KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning
Year 7 – Term 3/Unit
Conversion/BIDMAS/Rounding/Powers&Roots/Circles/Balancing Equations

Intent – Rationale

This term students get to challenge themselves with some new maths! Ranging from the beginnings of solving equations to using new symbols such as pi and operations such as rooting.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
• KS2 unit metric unit conversion • Year 7 Term 1 written methods, Term 2 substitution • KS2 rounding and estimation, Year 7 Term 1 written methods estimating • Year 7 Term 2 algebraic expressions, square terms • Year 7 Term 1 perimeter and area, KS2 area of a circle • Year 7 Term 2 algebraic expressions, KS2 balance puzzles	• Year 7 Term 3 measurement calculations and circles • Year 7 Term 3 substitution in to formulae • Year 7 Term 3 circles, rounding to given degree of accuracy when calculating with pi • Year 8 Term 1 expressions and identities (brackets) • Year 8 Term 1 area and perimeter including circles
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
Design and Technology • Metric unit conversions for designs • Designs involving circles Science • Rounding measurements • Balancing chemical equations • Powers and standard form Art	• GB4a)e)f)g)h)i)

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• Appreciation of shape and their properties for creating images	
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**
• Infinite Powers: The Story of Calculus - The Language of the Universe - Steven Strogatz • Storybook Math - Simple Equations - Mark Gregory • The Simpsons and Their Mathematical Secrets – Simon Singh • Sir Cumference and the Dragon of Pi by Cindy Neuschwander	• It is important students set out the workings vertically in solving balance equations and that teachers use the language of "inverse" operations to "both sides" to keep the equations "balanced". Avoid language such as "put on the other side"

Mathematics Scheme of Learning
Year 7 – Term 3

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?

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National Curriculum references:

Use compound units such as speed, unit pricing and density to solve problems, use standard units of mass, length, time, money and other measures, including with decimal quantities

Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals, recognise and use relationships between operations including inverse operations

Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]

Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations

Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes

Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)

Know

Convert between different metric measurements. Convert between imperial and metric measurements. Use a conversion graph.

Know square numbers 1-15 and cube numbers 1-5. Round to the nearest multiples of 10 and decimal places. Use BIDMAS in calculations.

Know the parts of a circle. Know and use the formula for area of a circle and circumference of a circle.

Solve balance equations. Solve one step and two step linear equations (no brackets, term 1 year 8).

Apply

Conversion graph to convert distance and money in context questions. Which is bigger? Smaller? Comparing measurements with different units.

Measurement calculations.

Circle context problems.

Form and solve linear equations e.g. I'm thinking of a number

Extend

Comparing measurement sizes using inequalities

BIDMAS problems with squares and cubes

Fraction of a circle e.g. semi-circle and ¼ circle – area only. Compound shapes with circle parts.

Form and solve two step linear equations

What subject specific language will be used and developed in this topic?	**What opportunities are available for assessing the progress of students?**

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Unit, measurement, metric, imperial, centimetre, kilometre, metre, millimetre, inch, foot, yard, litre, millilitre, capacity, length, distance, miles, kilogram, grams, pounds, stones, ounces, weight, mass, conversion, convert, equivalent. Square number, square root, cube number, cube root, power, indices, index, multiply, calculation Circle, semi-circle, circumference, radius, diameter, tangent, chord, segment, sector, arc, centre, area, pi, compound. Equation, linear, balance, equivalent, inverse operation, solve.	• End of term unit test • Mid Term marking targets • Units – what do we see measured in imperial (e.g. distance on signs, weight of babies) or in metric (bottles of coke) • Common misconceptions: • Confusing formula for area of circle and circumference of circle

Unit Conversion	R	A	G
Convert between different metric measurements			
Convert between different units of measurement			
Interpret a conversion graph			

Calculations	R	A	G
Know square numbers and roots for 1-15			
Know cube numbers and roots for 1-5			
Round to the nearest			
Round to a given number of decimal places			
Know BIDMAS and use when calculating			
Work out calculations with measurements			

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Circles	R	A	G
Know the parts of a circle			
Calculate the circumference of a circle			
Calculate the area of a circle			

Equations	R	A	G
Solve balance equations			
Solve one step linear equations			
Solve two step linear equations			

Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
Unit Conversion	Convert between different metric measurements	Which is bigger? Smaller? Using inequalities	KMB Y7 Unit Conversion PPT
	Convert between different units of measurement	Which is bigger? Smaller? Using inequalities in calculations.	
	Interpret a conversion graph	In context, who went further? Where did it cost more?	
Calculations	Know square numbers and roots for 1-15	Know square numbers and roots for 16-20	KMB Y7 Calculations PPT
	Know cube numbers and roots for 1-5	Explain how to calculate higher cubed numbers as well as negative numbers	

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	Round to the nearest	Use to estimate calculations	
	Round to a given number of decimal places	Use to estimate calculations	
	Know BIDMAS and use when calculating	Including squares and cubes Include algebraic equations	BIDMAS Cities
	Work out calculations with measurements	In context-worded problems Algebraic questions	
Circles	Know the parts of a circle	Research language of a circle- where do the terms circumference, diameter etc come from?	KMB Y7 Circles PPT
	Calculate the circumference of a circle	Different units, radius/diameter problems Circumference calculations with algebra	Discover the ratio pi
	Calculate the area of a circle	Compound shapes, ½ and ¼ circles Area calculations with algebra	
Equations	Solve balance equations	Shapes instead of letters Creating and solving own equations - what makes a good/challenging equation?	KMB Y7 Equations PPT
	Solve one step linear equations	Form and solve Worded questions Creating and solving own equations - what makes a good/challenging equation?	

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	Solve two step linear equations (no brackets)	I'm thinking of a number - form and solve equation Creating and solving own equations - what makes a good/challenging equation?	Starter: Substitute and Solve