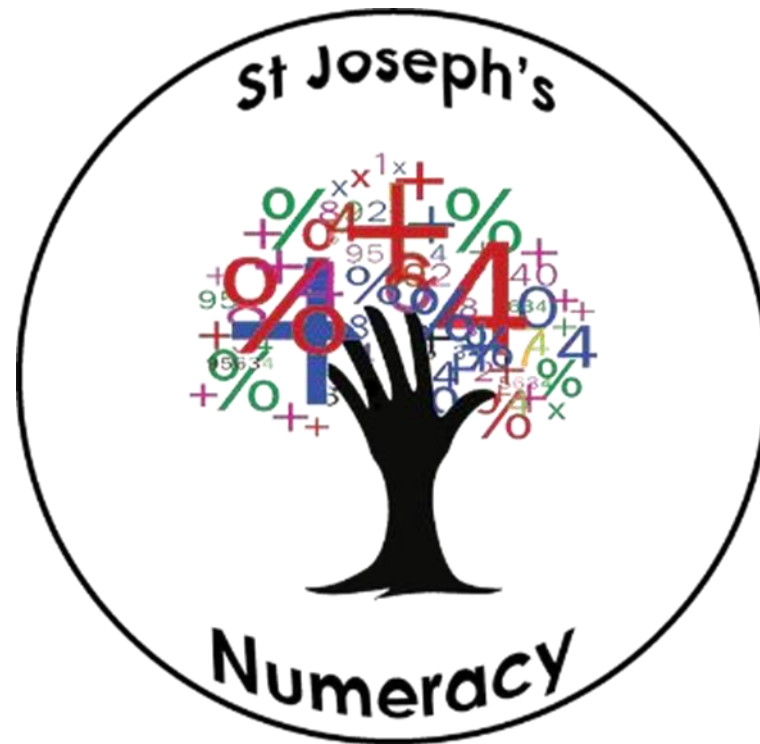# Year 8
Scheme of Work
2020-21

Vision:

- **To develop passionate, resilient problem solvers through the medium of mathematics.**

- **Instilling the necessary building blocks to allow pupils to unlock solutions and connections within mathematics.**

Key Points

- The Year 8 scheme of work comprises of an overview of topics covered during the year as well as a breakdown of the objectives covered within each unit. For each unit the objectives are split into PAL (Prior attainment lower), PAM (Prior attainment middle) and PAH (Prior attainment higher), to reflect the differentiation between and within the class sets. Numbers in brackets next to units suggest the number of lessons that could be used to cover that particular unit.
- The Year 8 SOW Resources folder comprises of lesson plan power points as well as resources that can be used for each unit. They are put in lesson order (e.g.L1 means lesson 1) to aid the usage of them in class.
- The online Resources folder is by no means an exhaustive list but a useful starting point for lesson planning. There are also resources in the Maths office consisting of textbooks, board games and TARSIA (jigsaw) puzzles.
- The curriculum follows a spiral format building and extending no the skills and knowledge acquired in Year 7.

Learning and Teaching

- **Blooms based learning objectives** are displayed during the lesson. This can be through 'one star, two star, three star' and inform the pupils how they will progress through the lesson and the skills they are using. These must acknowledge the target grades of all pupils within the class.

- **Mini White boards (MWBs)** – These can be used during Q&A sessions or for working out during games/main activities for pupils. It is a crucial tool to facilitating AfL in the class.

- **PIXL, MyMaths and Mathswatch** can be used to explain concepts in a manageable way, as well as to model examples.

Subscriptions

- www.mymaths.co.uk – (School login and password**: stjos, angle**) There are online lesson plans as well as student accounts so work can be set for them to complete independently in class or at home.

- http://www.mathsbox.org.uk/index1.php - **(sjchs, edge 20**) There are online starters, worksheets and activities that can be used in class.

- https://vle.mathswatch.co.uk/vle/ - online lesson videos as well as accompanying worksheets. This is particularly useful for setting cover work.

