SUBJECT: Geometry

CURRICULUM PROGRESSION PATHWAYS

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SUBJECT: Geometi) 001	RICULUM PROGRES	SIONTAINWATS	CL. MISS L. B	raashaw ana Miss A. Hazeli		
<u>Year 7</u>	<u>Year 8</u>	Year 9	KS4 Foundation pathway	KS4 Higher pathway	KS5 (Level 3)	Further Education and training	Careers
 2D Shapes Identify and name different 	 2D Shapes Name different polygons and 	2D Shapes 3D Shapes	 2D Shapes Identify parallel and 	 2D Shapes Identify parallel and 	2D + 3D ShapesApply formulas for area	Natural Sciences	Actuarial Science
triangles and	how to classify them	Calculate the volume and	perpendicular lines	perpendicular lines	and volume in different contexts	Engineering	 Aeronautical Engineering
 quadrilaterals Work out the perimeter of composite shapes and polygons Find areas of irregular shapes by counting squares Calculate areas of rectangles and rectilinear shapes 3D Shapes Angles Use a protractor to measure and draw angles Recognise types of angles Estimate the size of angles Identify angle and side properties for triangles on a straight line, 	 them Derive and use the formula for area of triangle Calculate the area of compound shapes made up of triangles and rectangles Derive and use the formula for area of parallelograms and trapeziums 3D Shapes Classify and name 3D shapes using correct language Calculate the volume of cubes and cuboids Calculate the volume of composite 3D shapes made up of cubes and cuboids 	 volume and surface area of a right prism and cylinder Angles Constructions, loci and bearings Pythagoras and trigonometry Explore and apply Pythagoras theorem to find missing sides in a right angle triangle Apply metric conversions of area and volume to volume and surface area problems Explore naming sides of right angle triangles Derive and use the sin, cosine and tangent ratios to find missing angles and unknown sides 	 Find missing lengths given the area for a variety of 2D shapes Solve area and perimeter problems that involve converting units of measure Calculate areas in hectares and convert between hectares and meters squared 3D Shapes Calculate the surface area and volume of any prism Identify and sketch planes of symmetry in 3D shapes Interpret plans and elevation drawings Find the volume and 	 Find missing lengths given the area for a variety of 2D shapes Solve area and perimeter problems that involve converting units of measure Calculate areas in hectares and convert between hectares and meters squared 3D Shapes Calculate the surface area and volume of any prism Find the volume and surface area of cones, spheres, pyramids and composite 3D solids Work backwards to find missing 	 Use a variety of estimation techniques in context, creating working models for: populations, land to sea ratio's or in manufacturing/production planning (Core Maths) Complete proofs and solve equations using trigonometric identities (Alevel) Angles, Measures, Pythagoras and trigonometry Drawing accurate force diagrams (A-level) Work with maps, scale drawings and bearings Use Pythagoras' theorem working with lengths and distances Use angle rules with mechanical modelling, force diagrams and with calculations of vector quantities (A-level) Using exact trigonometric ratios (A-level) Use sine and cosine rules to solve geometric problems with triangles(A-level) Use double angle and compound angle 	 Graphics/Product Design 	Engineering Chemical Engineering Civil Engineering Economics Electrical/Electronic Engineering (General) Mathematics Mechanical Engineering Physics Statistics Food/Manufacturing Logistics Factory product design and production planning Architecture Sound engineer

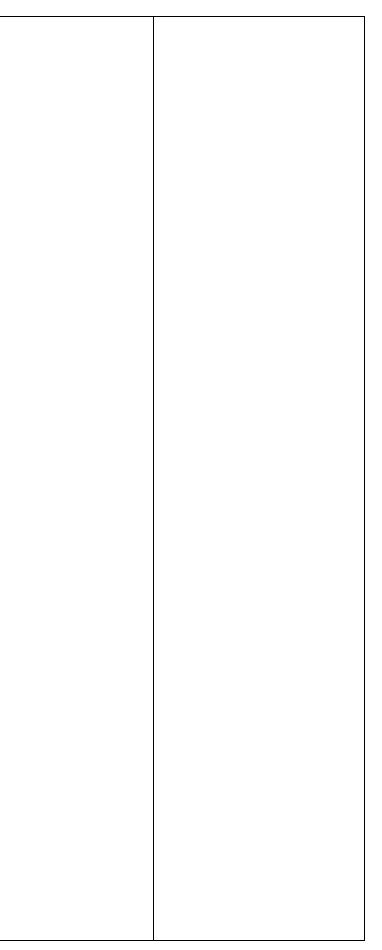
Core knowledge and skills mapped across the curriculum



