion <br> Ratio and scale <br> Percentage change <br> Factors, Powers and <br> Roots: <br> Factors and Multiples <br> Powers and Roots <br> Surds | Factors, Powers and <br> Roots: <br> Factors and Multiples <br> Powers and Roots <br> Surds <br> Graphs 1: <br> Equation of a Straight Line <br> Linear and Quadratic <br> Functions <br> Properties of Quadratic <br> Functions <br> Kinematic Graphs | Graphs 1: <br> Equation of a Straight Line <br> Linear and Quadratic <br> Functions <br> Properties of Quadratic <br> Functions <br> Kinematic Graphs <br> Working in 3D: <br> 3D Shapes <br> Volume of a Prism <br> Volume and Surface Area | Handling Data 2: <br> Averages and Spread 2 <br> Box Plots and Cumulative <br> Frequency <br> Scatter Graphs and <br> Correlation <br> Time Series <br> Calculations 2: <br> Calculating with Roots and Indices <br> Exact Calculations <br> Standard Form | Graphs 2: <br> Cubic and reciprocal <br> functions <br> Exponential and trigonometric functions <br> Real life graphs <br> Gradients and areas under <br> graphs <br> Equation of a circle |
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| 10 <br> Foundati on | Measures and Accuracy: <br> Estimation and <br> Approximation <br> Calcualtor Methods <br> Mesures and Accuracy <br> Equations and Inequalities: <br> Solving Linear Equations 1 <br> Solving Linear Equations 2 <br> Quadratic Equations <br> Simultaneous Equations Inequalities | Equations and Inequalities: <br> Solving Linear Equations 1 <br> Solving Linear Equations 2 <br> Quadratic Equations <br> Simultaneous Equations <br> Inequalities <br> Circles and Constructions: <br> Circles 1 <br> Circles 2 <br> Constructions <br> Loci | Circles and Constructions: <br> Circles 1 <br> Circles 2 <br> Constructions <br> Loci <br> Ratio <br> Proportion <br> Ratio <br> Percentage change <br> Factors, Powers and <br> Roots: <br> Factors and Multiples <br> Prime Factor <br> Decomposition <br> Powers and Roots | Factors, Powers and <br> Roots: <br> Factors and Multiples <br> Prime Factor <br> Decomposition <br> Powers and Roots <br> Graphs 1: <br> Drawing Straight Line Graphs <br> Equation of a Straight Line Kinematic Graphs | Working in 3D: <br> 3D Shapes <br> Volume of a Prism <br> Volume and Surface Area <br> Handling Data 2: <br> Frequency Diagrams <br> Averages and Spread 2 <br> Scatter Graphs and <br> Correlation <br> Time Series | Calculations 2: <br> Calculating with Roots and Indices <br> Exact Calculations <br> Standard Form <br> Graphs 2: <br> Properties of quadratic <br> functions <br> Sketching functions <br> Real-life graphs |


| 10 <br> Nurture | Formulae and Functions: <br> Basic formula <br> Substitution <br> Expanding Single Brackets <br> Simplifying <br> Rearranging Formula <br> Function Machines <br> Expanding Double Brackets <br> Complex Formula <br> Factorising Single Brackets <br> Factorising Double <br> Brackets <br> Deriving <br> Algebraic Vocabulary <br> Working in 2D: <br> Maps and Plans <br> Scale Drawing <br> Measuring Angles <br> Area and Perimeter <br> Unit Conversion <br> Reflections <br> Rotations <br> Translations <br> Enlargements <br> Bearings | Probability: <br> Likelihood <br> Probability Scale <br> Theoretical Probability <br> Experimental Probability <br> Relative Frequency <br> Bias <br> Sample Space <br> Mutually Exclusive and <br> Exhaustive <br> Measures and Accuracy: <br> Estimation and <br> Approximation <br> Calcualtor Methods <br> Mesures and Accuracy | Measures and Accuracy: <br> Estimation and <br> Approximation <br> Calcualtor Methods <br> Mesures and Accuracy <br> Foundation Stage 1 <br> Place Value <br> Time <br> Negative Numbers <br> Powers and Roots <br> BIDMAS <br> Factors and Multiples <br> Writing and Simplifying <br> Fractions <br> Coordinates <br> Pictograms | Foundation Stage 2 <br> Addition and Subtraction <br> Multiplication and Division <br> Rounding <br> Systematic Listing <br> Simplifying Algebra <br> Writing an Expression <br> Probability <br> Foundation Stage 3 <br> Calculation Problems <br> Fractions, Decimals and <br> Percentages <br> Using a Calculator <br> Substitution <br> Solving One Step <br> Equations <br> Area and Perimeter <br> Angles <br> Averages <br> Bar Charts <br> Stem and Leaf | Foundation Stage 3 <br> Calculation Problems <br> Fractions, Decimals and <br> Percentages <br> Using a Calculator <br> Substitution <br> Solving One Step <br> Equations <br> Area and Perimeter <br> Angles <br> Averages <br> Bar Charts <br> Stem and Leaf <br> Foundation Stage 4 <br> Function Machines <br> Frequency Polygons <br> Fractions of an Amount <br> Drawing Graphs <br> Percentages <br> Writing and Simplifying <br> Ratio <br> Fractions <br> Conversions and Units <br> Scale Drawings | Foundation Stage 4 <br> Function Machines <br> Frequency Polygons <br> Fractions of an Amount <br> Drawing Graphs <br> Percentages <br> Writing and Simplifying <br> Ratio <br> Fractions <br> Conversions and Units <br> Scale Drawings <br> Foundation Stage 5 <br> TBC |
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