- PIXL MATHS-Username:SJ54,Password: #ESSENCE758SAT

- **PIXL MATHS APP** – Contains homework tasks and diagnostics tests.
  (School ID: SJ54, Userid: STAFF, Password: WEST 142

- **Mathswatch-Username-firstinitial.surname@st-jospehs**

Useful Websites

- http://prethomework.weebly.com/ - Source of PRET homeworks
- http://www.missbsresources.com/ - useful resources that can be used in lessons.
- http://corbettmaths.com/ - contains topic based assessments and online videos.
- www.mathedup.co.uk
- www.emaths.co.uk
- http://nrich.maths.org/public/
- http://justmaths.co.uk/
- www.mathsbot.com
- www.resourceholic.com
- Mrcartermaths.com
- [Tes.com](Tes.com)
- Maths4everyone.com
- Accessmaths.com
- Piximaths.co.uk
- Desmos

Year 8 Recommended Reads
Fermat's Last Theorem – Simon Singh
Murderous Maths

Year 8 Curriculum Overview 20-21

Autumn Term 1	Spring Term 1	Summer Term 1
1. Laws of Indices (6) Fractional/negative indices (PAH)	**6. Sketching Graphs (10)** Plotting linear graphs, y = mx + c, quadratic graphs (PAH)	**11. Rearranging Formulae (6)** Understanding inverse operations and its role in changing the subject.
2. Algebraic Thinking/Quadratics (6) Expanding and factorising, quadratics, DOTS, Substitution	**7. Interior/Exterior Angles and Constructions (6)** Interior and exterior angles, constructions	**12. Trigonometry (10)** Pythagoras' Theorem and Basic Trigonometry
3. Averages and Spread (6) Averages, frequency tables, grouped frequency tables (PAH)		
Autumn Term 2	**Spring Term 2**	**Summer Term 2**
4. Fractional thinking & Algebraic Fractions (6) Calculating with fractions and mixed numbers, simplifying and calculating with algebraic fractions	**8. Probability and Tree Diagrams** Theoretical probability, sample space diagrams, tree diagrams	**13. Compound Measures (7)** Speed-distance-time, Density-mass-volume
5. Forming and Solving Equations (6) Linear equations, equations with fractions, simultaneous equations (PAH)	**9. Perimeter, Area and Volume (6)** Area of compound shapes, Volume of prisms, circumference and area of circles	**14. House Prices Project**
	10. Standard Form (6) Multiplying/dividing by powers of ten, writing numbers and calculating in standard form	
Christmas Holidays	**Easter Holidays**	**Summer Holidays**

Year 8 Curriculum Context

Autumn Term 1	Spring Term 1	Summer Term 1
1. Laws of Indices (6) New Content that build on Year 7 skills of powers and roots	**6. Sketching Graphs (10)** New content that links to algebraic substitution in Unit 2 and Year 7. It allows pupils to appreciate the applied context	**11. Rearranging Formulae (6)** Connects to solving equations allowing pupils to appreciate a different perspective of algebra.
2. Algebraic Thinking/Quadratics (6) Embedding Year 7 content whilst extending into quadratics	**7. Interior/Exterior Angles and Constructions (6)** New content to Year 8 that will lay the foundations for GCSE Geometry	**12. Trigonometry (10)** Foundational GCSE content – essentials in Geometry and connects to Unit 11.
3. Averages and Spread (6) Embedding Year 7 content – notoriously a difficult skill for pupils to comprehend. The problem solving will be more advanced		
Autumn Term 2	**Spring Term 2**	**Summer Term 2**
4. Fractional thinking & Algebraic Fractions (6) Applying Year 7 content on fraction within an algebraic context connecting to Unit 2.	**8. Probability and Tree Diagrams** Connects Probability from Year 7 to Tree Diagrams	**13. Compound Measures (7)** Connected to Science and linked to Unit 10 and 11.
5. Forming and Solving Equations (6) Connect unit 2 and 4 introducing equations with fractions as well as extending into simultaneous equations.	**9. Perimeter, Area and Volume (6)** Embedding Year 7 content extending PAM students to circles and PAH to arcs and sectors.	**14. House Prices Project (Oral Presentation)**
	10. Standard Form (6) New content: Connected to Science and allows pupils to apply their knowledge of indices.	
Christmas Holidays	**Easter Holidays**	**Summer Holidays**

Assessment Plan

Exam assessments must be marked by the teacher. Class assignments may be self/peer assessed. Each class assignment and exam assessment will result in a percentage input on SIMS.