vertically	Sketch the nets	Transformations,	surface area	values for the	formulae to complete
opposite and	of 3D solids	vectors and	of cones,	above	proofs and solve
around a point	accurately	congruency	spheres,	Angles	equations (A-level)
to solve	 Draw 3D solids 	Enlarge a 2D	pyramids and	AnglesDerive and	• Draw and use graphs of
problems	• Draw 3D solids on isometric	shape with a	composite 3D	apply the	Draw and use graphs of sing, agains, and tangant
. Use the rule for		centre of	solids	formula for sum	sine, cosine and tangent
Use the rule for	paper	enlargement	Angles	of interior	to find all solutions to
angles in a	 Draw plans 	Find the	AnglesDerive and	angles in any	trigonometric equations.
tringle to solve	and elevations	centre of	apply the	regular or	(A-level)
problems	of 3D solids	enlargement	formula for	irregular	Graphs of reciprocal
involving interior and		by drawing	sum of interior	polygon and	trigonometric functions
	Calculate the	lines on grid	angles in any	use this to find	and their domains and
exterior angles	surface area of		regular or	missing angles	ranges (A-level)
• Use the sum of	cubes and	 Understand 	irregular		
angles in a	cuboids	that the scale	polygon and	Explore and	Use reciprocal trigonometric functions to
quadrilateral to		factor is the	use this to find	understand	trigonometric functions to solve equations(A-level)
solve interior		ratio between	missing angles	angle proofs	solve equalions (A-level)
and exteriors		the		about triangles	Use inverse trigonometric
angle	Angles	corresponding	 Explore and 	Derive and use	functions and their
problems for	Use the	lengths	understand	the fact that	domains and ranges(A-
quadrilaterals	properties of	Enlarge 2D	angle proofs	the exterior	level)
Constructions, loci	special	shape by	about triangles	angle of a	
and bearings	quadrilaterals	using negative	Constructions, loci	triangle is	Work interchangeably with degrees and radians(A
Use a ruler and	to solve angle	integers and	and bearings	equal to the	degrees and radians(A-
protractor to	problems	fractional	Accurately	sum of the two	level)
draw triangles	 Introduction to 	scale factors	draw angles	opposite	Use radians to work out
articulately	parallel line		and 2D shapes	interior angles	areas of sectors and
	notation and	Use congruent	using a ruler,		segments(A-level)
Pythagoras and	concept	shapes to	protractor and	Derive and	Small angle
trigonometry	1 - 1	solve	compasses	apply the	approximations(A-level)
Transformations,	 Identify alternate and 	problems	• Construct of	formula for sum	
vectors and	alternate and	involving	Construct a	of interior	 Modelling with
congruency	corresponding	triangles and	polygon inside	angles in any	trigonometric functions in
 Identify 	angles on a	other	a circle	regular or	context(A-level)
congruent	diagram and use facts to	polygons	 Bisect angles 	irregular	Circles
shapes		Work out if	and lines using	polygon and	
	solve missing	shapes are	compasses	use this to find	 Identify and use parts of circles with formulas for
Describe and	angle problems in	similar,	and rulers	missing angles	area and volume.
perform	parallel lines	congruent or	Find the	Constructions, loci	
enlargements		neither	 Find the shortest 	and bearings	Apply circle theorems to
with only scale	 Calculate the 	 Solve 	distance from	 Accurately 	solve geometric problems
factor (no centre)	sum of interior	 solve problems 	a point to a	draw angles	(A-level)
Cermej	and exterior	involving	line	and 2D shapes	
Recognise lines	angles in a	similar		using a ruler,	
of symmetry	polygon	triangles		protractor and	
and rotation				compasses	
		Measures			

