Stage 8 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 any calculation including decimals. We will also solve calculations and problems with powers and roots.

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 increase an amount by a percentage using a multiplier is a more efficient method.. You will also write a number as the product of its prime factors and use this to work out HCF and LCM. You will learn and use significant figures to round and estimate calculations.

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

You have started to 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.

What new **SKILLS** will I develop?

You will be able to select and use appropriate calculation strategies to solve increasingly complex problems. You will be able to move freely between fractions, decimals and percentages and apply this to different situations. You will also start to interpret when the structure of a numerical problem requires additive or multiplicative reasoning.

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

You learnt how to solve and estimate problems which involve x and ÷ decimal numbers using decimal places, nearest 10, 100 and calculate with mixed numbers. You also learnt how to +, -, x and ÷ with negative numbers. We will also solve problems involving HCF and LCM. You already know how to increase/decrease an amount by a percentage.

Stage 8 Term 1b: Number and Algebra

What are we learning about?

In this term we will be studying more advanced skills on using and manipulating expressions, equations and formulae with powers and brackets.

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?

Factorising, simplifying expressions involving powers, rearranging formulae, evaluating expressions including brackets and powers, expanding double brackets,
form and solve equations with unknown both sides.

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

We will start to combine together a number of the skills used in stage 7. This will mean that more steps will be needed to solve problems at this stage. We will also be working with the full range of types of number eg fractions, decimals, negative numbers, powers and roots.

What new **SKILLS** will I develop?

We will learn to develop fluency with algebra skills and develop your understanding on why we need to use algebraic techniques to solve problems.

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

We solved equations with unknown on 1 side, now we will solve equations with an unknown on both sides. In stage 7 we expanded 1 bracket but in this stage we will be expanding 2 brackets and also factorising 1 bracket which means put an expression back into a bracket.

Stage 8 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 grouped table. We will also use different ways to present 2 sets of data at one time including sample spaces, two way tables and scattergraphs.

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 grouped frequency table. We will also look at how to calculate probability from previous events and also when two events happen together. We will construct two way tables and frequency trees and answer probability questions from these. We will also look at the relationship between 2 quantities by drawing a scattergraph.

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

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

What new **SKILLS** will I develop?

You will continue to reason mathematically by exploring what can and cannot be inferred in statistical and probabilistic settings, and continue to express your 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 from a frequency table. You also learnt how to read from, draw and calculate averages from a Stem and leaf diagram. You were able to answer questions and solve problems involving Venn diagrams. We also looked at what probability is and how we can calculate it.

TOPIC: Stage 8 2b
Geometry & measures

What are we learning about?

You will learn how to calculate angles of a polygon. You will also learn how to calculate the circumference & area of circles and parts of circles.
You will also develop your knowledge to work out the volume of other prisms.
You will learn how to draw diagrams to scale & use bearings to plot and find places on a diagram in relation to other places.

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 how to calculate angles of a polygon including interior and exterior angles. You will also learn how to calculate the circumference & area of circles and parts of circles.
You will know how to work out the volume of other prisms and the surface area of triangular prisms.
You will learn how to draw and use scale diagrams and use bearings to plot and find places on a diagram in relation to other places.

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.

How does this build on the KNOWLEDGE I already have?

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

TOPIC: Stage 8 3a
Ratio, rate and proportion

What are we learning about?

You will learn about how to solve a wide range of multistage ratio problems.
You will learn how to use proportion methods, one of which is called the 'unitary method', to solve a range of problems that apply to everyday life.
The problems will cover 'best buy', converting currencies and recipe problems.
You will learn about how to calculate speed presented in different ways.

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. You will learn about different methods to solve everyday proportion problems.

What new **KNOWLEDGE** will I gain?

You will learn how to solve a range of multistage problems that involve sharing in a ratio. The problems will relate to other areas of Maths and everyday life.
You will learn how to work out which quantity of a product is the "best buy".
You will learn how to convert between different currencies and how to change recipes for different quantities of people.
You will be able to calculate speed in your head, using a calculator and from a graph.

How does this build on the SKILLS I already have?

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

What new SKILLS will I develop?

You will continue to be able to select and use appropriate calculation strategies to solve complex problems. You will extend and formalise your knowledge of ratio and proportion in working with measures and geometry. You will be able to interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning You will continue to 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 know how to divide a quantity in a ratio using a bar model. You already know how 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 have learnt how to decide on the cheapest way to buy eg 60 items giving the prices of different quantities.

TOPIC: Stage 8 3b
Number and shape

What are we learning about?

You will learn about sequences of diagrams and numbers. You will learn more detail about arithmetic sequences and how to write rules connecting the position to the value in the sequence. You will also learn more about transformations including enlarging a shape using a fractional scale factor. You will also learn to plot graphs of linear and quadratic graphs.

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 learn how to work out the relationship between the position of a term in a sequence and its value.
You will also see how sequences are linked to linear graphs given in the form eg y = 2x + 1. You will also learn how to plot quadratic graphs.
You will learn how to enlarge a shape in relation to a fractional scale factor on a grid and on a set of axes.

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 know how to continue a range of different sequences given a few terms in the sequence. You started to look at how number sequences are represented on a graph.
You learnt how to enlarge a shape in relation to a scale factor on a grid and on a set of axes. You also learnt how to transform a shape using reflection, translation and rotation.