Assessment Schedule 20-21	Years 7,8,9,10	Year 12	Years 11, 13
Sept	Exam Assessment 1	PPE 1- Grade input (shortened version)	PPE 1 - Grade input (shortened version)
	CWA 1 (12th Oct)	**CWA 1 (3rd Nov)**	**CWA 1 (3rd Nov)**
Nov	Class Assignment 2 (Knowledge Recall)	Class Assignment 2 (Knowledge Recall)	Class Assignment 2 (Knowledge Recall)
Dec	Exam Assessment 2	Exam Assessment 2	Exam Assessment 2
	CWA 2 (14th Dec)	**School Deadline: 15th Dec**	**School Deadline: 15th Dec**
Jan	Class Assignment 3	PPE 2 – grade input	PPE 2 – grade input
Feb	Class Assignment 4		
	School Deadline – 11th Feb	**CWA 2 – 1st Feb**	**CWA 2 – 1st Feb**
March	Exam Assessment 3	Exam Assessment 3 (PPE Weaknesses)	Exam Assessment 3 (PPE Weaknesses)
	CWA 3 (29th March)	**CWA 3 (22nd March)**	**CWA 3 (22nd March)**
May	Class Assignment 5		
June	EOY Assessment	PPE 3 – Grade input	
	CWA 4 (6th July)	**CWA 4 (6th July)**	

Scheme of Work– Autumn Term

Unit 1 – Laws of Indices

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
- To understand the three main laws of indices, recognising the scenarios in which we can add, subtract and multiply powers respectively. - To be comfortable with expressions which require multiple rules to be used or multiple applications of the same rule. - To initially reflect on what happens when we have a power of 0, or a negative power, or when we multiply exponentiations with different bases.	- To leverage existing knowledge on the laws of indices in order to simplify expressions which require multiple rules to be used or multiple applications of the same rule. - To reflect on the power of 0 and negative powers. - To evaluate problems involving negative and fractional powers (1/3 etc)	- To leverage existing knowledge on the laws of indices in order to simplify expressions which require multiple rules to be used or multiple applications of the same rule. - To reflect on the power of 0 and negative powers. - To evaluate problems involving negative and fractional powers (1/3 etc) - To be able to raise a fraction to a power (including negative and fractional powers)	Ensure pupils understand the conditions win which rules apply (i.e. same bases) Extension: Index/Exponential equations
			Cross – Curricular Skills
			Key Vocabulary: Index, power, reciprocal, fractional, indices, evaluate
			Resources
			• TARSIA – indices

Key Questions/Activities:
- Investigating the power of zero.
- How do you solve an equation when your unknown is a power – do we still apply inverse operations?

Unit 2 – Algebraic Thinking/Quadratics

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
• To **simplify** algebraic expressions by collecting like terms. • To **multiply** algebraic terms together extending into squares. • **To simplify expressions by collecting like terms**.(including positive squares and cubes) • To **expand a** bracket in algebraic expressions. • To factorise basic linear expressions.	• To **simplify** algebraic expressions by collecting like terms • To **expand** single brackets and two sets of single brackets. • To **factorise** linear expressions extending into taking out a number and letter by **judging** what the highest common factor is. • To **expand out** double brackets involving negatives and **recognising** the basic properties of a quadratic in the form $ax^2 + bx + c$. • To **evaluate** expressions by substituting positive integers into algebraic expressions applying BIDMAS accordingly.	• To **simplify** algebraic expressions by collecting like terms • To **expand** single brackets and two sets of single brackets. • To **factorise** linear expressions **distinguishing** when there will a single and double term as the HCF. • To **expand out** double brackets involving negatives and **recognising** the basic properties of a quadratic in the form $ax^2 + bx + c$. • To **factorise** quadratic expressions in the form $x^2 + bx + c$. • To **understand** and apply difference of two squares. • To **evaluate** expressions by substituting positive and negative integers into expressions involving powers and employ a range of index and BIDMAS rules when required.	• When expanding employ multiplying arrows encouraging a systemic method, such as 'smiley face' method for double brackets. • Ensure pupils are aware of expanding and factorising being opposites. • Extension: Solving quadratic equations. **Cross – Curricular Skills** **Key Vocabulary:** Term, Expression, Equation, Formula, Function, Order, Operation, Algebra, Factorise, Brackets, Powers, substitution, Flow chart, Indices, Powers ☐ Cross reference substitution with football. **Resources** • TARSIA – factorising quadratics • TARSIA- substitution • TARSIA – indices

