Stage 7 Term 1a: Number

What are we learning about?

In this term we will be increasing our number skills and working with numbers of any size, including fractions, decimals and percentages. We will also learn how to check answers to calculations. We will also solve calculations and problems with decimals.

Why are we learning about it?

It is important to have the confidence and skill to use numbers and mathematical approaches in all aspects of life. We use numbers every day in all areas of our lives. Our confidence and ability with numbers impacts us financially, socially, and professionally. It even affects our health and wellbeing.

What new **KNOWLEDGE** will I gain?

You will learn how to solve and estimate problems which involve x and ÷ decimal numbers and calculate with mixed numbers. You will also learn how to +, -, x and ÷ with negative numbers. We will also solve problems involving highest common factors and lowest common multiples. You will extend your knowledge of percentages by increasing/decreasing an amount.

How does this build on the **SKILLS** I already have?

You extended your understanding of the number system and place value to include decimals, fractions, negative numbers and make connections between number relationships. You are also able to select and use appropriate calculation strategies to solve increasingly complex problems.

What new **SKILLS** will I develop?

You will develop how to use language and properties precisely to analyse numbers. This term you will also develop your use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics.

How does this build on the **KNOWLEDGE** I already have?

You have learnt how to work with numbers in millions. You already know about common factors, common multiples and common prime factors. You have also learnt how to +, -, x and ÷ with fractions and carry out calculations with decimals.

Stage 7 Term 1b: Number and Algebra

What are we learning about?

In this term we will be starting to develop more algebraic skills on using and manipulating expressions, equations and brackets. We will also be learning about rules on a set of axes.

Why are we learning about it?

Learning **algebra** helps to develop your critical thinking skills. That includes problem solving, logic, patterns, and reasoning. You **need** to know **algebra** for many professions, especially those in science and maths. ... When you solve that equation, you have **algebra** to thank!

What new **KNOWLEDGE** will I gain?

We will use and be able to interpret algebraic notation. We will learn how to write, simplify, expand brackets, substitute numbers into expressions. We will learn the difference between expressions and equations, where equations come from and how to solve an equation. We will learn about rules on a coordinate grid.

How does this build on the **KNOWLEDGE** I already have?

We learned how to simplify expressions and now we will learn how to expand brackets and simplify the expressions.
We will use a knowledge of order of operations to substitute into a variety of formulae.

What new **SKILLS** will I develop?

We will simplify expressions by expanding brackets and collecting like terms. We will solve 2 step equations, equations with brackets and equations with decimal or negative solution.
We will be able to Identify equations of simple lines.

How does this build on the **SKILLS** I already have?

We have used number skills with positive and negative numbers. We have been able to collect like terms and write simple expressions to represent a problem.

Stage 7 Term 2a: Statistics and Probability

What are we learning about?

In this term we will learn to read from some other types of graphs and charts. We will also look at how you carry out calculations that can be used to compare groups of data when the data is presented in a table.

Why are we learning about it?

Statistics is the science and, arguably, also the art of **learning** from data. As a subject it is concerned with the collection, analysis, and interpretation of data, as well as the effective communication and presentation of results relying on data. Probability is vitally important so that we can understand the chance of nature and the relative risk.

What new **KNOWLEDGE** will I gain?

We will learn how to calculate several averages and a measure of spread from a frequency table. You will also learn how to read from, draw and calculate averages from a Stem and leaf diagram. You will be able to answer questions and solve problems involving Venn diagrams. We will also look at what probability is and how we can calculate it.

How does this build on the **SKILLS** I already have?

You already were able to use language and properties precisely to analyse statistics using more advanced graphs and charts and averages and range.

What new **SKILLS** will I develop?

You will start to reason mathematically by exploring what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally. You will use language and properties precisely to analyse probability and statistics.

How does this build on the **KNOWLEDGE** I already have?

We learnt how to calculate several averages and a measure of spread. Averages included the mode, median and mean. You also learnt how to read from a pie chart, line graph, different types of bar charts and draw a line graph and bar charts. You were able to answer questions and solve problems involving charts and graphs.

TOPIC: Stage 7 2b
Geometry & measures

What are we learning about?

We will learn about using conventional notation for lines angles and shapes.
We will learn about the properties of angles involving parallel lines.
We will learn how to calculate the area of more complicated 2d shapes. We will learn about the different ways to look at 3D shapes and what they tell us about the object. We will learn how to calculate the surface area of a cube or cuboid.

Why are we learning about it?

The study of **shapes and space** is called "Geometry". This word comes from the ancient Greek and means "measuring the Earth". ... At school you start learning about simple **shapes**, like triangles, quadrilaterals and circles, and the way they relate to each other and the **space** in and around them.
The knowledge and skills that are gained throughout this topic will help us to solve a range of real life problems.

