

KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning

Year 9 – Term 2/Percentages/Probability/Polygons/Compound Measures

Intent – Rationale

With mathematics being taught in a cyclic format, this term provides a balance of recap, preparation for GCSE and an opportunity for application and discussion on a cross curricular level.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
<ul style="list-style-type: none"> • Year 8 term 3 percentage increase/decrease using multipliers • Year 8 term 6 theoretical probability, expected frequency, AND OR rules (HSL) • Year 8 Term 5 polygons (HSL angles in polygons) • Compound Measures in Physics 	<ul style="list-style-type: none"> • Year 9 Term 5 reverse percentages using multipliers, compound interest • GCSE conditional probability • GCSE polygon problems • GCSE compound measures and error interval problems e.g. decision making on safety limits.
What are the links with other subjects in the curriculum?	What are the links to SMSC, British Values and Careers?
<p>Art</p> <ul style="list-style-type: none"> • Mathematical ideas of pattern and shape <p>Design and Technology</p> <ul style="list-style-type: none"> • Percentage calculations <p>Music</p> <ul style="list-style-type: none"> • Speed and time – beats per minute <p>PE</p> <ul style="list-style-type: none"> • Speed/distance/time calculations <p>Science</p> <ul style="list-style-type: none"> • Percentage calculations • Compound Measures -SDT/DMV/PFA 	<ul style="list-style-type: none"> • GB4e - Solving real life problems, a chance to put new skills in to context and reflect on how mathematics is relevant to everyday life • SP3 – Creativity in learning (probability games, polygon investigations)

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What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	What are the opportunities for developing mathematical skills?
<ul style="list-style-type: none"> • ‘Mad for Math: Maths adventures using fractions, percentages and decimals’ – Linda Betola 	<ul style="list-style-type: none"> • Discussion around impact of changing variables in compound measures • Applications to financial mathematics • New notation – sets, Venn diagrams and tree diagrams

Mathematics Scheme of Learning Year 9 – Term 2

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?
<p><u>National Curriculum reference:</u></p> <p>Work interchangeably with terminating decimals and their corresponding fractions (such as $\frac{7}{2}$ and 3.5 or 0.375 and $\frac{3}{8}$). Define percentage as ‘number of parts per hundred’, interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100%</p> <p style="text-align: center;">Interpret fractions and percentages as operators.</p> <p>Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale. Understand that the probabilities of all possible outcomes sum to 1. Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams. Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities.</p> <p style="text-align: center;">Use compound units such as speed, unit pricing and density to solve problems.</p> <p>Understand and use place value for decimals, measures and integers of any size. Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥. Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative</p> <p style="text-align: center;"><u>Know</u></p>

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Use written methods to add and subtract fractions and decimals. Find fractions and percentages of a given amount using non-calculator methods. Use multipliers to increase/decrease an amount by a given percentage. Calculate repeat percentage change.

Understand experimental vs theoretical probability. Be able to work out the relative frequency and identify bias and most reliable experimental probability. Calculate the expected frequency using theoretical or experimental probability. Draw and use a Venn diagram to calculate probability of combined events. Draw and use a probability tree diagram to calculate the probability of combined (independent) events.

Know and use angle facts in parallel lines and on a straight line. Calculate interior and exterior angles in polygons.

Know and use the formulae for SDT, DMV and PFA.

Apply

Worded problems including bank interest and depreciation in value.

Calculate the number of sides when given an interior/exterior angle of a regular polygon. Solve problems including decision making with shape tessellation.

Solve SDT, DMV, and PFA problems.

Extend

Research percentage interest earned and gained.

Draw and use a tree diagram for dependent events.

Create a polygon tessellation.

Discussion around impact of increased/decreased area on pressure and force. Discussion on SDT inversely proportional relationship.

What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?
<p>Fraction, decimal, improper fraction, place value, percentage, percent, multiplier, increase, decrease, depreciation, repeated, interest, simple interest, percentage change.</p> <p>Theoretical, experimental, expected frequency, relative frequency, trial, outcome, event, combined events, independent events, dependent events, probability tree diagram, Venn diagram, intersection, union, set.</p>	<ul style="list-style-type: none"> • End of term unit test • Mid Term marking targets <p>Misconceptions include:</p> <ul style="list-style-type: none"> • Forgetting to multiply the numerator when finding a common denominator

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<p>Polygon, interior, exterior, regular, irregular, angle, tessellate, angles around a point, parallel, perpendicular, corresponding, alternate, co-interior, supplementary.</p> <p>Compound, measure, density, pressure, force, area, volume, speed, distance, time, units, formula, formulae, minimum, maximum, safely, error interval, significant figures, decimals places, greatest, least, metric, imperial</p>	<ul style="list-style-type: none"> When working with probability trees pupils forget to 'multiply probabilities when going across and add probabilities when going down
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Percentages and Fractions	R	A	G
Add and subtract fractions			
Add and subtract decimals			
Find fractions and percentages of amounts			
Find the amount for a given percentage change using multipliers			

Probability	R	A	G
Understand experimental vs theoretical probability			
Calculate the relative frequency			
Use a Venn diagram to calculate the probability of an outcome			
Draw a probability tree diagram for independent and dependent events			

Properties of Polygons	R	A	G
Use the sum of angles in a triangle			
Use the sum of angles in a polygon			
Use the sum of angles on a straight line			
Calculate the interior and exterior angles in a polygon			

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Apply the properties of squares, rectangles, parallelograms, trapeziums, kites and rhombus			
Solve algebraic problems with interior and exterior angles			

Compound Measures	R	A	G
Know and use the formula for calculating speed, distance and time			
Know and use the formula for calculating density, mass and volume			
Use a conversion graph			
Round to significant figures			
Write the error interval for a rounded value			
Finding the min/max for a calculation			