Key Questions/Activities
- Applying area/angles to apply algebraic equations
- To explore forming a quadratic expression from a given real life context.

Unit 3 – Averages and Spread			
Objectives – PAL	**Objectives – PAM**	**Objectives – PAH**	**Support and Challenge**
Understand the mode and range of a set of data **Identify** the mode and range from bar graphs **Identify** the median of a data set which has an odd number of pieces of data **Understand and calculate** the mean of a data set. **Identify** the **averages and range** of a data set which has an even number of pieces of data.	**Identify** the **averages and range** of a data set which has an even number of pieces of data. **Make comparisons by making distinctions** between the data pieces using the range and one other average. **Explain** the difference between continuous and discrete data **Know and comprehend** how to complete a frequency table for discrete data. **Calculate** the mean, mode and range from a frequency table.	**Calculate** the mean, mode and range from a frequency table. **Explain** the difference between continuous and discrete data **Know and comprehend** how to complete a frequency table for grouped data. - Identify the range, and modal class for grouped data, specifying their answer accurately. **Estimate the mean of grouped data, justifying** why the proposed method would only give them an estimation. **Carry out problems involving averages such as reverse mean.**	- Ensure that pupils see the link between a dataset and the dataset in table form. - Estimating a mean from a grouped frequency table is one of the most common errors within Mathematics. **Cross – Curricular Skills** Mean, Mode, average, median, range, frequency table, grouped frequency, inequality, estimate, frequency polygon, - Linked to data trends explored in Business, Economics and Geography. - Linked to graph sketching and tabulating in Science **Resources** - Maths Taboo – Data words

Unit 4 – Fractions/Algebraic Fractions

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
			• Ensure pupils gain an idea of estimating the size of parts.
• **Calculate** fractions of quantities. • **Compare** simple fractions **understanding** their relative quantities visually as well as fractionally. • **Understand** the concept of mixed numbers and improper fractions. • **Add and subtract** fractions with the **same denominator** • **Add and Subtract fractions** with different **denominators** • **Multiply and Divide** singular fractions.	• **Add and subtract** fractions with **different** denominators, utilising method of making one or both denominators the same appropriately. • To **multiply** fractions. • To **divide fractions** recalling the appropriate steps accordingly. • To **simplify** algebraic fractions by cancelling down. • To **apply** their numerical knowledge of calculating fractions with basic algebraic fractions	• To **add/subtract** fractions with **different denominators** and **expressed as mixed numbers** • Multiply/divide fractions extending into **multiplying/dividing mixed numbers** • **Divide/Multiply** a whole number by a fraction • To simplify algebraic fractions through cancelling down terms as well as common brackets. • To **apply** their numerical knowledge of calculating fractions with algebraic fractions	• Encourage pupils to be aware of what methods they prefer. Encourage them to make a consistent choice, to reduce confusion during exams. • Ensure pupils are aware that fractions compares part to whole whereas ratio compares part to part. • For PAH pupils extend fractions into algebraic fractions. **Cross – Curricular Skills** • Use real life examples from food technology to compare fractional quantities. **Key Vocabulary:** • Fraction, mixed, improper, quantity, multiply, divide, add, subtract, ratio, direct and inverse proportion • **Resources** Equivalent fractions tarsia • Percentage of amount board game