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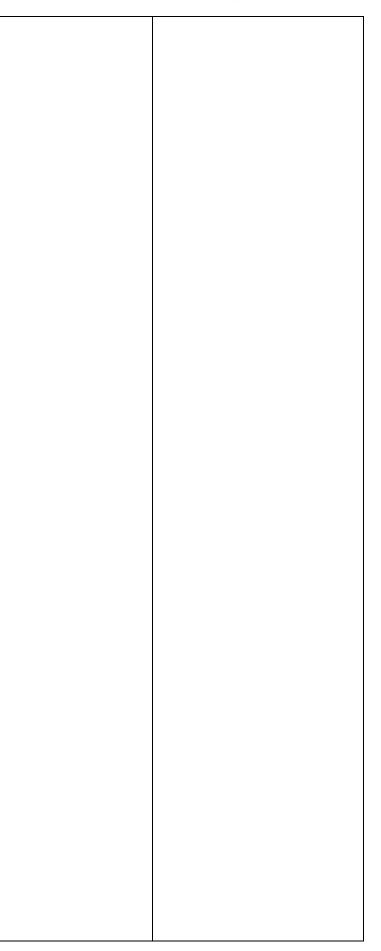




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	symmetry in 2D	 Work out the 	Calculate with	•	Draw loci and	•	Construct a	Transformations, v	vectors and
	shapes	sizes of interior	compound		identify regions		polygon inside	congruency	
•	Identify	and exterior	measures		bound by loci		a circle		
•	,	angles in a	(speed,		Find and use 2		Piscot analos		n vectors and
	refection	polygon	density and	•	Find and use 3	•	Bisect angles	unit vector	
	symmetry in 3D		pressure)		figure bearings		and lines using	interchang	geably(A-level)
	shapes	Develop		•	Use angles in		compasses		magnitude and
•	Carry out	reasoning skills	SOLVE		parallel lines to		and rulers		-
	reflections in a	including using	PROBLEMS		work out	•	Find the		of vectors (A-
	mirror line,	angle notation	USING		bearings	_	shortest	level)	
	including on a	and correct	CONSTANT		boarings		distance from	 Use vector 	s to solve
	coordinate	definitions	rates and	•	Solve problems		a point to a	aeometric	problems(A-
	grid	Form equations	RELATED		involving		line	level)	
	gila	to find missing	FORMULA		bearings and				
•	Describe a	•	Circles		scale diagrams	•	Draw loci and		s in speeds and
	reflection on a	angles	Circles				identify regions	distance c	alculations(A-
	coordinate	Constructions, loci	Explore parts	-	agoras and		bound by loci	level)	
	grid	and bearings	of a circle and		nometry		,		rin 2D(Aloval)
	-	-	define key	•	Calculate the	•	Find and use 3		s in 3D(A-level)
•	Describe and	Pythagoras and	parts		length of a line		figure bearings	 Use vector 	s in mechanics
	perform	trigonometry	Derive and		segment using	•	Use angles in	(A-level)	
	rotations on a		use formulae		Pythagoras	-	parallel lines to		
	coordinate	Transformations,	for area and	•	Know and use		work out		nks between
	grid	vectors and	circumference		exact		bearings	-	tric graphs using
•	Perform and	congruency	of a circle and		trigonometric		Dealings	transforma	ition(A-level)
•	describe		calculate		values	•	Solve problems	Draw and	describe affects
	translations	Measures	leaving your		Values		involving		on, reflections
		Converting	answer in	•	Combine		bearings and		nes to graphs
	using	units of	terms of pi		Pythagoras		scale diagrams		equations(A-
	instruction, not	measures for			and			level)	
	vectors	area, volume			trigonometry		agoras and		
•	Perform a	and capacity			to complex	frigoi	nometry	Combining	g multiple
	combination of	 Know rough 			problems	•	Find angles of	dependen	it and
	transformations	equivalences		-	r		elevation and	independe	ent
	on 2D shapes	between			formations,		depression	•	ition(A-level)
		metric and			ors and	•	Recall and use		. ,
Measu		imperial units		-	ruency Translate		exact trig		
•	Compare			•			values		
	measurements	Circles			shape on coordinate				
	by converting					•	Calculate the		
	them to the				grid suing a		length of a line		
	same units				column vector		segment using		
	(metric)			•	Describe		Pythagoras		
	Solvo simplo				combination		Combine		
•	Solve simple				of	•	Combine		
	problems				transformations		Pythagoras		
	involving units						and		
	of			•	Identify and		trigonometry to		
	measurements				use the four				

