Stage 11 Term 1a: Number and Algebra

What are we learning about?

In this term we will be increasing our number skills and working and learning about how to calculate with numbers in different forms including surds. We will also be learning about different methods of solving quadratic equations and increasing our knowledge of manipulating algebraic expressions and equations.

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 the difference between rational and irrational numbers, how to write the exact value of an irrational number as a surd and how to simplify and perform calculations with surds. You will also learn how to calculate roots and solve equations of a quadratic by various methods. You will also learn how to work out the UB and LB of calculations and give answers to appropriate degree of accuracy.

How does this build on the SKILLS I already have?

You have been able to move freely between different numerical representations.
You learnt to reason mathematically with decimals, fractions, powers, roots and percentages.
You were also able to select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems.

What new SKILLS will I develop?

You will be able to move freely between and make connections between different numerical, algebraic, graphical and diagrammatic representations. You will develop algebraic and graphical fluency, including understanding quadratic functions and be able to select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems.

How does this build on the KNOWLEDGE I already have?

You know how to write error interval of a number. You also know how to find the roots of a quadratic by using factorising. You already know how to calculate with fractions and solve simple algebraic fractional equations. You also know how to change the subject of a formula when the subject appears once.

RESILIENCE ASPIRATION SUCCESS

Stage 11 Term 1b: Algebra

What are we learning about?

In this term we will be studying more advanced skills on Algebra techniques that involve linear, quadratic and exponential algebraic techniques. You will learn how to combine all of your mathematical knowledge in a range of more advanced topics.

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?

You will learn how to solve quadratic or cubic equations by using an iterative method. You will also learn how to write the equation of a circle and by graphical and algebraic methods to solve when a linear and non linear equation cross. You will also learn about functions, composite and inverse functions and be able to solve problems. You will also use vectors to represent displacement in 2d.

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

We have learnt previously to develop fluency with algebra skills and develop your understanding on quadratic equations. You have also developed your skills in manipulating and using linear and quadratic graphs.

What new **SKILLS** will I develop?

You will use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships and develop algebraic and graphical fluency. You will also identify variables and express relations between variables algebraically and graphically. You will also be able to solve more complicated algebraic problems.

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

You know how to solve linear simultaneous equations. You know how to draw an exponential graph. You know how to represent a vector and calculate with vectors.
You know about roots, tangents, parallel and perpendicular lines.

Stage 11 Term 2a:
Statistics, Shape and measures

What are we learning about?

In this term we will learn to draw Histograms for unequal class intervals. We will learn about using Trigonometry rules to solve problems with non right angled triangles with 2D and 3D shapes. We will solve quadratic inequalities using roots and graphs.
We will also learn about what you can calculate from a velocity time graph.

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. Not all triangles are right angled triangles, learning this will mean we can solve all 2D and 3D shape problems quicker.

What new **KNOWLEDGE** will I gain?

You will learn to draw Histograms for unequal class intervals and estimate the median. You will learn about using Trigonometry rules to solve problems with non right angled triangles with 2D and 3D shapes. You will solve quadratic inequalities using roots and graphs.
You will also learn how you can calculate the rate of change from a graph eg velocity time graph and to be able calculate an estimate the distance covered.

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

You further developed what can and cannot be inferred in statistical and probabilistic settings, and to express your arguments formally. You regularly used language and properties precisely to analyse probability and statistics. You modelled situations mathematically and expressed the results using a range of formal mathematical representations.

What new **SKILLS** will I develop?

You will move freely between different numerical, algebraic, graphical and diagrammatic representations. You will model situations mathematically and express the results using a range of formal mathematical representations.
You will be able to identify variables and express relations between variables algebraically and graphically

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

We learnt how to draw histograms with equal class intervals. We know how to work out missing sides and angles in right angled triangles. We know how to solve linear inequalities and to represent the answers on a number line. Previously you learnt how to work out the gradient of a line. You have also learnt before how to interpret distance time graphs and working out speed and average speed.