Nrich K-6 curriculum mapping document

Mapping to the curriculum - Measurement and Geometry

Many Australian teachers access the problems, games and investigations from the website www.nrich.maths.org to use with their students either as launch activities or as longer investigations during mathematics lessons. This resource maps the Nrich tasks to the NSW mathematics K-6 syllabus outcomes and descriptors for Measurement and Geometry. The Nrich primary site provides links to other countries' curriculum documents (e.g. England's curriculum) and these have been a guide for the production of this resource. In this resource, the tasks have been linked to the NSW syllabus *content* outcomes only. All of these tasks potentially link to the working mathematically outcomes of communicating, problem solving and reasoning (based on the four proficiencies from the Australian Curriculum) however, it is more how the individual teacher utilises the tasks that determine their link to working mathematically.
This resource maps task to the Measurement and Geometry strand, two other resources have been developed that link to Number and Algebra and Statistics and Probability. The links here are not an exhaustive list of the many ways the tasks can be utilised or connected to concepts across the curriculum. The tasks have been linked to the content descriptor they mainly focus on, other connections can be made to other areas as well. As more tasks are added to the Nrich site this document will be updated.
Nrich also have a Primary Live Problems site where schools and their students can access problems and then send their solutions to Nrich who will publish a section of them.

References

Board of Studies NSW. (2012) Mathematics K-10 syllabus. Retrieved from https://syllabus.nesa.nsw.edu.au/download
Nrich website www.nrich.maths.org all tasks © University of Cambridge

Length			
Early Stage 1 MAe-9MG	**Stage 1 MA1-9MG**	**Stage 2 MA2-9MG**	**Stage 3 MA3-9MG**
Use direct and indirect comparisons to decide which is longer, and explain their reasoning using everyday language (ACMMG006) Making caterpillars Long creatures Sock washing line Mud kitchen	Measure and compare the lengths of pairs of objects using uniform informal units (ACMMG019) Making caterpillars Long creatures Sock washing line Sizing them up Can you do it too? Building towers	Measure, order and compare objects using familiar metric units of length (ACMMG061) Discuss and choose Little man How tall? Order, order! Olympic starters Car journey	Choose appropriate units of measurement for length (ACMMG108) How tall?
	Compare and order several shapes and objects based on length, using appropriate uniform informal units (ACMMG037) Making caterpillars Long creatures Sock washing line Mud kitchen Sizing them up The animals' sports day Order, order! Making longer, making shorter	Use scaled instruments to measure and compare lengths (ACMMG084) How tall? Order, order! Car journey	Calculate the perimeters of rectangles using familiar metric units (ACMMG109) Area and perimeter

Length			
Early Stage 1 MAe-9MG	**Stage 1 MA1-9MG**	**Stage 2 MA2-9MG**	**Stage 3 MA3-9MG**
	Recognise and use formal units to measure the lengths of objects How tall? Order, order! Car journey	Use scaled instruments to measure and compare temperatures (ACMMG084)	Connect decimal representations to the metric system (ACMMG135)
			Convert between common metric units of length (ACMMG136)
			Solve problems involving the comparison of lengths using appropriate units (ACMMG137) Area and perimeter Numerically equal Dicey perimeter, dicey area

Area			
Early Stage 1 MAe-10MG	**Stage 1 MA1-10MG**	**Stage 2 MA2-10MG**	**Stage 3 MA3-10MG**
Use direct comparison to decide which shape has a larger area and explain their reasoning using everyday language Sock washing line	Measure and compare areas using uniform informal units Wrapping parcels Sock washing line Sizing them up Wallpaper	Recognise and use formal units to measure and estimate the areas of rectangles Area and perimeter Numerically equal Dicey perimeter, dicey area	Choose appropriate units of measurement for area (ACMMG108) Area and perimeter Though the window (note: change to dollar sign for Australian context) Numerically equal Fitted Dicey perimeter, dicey area
	Compare and order several shapes and objects based on area using appropriate uniform informal units (ACMMG037) Wrapping parcels Sock washing line Sizing them up Different sizes Wallpaper	Compare the areas of regular and irregular shapes by informal means (ACMMG087) Different sizes Wallpaper Fitted	Calculate the areas of rectangles using familiar metric units (ACMMG109) Area and perimeter Though the window (note: change to dollar sign for Australian context) Numerically equal Fitted Dicey perimeter, dicey area

Area			
Early Stage 1 MAe-10MG	**Stage 1 MA1-10MG**	**Stage 2 MA2-10MG**	**Stage 3 MA3-10MG**
		Compare objects using familiar metric units of area (ACMMG290) Area and perimeter Though the window (note: change to dollar sign for Australian context) Numerically equal Fitted Dicey perimeter, dicey area	Solve problems involving the comparison of areas using appropriate units (ACMMG137) Area and perimeter Though the window (note: change to dollar sign for Australian context) Brush loads Numerically equal Ribbon squares Fitted Dicey perimeter, dicey area