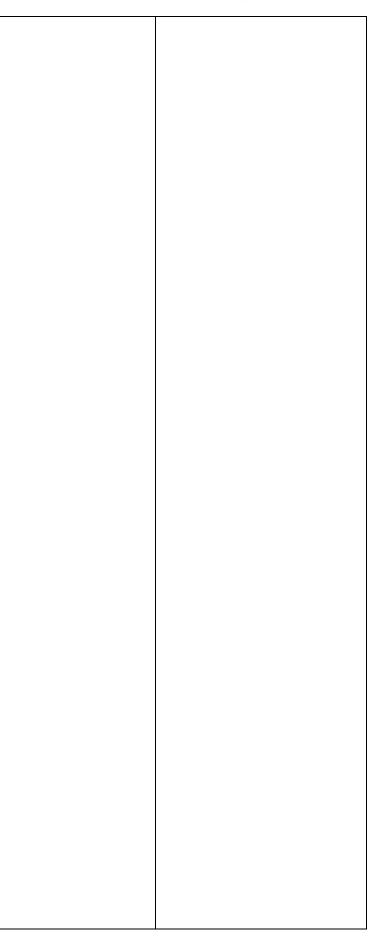
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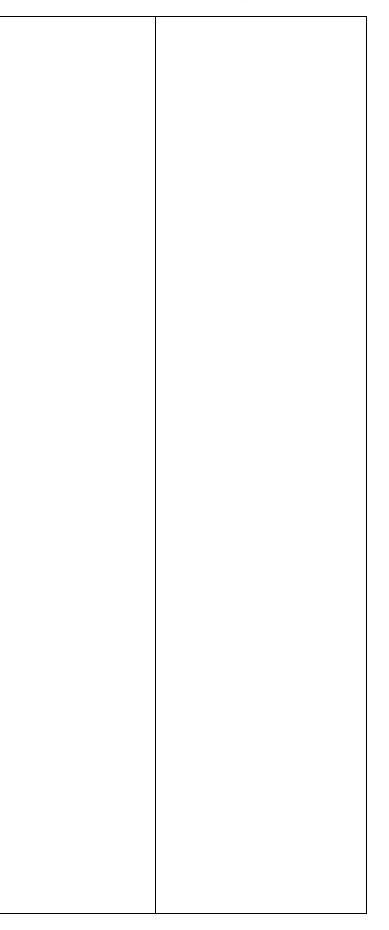
 in the context of length, mass and capacity Convert between metric units of length, mass and capacity Use scale diagrams Read scales on measuring equipment Choose suitable units to estimate length and areas Use metric and imperial units 	 triangle congrue rules from given descripti Understo similarity use it to angle problem Use simila solve an problem find miss lengths Determin when tw shapes of definitely (or may be) simila Calculat perimete similar sh Use congrue work out unknown angles a sides Perform column arithmet Identify column vectors t are parc Perform column vectors t are parc 	m a • Know and use the graphs of sine/cosine and and tangent and and tangent and and tangent and • Know how to use both a calculator and the graph to arity to gigle • Know how to use both a calculator and the graph to any angle ing • Derive and use the formula for area of triangle using sine are • Use the above formula to calculate the area of a segment of a carea of a carea of a circle are • Derive and use the sine and carea of a circle berive • Derive and use the sine and angles ency to the • Derive and use the sine and angles ency to thand • Solve bearings problems using all trigonometry in allel • Recognise how vector ic and tic and tic and the • Recognise how changes in functions effect tift