Unit 5 – Forming and Solving Equations

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
• **Understand** what an equation is. • **Solve** simple equations by **trial and error.** • **Know** how to check answers using **substitution.** • **Solve** two step equations adopting the inverse 'backwards journey' method. • Solve linear equations with 2 operations utilising Inverse operations and/or balancing method.	• **Solve** linear equations **with 2 operations utilising Inverse operations and/or balancing method** • **Know** how to **check** answers using substitution • **Solve equations** involving **division and fractions.** • **Solve equations** involving **brackets**, understanding the need for expansion before solving. • **Solve** equations with unknowns on both sides.	• **Solve linear equations containing brackets.** • **Solve** equations with unknowns on both sides understanding the need to eliminate an unknown on one side. • **Solve** equations with **brackets on both sides.** • **Construct and solve linear equations using an appropriate method.** • **Solve** simultaneous equations via elimination with the same coefficient on both unknowns • Solve simultaneous equations within a functional context.	• Encourage the value of checking answers via substitution. • As an extension link the term linear equation to its graphical representation.

Cross – Curricular Skills

Key Vocabulary:
Equation, balancing, elimination, substitution, linear, brackets, expand
• Link the use of linear equations to their graphical representation so that pupils can see their relevance in the real world.
• Use graphs from science or geography.

Resources

• Solving equations board game
• Solving equations TARSIA jigsaw puzzle
• Simplifying expressions TARSIA jigsaw puzzle
• Indices TARSIA jigsaw puzzle

Key Questions/Activities

Solving functional worded simultaneous equation problems.

What is the difference between equations with a fraction and equation with a part being a fraction?

Scheme of Work – Spring Term

Unit 6 – Sketching Graphs

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
• Read coordinates in the first quadrant • Plot coordinates in the first quadrant • Read coordinates in all 4 quadrants • Plot coordinates in all 4 quadrants • Find the equations of horizontal and vertical lines from a graph. • Draw a line from its equation using a table of values (One step equations)	• Plot and read coordinates in all four quadrants (extending into fractional coordinates) • Recognise the equations of horizontal and vertical lines • Find the equations of horizontal and vertical lines from sets of coordinates. • Recognise the graphs y=x and y=-x. • Draw a line from its equation using a table of values (One step equations) • Plot a line given its equation (2 step) by utilising a table of values. • Identify the gradient and y intercept from an equation.	• Find the equation of a line from their coordinates (e.g. x = 1, y = -3, y = x, y = 2x) • Draw a line from its equation using a table of values (two step equations) • Recognise the graphs y=x and y=-x. • Understand gradients – positive, negative and zero • Begin to understand how different parts of the equation effect the shape of a graph • Sketch graphs in the form of y = mx + c using their knowledge of how m and c affect a linear line. • Plot a quadratic graph from a table of values and understand the solutions to a quadratic are the places where the quadratic curve crosses the x axis (H)	• Use the coordinate grids on the IWBs for plotting coordinates as well as sketching lines. • Historically it is a difficult topic for pupils for grasp. Therefore ensure that constant feedback is given on assessments during the lessons as well as on homework tasks. • To save time, print blank coordinate grids for pupils to use when drawing graphs. **Cross – Curricular Skills** **Key Words** Axis, Axes, Co-ordinate, Horizontal, Vertical, Conversion, Slope, Steepness, Gradient, Intercept, Equation, Parallel, quadratic • Use graphs in science and geography to illustrate different types of graphs. • Use conversion graphs in business/economics to illustrate their real life relevance. **Resources** - Gridded paper - GeoGebra

Key Questions/Activities

What do nonlinear graphs look like – can this be predicted?