Volume and capacity			
Early Stage 1 MAe-11MG	**Stage 1 MA1-11MG**	**Stage 2 MA2-11MG**	**Stage 3 MA3-11MG**
Use direct and indirect comparisons to decide which holds more, and explain their reasoning using everyday language (ACMMG006) I have a box Mud kitchen Water, water	Measure and compare the capacities of pairs of objects using uniform informal units (ACMMG019) Cooking Water, water	Measure, order and compare objects using familiar metric units of capacity (ACMMG061) Cooking Bottles 1 Bottles 2 Discuss and choose Compare the cups Oh! Harry! Pouring problem	Choose appropriate units of measurement for volume and capacity (ACMMG108) Pouring problem
	Compare and order several objects based on volume and capacity using appropriate uniform informal units (ACMMG037) Cooking I have a box Mud kitchen Water, water Bottles 1 Bottles 2 Thirsty? Compare the cups Packing	Compare objects using familiar metric units of volume (ACMMG290) Bottles 1 Bottles 2 Discuss and choose Little man Compare the cups	Connect volume and capacity and their units of measurement (ACMMG138) Oh! Harry! Next size up

Volume and capacity			
Early Stage 1 MAe-11MG	**Stage 1 MA1-11MG**	**Stage 2 MA2-11MG**	**Stage 3 MA3-11MG**
		Use scaled instruments to measure and compare capacities (ACMMG084) Bottles 2 Compare the cups Oh! Harry!	Connect decimal representations to the metric system (ACMMG135)
			Convert between common metric units of capacity (ACMMG136)
			Calculate the volumes of rectangular prisms (ACMMG160) Making boxes Next size up Multilink cubes

Mass			
Early Stage 1 MAe-12MG	**Stage 1 MA1-12MG**	**Stage 2 MA2-12MG**	**Stage 3 MA3-12MG**
Use direct and indirect comparisons to decide which is heavier, and explain their reasoning using everyday language (ACMMG006) Wrapping parcels Balances Presents Spring scale I have a box Mud kitchen	Investigate mass using a pan balance Wrapping parcels Balances Presents Spring scale Weighted numbers	Measure, order and compare objects using familiar metric units of mass (ACMMG061) Wrapping parcels Discuss and choose Order, order! Weighted numbers	Choose appropriate units of measurement for mass (ACMMG108)
	Compare the masses of objects using balance scales (ACMMG038) Wrapping parcels Balances Cooking Presents Spring scale Weighted numbers	Use scaled instruments to measure and compare masses (ACMMG084) Wrapping parcels Order, order! Weighted numbers	Connect decimal representations to the metric system (ACMMG135)
			Convert between common metric units of mass (ACMMG136)

Time			
Early Stage 1 MAe-13MG	**Stage 1 MA1-13MG**	**Stage 2 MA2-13MG**	**Stage 3 MA3-13MG**
Compare and order the duration of events using the everyday language of time (ACMMG007) Calendar muddle Timing Times of day	Name and order months and seasons (ACMMG040) Calendar muddle	Tell time to the minute and investigate the relationship between units of time (ACMMG062) Order, order! What is the time? Clocks Two clocks The time is … Approaching midnight Wonky watches Watch the clock Times Clock hands	Compare 12- and 24-hour time systems and convert between them (ACMMG110) The time is … 5 on the clock Approaching midnight
Connect days of the week to familiar events and actions (ACMMG008) Calendar muddle Snap	Use a calendar to identify the date and determine the number of days in each month (ACMMG041) Calendar muddle	Convert between units of time (ACMMG085) Order, order! Olympic starters Two clocks Approaching midnight Wonky watches	Determine and compare the duration of events Discuss and choose Olympic starters

Time			
Early Stage 1 MAe-13MG	**Stage 1 MA1-13MG**	**Stage 2 MA2-13MG**	**Stage 3 MA3-13MG**
Tell time on the hour on analog and digital clocks	Tell time to the half-hour (ACMMG020) What is the time? Stop the clock Matching time Clocks Two clocks	Use am and pm notation and solve simple time problems (ACMMG086) Matching time Approaching midnight Wonky watches Watch the clock Clock hands	Interpret and use timetables (ACMMG139)
	Describe duration using months, weeks, days and hours (ACMMG021) Calendar muddle Timing Times of day The games' medals Snap Matching time	Read and interpret simple timetables, timelines and calendars It figures	Draw and interpret timelines using a given scale
	Tell time to the quarter-hour using the language of 'past' and 'to' (ACMMG039) What is the time? Matching time Clocks Two clocks		