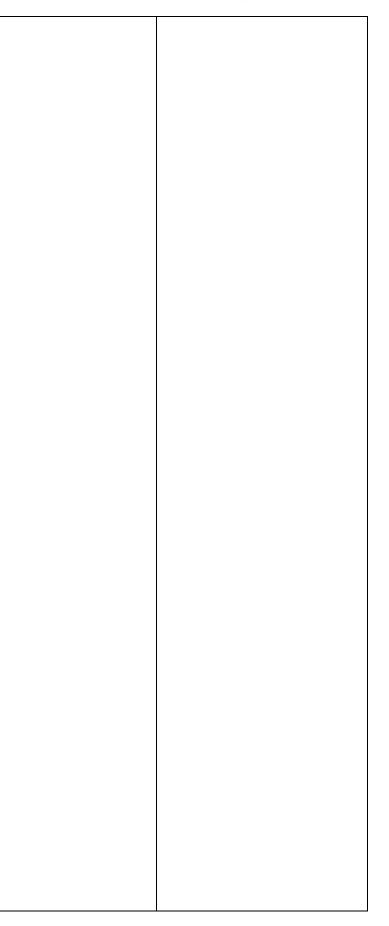
	Measures • Draw diagrams to scale Circles • Work out the radius or diameter of a circle given the circumference or area of a circle • Calculate areas and perimeter of sectors of circles	 Transformations, vectors and congruency Translate shape on coordinate grid suing a column vector Describe combination of transformations Describe an enlargement with a negative scale factor Identify and use the four triangle congruency rules from a given description Understand similarity and use it to solve angle problems Use similarity to solve angle problems Use similarity to solve angle problems Determine when two shapes are definitely not (or may not be) similar Calculate perimeters of similar shapes 		
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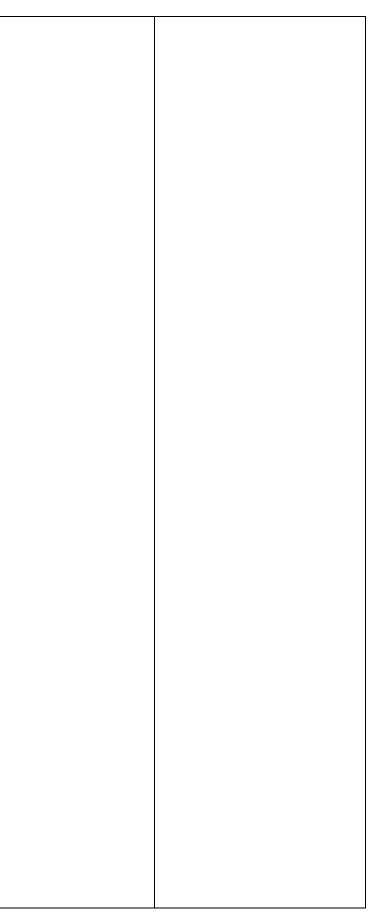
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	Use congruency to work out unknown angles and sides
	Perform column vector arithmetic
	Identify column vectors that are parallel
	Draw vectors
	Prove shapes are congruent
	 Find similar length, areas and volumes
	Understand and use vector notation
	Work out the magnitude of a vector
	 Perform vector arithmetic and represent the solutions graphically
	 Identify when vectors are parallel and find the resultant of two vectors
	Use the resultant of two vectors to solve vector problems





 Express points as position vectors Prove that lines are parallel or points are colinear
Solve geometric problems involving vectors and given ratios
Measures Draw diagrams to scale
Calculate rates Convert between metric units of speed
Use a formula to calculate speed and acceleration
Circles • Work out the radius or diameter of a circle given the circumference or area of a circle
Calculate areas and perimeter of sectors of circles
Calculate areas and perimeter of





		sectors of circles	



