KESTEVEN AND SLEAFORD HIGH SCHOOL

Mathematics Scheme of Learning

Year 8 – Term 6/Volume/Probability/Congruency/Transformations

Intent – Rationale

Pupils are familiar with probability scale, and can calculate simple theoretical probabilities. Pupils have also studied experimental probability which will be recapped and focus on terminology of relative frequency then explored. Learning the OR and AND rule for combined events will take place. Pupils will also systematically list outcomes in a sample space diagram.

Pupils will recap their knowledge of finding the area of basic shapes (rectangles, parallelograms, circles and triangles) and be able to explain how finding the area of any 2D shape can help to find the volume of any 3D shape if we know its cross section (spheres, cones and pyramids will not be covered). Pupils will recap the four types of transformations and how to apply these including being able to fully describe a transformation that has already taken place, listing all key information; some pupils will apply this to negative and fractional enlargements. Congruency is a new topic and will

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
• Year 8 Term 1 Area • Year 7 Term 2 probability, Year 8 Term 3 fractions • Year 8 Term 3 angle notation • Year 7 Term 1 symmetry, KS2 transformations, Year 8 Term 6 congruency, Year 8 term 2 straight line graphs	• Year 9 Term 5 Volume • Year 9 Term 2 probability • Year 8 Term 6 transformations, Year 9 Term 4 construction triangles • GCSE transformations
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
Art • Transformation/tessellation of shapes (Escher) Design and Technology • Construction and transformations strands of shape, space and measures Science • Metric units	• GB4ef
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**

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• 'Alex's Adventure in Numberland' - Alex Bellows • 'The Math Book' - Clifford Pickover	New language around congruency. Development of spacial awareness, including reflecting and rotating objects.

Mathematics Scheme of Learning
Year 8 – Term 6

Intent – Concepts

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

National Curriculum reference:

Derive and apply formulae to calculate and solve problems involving volume of cuboids (including cubes) and other prisms (including cylinders).
Calculate probabilities of events with equally likely outcomes. Calculate probabilities of events not occurring by understanding that the probabilities of all possible outcomes sum to 1. Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities
Draw accurate reflections on squared paper and by using co-ordinates with or without tracing paper. Investigation of reflections within shapes, on isometric paper and repeated reflections. Rotate shapes through angles which are a multiple of 90^{o}, be able to fully describe a rotation. Enlarge a shape by a scale factor with and without a centre of rotation including negative and fractional enlargements, be able to fully describe an enlargement.

Know

The formula for the area of basic shapes. Know and use the formula for the volume of a prism. Draw the net of a 3D shape. Draw 3D shapes on isometric paper.
Use probability notation to calculate theoretical probabilities of single and combined events. List outcomes systematically including with a sample space diagram.
Calculate the expected frequency
Know the 4 conditions of congruency. Use to identify congruent triangles.
Describe and draw objects using the 4 transformations separately and combined.

Apply

Find the volume of compound prisms. Solve capacity and other volume problems.

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Extend

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Find a missing dimension when the volume is known. Explain why two triangles are congruent, using angle facts. Draw enlargement with a negative scale factor. Describe reflections giving the equation of the mirror line (not x/y axis or y=x).	
What subject specific language will be used and developed in this topic?	**What opportunities are available for assessing the progress of students?**
Volume, cross-section, area, depth, height, length, squared metres, cubic metres, capacity. Equally likely outcomes, chance, likelihood, expected frequency, theoretical probability, experimental probability, relative frequency, estimate, mutually exclusive, sample space diagram. Outcomes, trial, event. Systematic. Congruent, similar shapes, condition, orientation. Rotate, reflect, enlarge, scale factor, vector, translate, centre of rotation, centre of enlargement, mirror line, rays, object, image, clockwise, anticlockwise.	• Half term unit test • Mid-term marking targets

Volume	R	A	G
Calculate the area of basic shapes including trapeziums and circles			
Use formulae to calculate the volume of a prism			
Solve volume problems including capacity problems			
Draw and label the net(s) for 3D shapes			
Draw 3D shapes on isometric paper			

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Probability	R	A	G
Calculate the theoretical probability of an event occurring			
Calculate the expected frequency			
Calculate the probability of combined events using the OR and AND rule			
List possible outcomes systematically, including with sample space diagrams			

Congruency	R	A	G
Know the 4 conditions of congruency			
Identify congruent triangles			
Give reason to congruent shapes			

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Transformations	R	A	G
Draw and describe translations			
Draw and describe reflections in vertical or horizontal lines			
Draw and describe rotations with centre (0,0)			
Draw and describe enlargements with positive or fractional scale factors			
Draw combined transformations			

Introduction to Factorising	R	A	G
Recap: how to find the HCF			
Recap: explain the difference between expression, equation and formulae. Expanding single brackets.			
Be able to factorise by common factors in to a single bracket			