Unit 7 – Interior/Exterior Angles and Constructions

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
• Use a protractor correctly to measure and draw angles accurately up to 180 degrees. • Know and recognise an acute, obtuse, reflex, and right angle. • Estimate the size of angles. • Calculate missing angles from a right angle and straight line. • Identify and recognise different types of triangles. • Know and use the fact that the angles in a triangle add up to 180o	• Understand and apply angle facts within parallel lines to basic angle problems. • Understand how to find the sum of the interior angles in a polygon using triangles. • Calculating exterior angles from regular polygons. • Illustrate basic loci using a compass. (locus of a point and line) • Be able to bisect an angle and construct a perpendicular bisector	• Understand how to find the sum of the interior angles in a polygon using triangles. • Calculating exterior angles from regular polygons. • Understanding and utilising angle rules within parallel lines. • Creating and solving equations from angle problems. • Be able to illustrate basic loci using a compass. (locus of a point and line) • Be able to bisect an angle and use this to create other angles including an equilateral triangle using a set of compasses only. • To construct a perpendicular bisector	• For PAL pupils use turns to check their understanding of telling time. • Embed understanding that exterior and interior lie on the same line

Cross –Curricular Skills

Key Vocabulary
• Turning, Rotation, Clockwise, Anti-clockwise, Symmetry, Acute, Obtuse, Reflex, Right-Angle, Perpendicular, Protractor, Estimate, Order of rotational symmetry, Angle, Degrees, Vertically Opposite, Isosceles, Equilateral, Scalene

• Turns used in design and technology

Resources
• Compasses and Protractors in each classroom.

Key Questions/Activities

Can you derive a formula for the sum of interior angles within different polygons?

How can you calculate the no. of sides of a polygon given its interior angle?

Unit 8 – Probability and Tree Diagrams

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
• Use the words certain, impossible, likely and unlikely and give examples of such events from experience • Understand and give examples of events that have an even chance • Know and use the probability scale from 0 to 1 • Calculate basic single event probabilities simplifying the fractional answers.	• Calculate single event probabilities with equally likely outcomes expressing their answers as fractions, decimals or percentages. • Calculate the probability of something not happening using the idea of probabilities adding up to 1. • Identify and list all the possible outcomes of an experiment • Calculate probabilities from combined events using sample space diagrams.	• Calculate probabilities with equally likely outcomes (single event), using sample space diagrams for combined events. • Understand the use of tree diagrams and utilise it to calculate probabilities from multi events (unconditional events)	• Ensure they use the correct terminology when describing probabilities. Refrain from using '50-50'. • Soft die are in the maths office. • Use the horse race activity to show multi events. • Emphasise the need to answer probability problems numerically. • Emphasise probability notation particularly with PAH pupils. ☐ **Key Words** Certain, Possible, Impossible, Chance, Probability, Likely, Unlikely, Outcomes, Even chance, Experimental probability, data, Likelihood **Resources** ☐ Horse Race – online staff area

Key Questions/Activities:
Should you insure your phone (nrich task)

Unit 9 – Perimeter, Area and Volume

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
• Identify and recognise basic 2D and 3D shapes. • Understand perimeter and use the correct units • Understand area and use the correct units • Know and utilise the formula for finding the area of a rectangle and squares. • Know and utilise the formula for finding the area of triangles and parallelograms • Understand volume and use the correct units • Know and utilise the formula for finding the volume of cuboids.	• Calculate the perimeter of compound shapes made from rectangles. • Calculate the area of compound shapes made from rectangles. • Know and utilise the formula to find the area of a triangles and parallelograms and trapeziums. • Create solutions to finding the area of compound plane shapes including shaded areas. • Know and utilise the formula for finding the volume of cuboids and triangular prisms.	• Know and use the formula to find the area of parallelograms, triangles and trapeziums. • Create solutions to finding the area of compound plane shapes included shaded areas involving triangles and trapeziums. • Know and utilise the formula for finding the volume of cuboids and triangular prisms. • Utilise the formula for finding the circumference and area of circles. • Utilise formulae to work out parts of circles **(including arcs and sectors).** • **To calculate** the volume of cylinders.	• Mini whiteboards. • Displays for learning • Cm cubes to illustrate concept of volume being the number of cm cubes that can fit into a 3D shape. • Emphasise the importance of units. ☐ **Key Words** Perimeter, area, Space, Volume, rectangle, Cuboids, Cube, Square, Formula, Compound Shapes, Triangle, Capacity, Surface Area **Resources** ☐ Multi link cubes (Maths office)