What new KNOWLEDGE will I gain?

You will learn to calculate the area of more complicated 2d shapes and solve problems involving these shapes. You will also learn how to calculate the surface area of cubes and cuboids. You will also learn how to draw the front, side elevation and plan of 3D shapes. You will also learn about alternate, corresponding and co-interior angles.

How does this build on the KNOWLEDGE I already have?

You learnt about the properties and parts of 2d shapes including a circle. You were able to draw 2d shapes given 1 or 2 sides.
We learnt how to calculate the area of a parallelogram and triangle.
You also learnt how to work out the volume of cubes and cuboids and calculate missing sides given the volume.
You learnt more about how to solve problems when rectangles have the same area or perimeter. You learnt more about angle properties within shapes and calculating missing angles

How does this build on the SKILLS I already have?

You have used language and properties to look at 2-D and 3-D shapes.
You started to develop your mathematical knowledge, in part through solving simple problems.

What new SKILLS will I develop?

You will use language and properties precisely to analyse 2-D and 3-D shapes and angles.
You will develop and use your mathematical knowledge to solve problems and evaluating the outcomes, including multi-step problems.

TOPIC: Stage 7 3a
Ratio, rate and proportion

What are we learning about?

You will learn about what a ratio is and how to write a ratio. We will learn how ratios, fractions and percentages are similar and different. We will learn how to divide an amount in a ratio and start to solve problems.
You will learn how to calculate the angle for a pie chart given frequencies.
You will also learn how to draw an accurate pie chart and solve more complicated proportional problems from a pie chart.

Why are we learning about it?

Ratios are used to compare values. They tell us how much of one thing there is compared to another. For example, **ratios** can be used to compare the number of girl puppies to boy puppies that were born.
A **proportion** is simply a statement that two ratios are equal. **Ratios** allow us to measure and express quantities by making them easier to understand.

What new **KNOWLEDGE** will I gain?

You will know how to divide a quantity in a ratio using a bar model. You will also be able to solve a range of ratio problems using a bar model eg given the ratio and the difference in quantity that this ratio represents.
You will learn how to construct an accurate pie chart given different total frequencies.

How does this build on the SKILLS I already have?

You extended your understanding of the number system; make connections between number relationships. You extended and formalised your knowledge of ratio and proportion in working with measures. You were be able to recognise when the structure of a numerical problem required additive, multiplicative or proportional reasoning.

What new SKILLS will I develop?

You will be able to select and use appropriate calculation strategies to solve increasingly complex problems. You will use language and properties precisely to analyse numbers and statistics. You will also begin to reason deductively in number. You will develop your mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.

How does this build on the KNOWLEDGE I already have?

You learnt how to write a ratio an to simplify a ratio. You learnt how to write an equivalent ratio. If you are given the cost of say 3 items you were able to work out the cost of 5 of the same items or 7 or 23 of the same items.
You were able to work out the cheapest way to purchase a quantity of items giving the cost of different quantities of the item.
You were also be able to order and solve problems relating to metric measures and time units.

TOPIC: Stage 7 3b
Number and algebra 2

What are we learning about?

You will learn about sequences of diagrams and numbers. There are different types of sequences that you will learn about. These are arithmetic, geometric and Fibonacci sequences. You will also learn more about transformations including enlarging a shape, more complicated reflections, rotations and translations on a set of axes.

Why are we learning about it?

Sequences of numbers, shapes and patterns are everywhere and used in lots of jobs such as clothes designers and architects.
Learning about sequences will help you spot patterns in other areas in everyday life and will mean you can start to predict what will come or happen next.

What new **KNOWLEDGE** will I gain?

You will know how to continue a range of different sequences given a few terms in the sequence. You will start to look at how number sequences are represented on a graph.
You will learn how to enlarge a shape in relation to a scale factor on a grid and on a set of axes. You will also learn how to reflect a shape in a horizontal, vertical or diagonal line given as an equation on an axes. You will also be able to translate a shape by a column vector.

How does this build on the SKILLS I already have?

You extended and formalised your knowledge of ratio and proportion in working with measures. You were be able to recognise when the structure of a numerical problem required additive, multiplicative or proportional reasoning. You developed your mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.

What new SKILLS will I develop?

You will learn how to move freely between different numerical, algebraic, graphical and diagrammatic representations.
You will extend your understanding of the number system; make connections between number relationships, and their algebraic and graphical representations.

How does this build on the KNOWLEDGE I already have?

You learnt how to reflect an object in an axes, rotate a shape by 90, 180 degrees clockwise or anticlockwise about a point on a grid. You also learnt how to translate an object a number of places across and up or down. You also spent some time enlarging increasingly complicated shapes by a positive whole number scale factor. You translated a shape by given how many across etc..