Key Questions/Activities

Proof of the area of a trapezium

Playground activity – circumference of circle

Unit 10 – Standard Form

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
- Multiply and divide by powers of ten including decimals. - Understand why putting numbers in standard form is useful (particularly in Science). - Be able to use the x10^ button on your calculator. - Convert large numbers to and from standard form. - Multiply and divide numbers in standard form. - Add and subtract numbers in standard form.	- Understand why putting numbers in standard form is useful (particularly in Science). - Be able to use the x10^ button on your calculator. - Convert large and small numbers to and from standard form. - Multiply and divide numbers in standard form. - Add and subtract numbers in standard form.	- Understand why putting numbers in standard form is useful (particularly in Science). - Be able to use the x10^ button on your calculator. - Convert large and small numbers to and from standard form. - Multiply and divide numbers in standard form. - Add and subtract numbers in standard form.	• Mini whiteboards. • Displays for learning Extension: For PAH pupils ensure they recognise the significant of the negative power for small numbers. **Key Words** Standard, index form, reciprocal, bacteria **Resources** TARSIA puzzle

Key Questions/Activities

Scheme of Work – Summer Term

Unit 11 – Rearranging Formulae

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
• To recall solving one and two step equations. • To understand the significance of inverse operations. • To apply inverse operations to changing the subject (two steps)	• To rearrange basic formulae involving up to two steps. • To rearrange equations involving brackets and fractions	• To rearrange basic formulae involving up to three steps • To rearrange formulae that involve brackets and denominators	• Mini whiteboards. • Displays for learning • Ensure pupils are proficient with solving linear equations before rearranging.

Support and Challenge

- Mini whiteboards.
- Displays for learning
- Ensure pupils are proficient with solving linear equations before rearranging.

Literacy/Cross-curricular Focus:

Key Vocabulary:
Equation, balancing, rearrange, subject, inverse

- Link the use of linear equations to their graphical representation so that pupils can see their relevance in the real world.
  - Use graphs from science or geography.

Resources

Key Questions/Activities

Unit 12 – Trigonometry (Right Angled Triangles)

Objectives – PAL	Objectives – PAM	Objectives – PAH	Support and Challenge
To recall calculating missing sides from a right angled triangle employing Pythagoras' Theorem.	• To understand sin/cos/tan ratio. • To apply SOHCAHTOA to calculate missing sides and angles of a right angled triangle. • To apply basic trigonometry to problem solving questions involving compound shapes.	• To understand sin/cos/tan ratio. • To apply SOHCAHTOA to calculate missing sides and angles of a right angled triangle. • To apply basic trigonometry to problem solving questions involving compound shapes. • To solve problems by constructing a diagram and then applying trigonometry appropriately.	• Mini whiteboards. • Displays for learning • Employ formula triangles to assist with rearrangement. They will need coaching in utilising the formula triangle. **Literacy/Cross-curricular Focus:** **Key Vocabulary:** **Sine, Cosine, Tangent, angle, pythagoras** • Engineering **Resources** Treasure hunt activity

Key Questions/Activities

Unit 13 – Compound Measures	
Objectives	**Support and Challenge**
- Understand how to utilise a formula triangle - Solve simple problems involving (average) speed, distance and time. - Create basic distance/time graphs. - Understand the gradient of a distance time graph is the gradient. - Solve problems involving density, mass and volume (which can extend to volumes of prisms and cuboids). (PAH) Solve more complex problems involving speed, distance and time, including with multiple phases of a journey, or an algebraic element.	- Mini whiteboards. - Displays for learning - Link use of formula triangle to trigonometry. - Prior check – straight line graphs

Literacy/Cross-curricular Focus:
Key Vocabulary: Speed, distance, time, density, mass, volume, formula triangle,   - Use graphs from science or geography.   - Team teaching with Science department
Resources Visualiser – IPAD stand

Key Questions/Activities

House Prices Project

- Two investigations into houses and house prices, exploring collection of data/designing a survey, and analysing/interpreting/representing data.
- Investigation 1 compares the homes of students to those in London.
- Investigation 2 investigates what factors affect London house prices.

Support and Challenge

Literacy/Cross-curricular Focus:

Key Vocabulary:

- Business studies, data analysis in Sciences and Geography

Resources