Three-dimensional space			
Early Stage 1 MAe-14MG	**Stage 1 MA1-14MG**	**Stage 2 MA2-14MG**	**Stage 3 MA3-14MG**
Sort, describe and name familiar three-dimensional objects in the environment (ACMMG009) Presents Mud kitchen Building towers Packing Tubes and tunnels	Recognise and classify familiar three-dimensional objects using obvious features (ACMMG022) Presents Mud kitchen Building towers Building with solid shapes Sorting logic blocks	Make models of three-dimensional objects and describe key features (ACMMG063) Building towers Packing Tubes and tunnels Rolling that cube Skeleton shapes Cubes Cubes cut into four pieces Triple cubes Building blocks Arranging cubes Construct-o-straws Making cuboids	Compare, describe and name prisms and pyramids Skeleton shapes A puzzling cube Sponge sections Sorting logic blocks

Three-dimensional space			
Early Stage 1 MAe-14MG	**Stage 1 MA1-14MG**	**Stage 2 MA2-14MG**	**Stage 3 MA3-14MG**
	Describe the features of three-dimensional objects (ACMMG043) Presents Packing Tubes and tunnels Always, sometimes or Never? KS1 Building with solid shapes Shadow play Sorting logic blocks	Investigate and represent three-dimensional objects using drawings Rolling that cube Skeleton shapes Cubes Shadow play Cubes cut into four pieces Triple cubes A puzzling cube Arranging cubes The third dimension Inky cube Multilink cubes Little boxes Cereal packets Making cuboids	Connect three-dimensional objects with their nets and other two-dimensional representations (ACMMG111) Rolling that cube Skeleton shapes Shadow play Cubes cut into four pieces Triple cubes Making boxes Building blocks A puzzling cube Arranging cubes Sponge sections The third dimension Inky cube Multilink cubes Construct-o-straws Little boxes Cereal packets Cut nets

Three-dimensional space			
Early Stage 1 MAe-14MG	**Stage 1 MA1-14MG**	**Stage 2 MA2-14MG**	**Stage 3 MA3-14MG**
			Construct simple prisms and pyramids (ACMMG140) Skeleton shapes Cubes Triple cubes Building blocks Arranging cubes Sponge sections Multilink cubes Construct-o-straws Making cuboids

Two-dimensional space			
Early Stage 1 MAe-15MG	**Stage 1 MA1-15MG**	**Stage 2 MA2-15MG**	**Stage 3 MA3-15MG**
Sort, describe and name familiar two-dimensional shapes in the environment (ACMMG009) Collecting Exploring 2D shapes Making footprints Shapes in a bag Matching triangles Data shapes Paper partners	Recognise and classify familiar two-dimensional shapes using obvious features (ACMMG022) Exploring 2D shapes Making a picture Shapes in a bag Jig shapes Poly plug rectangles Seeing squares Chain of changes Triangle or no triangle? Matching triangles Data shapes	Compare and describe features of two-dimensional shapes, including the special quadrilaterals Shapes in a bag Shaping it What's happening? Jig shapes Overlaps Shapely lines Poly plug rectangles Let's investigate triangles Seeing squares Paper patchwork 1	Classify two-dimensional shapes and describe their features Always, sometimes or Never? KS1 Overlaps Paper patchwork 1 Paper patchwork 2 Triangle or no triangle? Square corners Overlapping again Move those halves Board block challenge What shape? Nine-pin triangles

Two-dimensional space			
Early Stage 1 MAe-15MG	**Stage 1 MA1-15MG**	**Stage 2 MA2-15MG**	**Stage 3 MA3-15MG**
Sort, describe and name familiar two-dimensional shapes in the environment (ACMMG009) Collecting Exploring 2D shapes Making footprints Shapes in a bag Matching triangles Data shapes Paper partners	Recognise and classify familiar two-dimensional shapes using obvious features (ACMMG022) Exploring 2D shapes Making a picture Shapes in a bag Jig shapes Poly plug rectangles Seeing squares Chain of changes Triangle or no triangle? Matching triangles Data shapes Paper partners Three fingers and a loop of string What shape? Geoboards Where are they? Egyptian rope	Compare and describe features of two-dimensional shapes, including the special quadrilaterals Shapes in a bag Shaping it What's happening? Jig shapes Overlaps Shapely lines Poly plug rectangles Let's investigate triangles Seeing squares Paper patchwork 1 Paper patchwork 2 Chain of changes Triangle or no triangle? Stick images Square corners Overlapping again Move those halves Board block Seven sticks Three fingers and a loop of string Board block challenge What shape? Shapes on the playground Penta places Tetrafit Geoboards Polydrons	Classify two-dimensional shapes and describe their features Always, sometimes or Never? KS1 Overlaps Paper patchwork 1 Paper patchwork 2 Triangle or no triangle? Square corners Overlapping again Move those halves Board block challenge What shape? Nine-pin triangles Tri.'s Tessellating triangles Cut it out Quad match Is a square a rectangle? Making rectangles Where are they? Always, sometimes or never? Shape Triangles all around Name that triangle

Two-dimensional space			
Early Stage 1 MAe-15MG	**Stage 1 MA1-15MG**	**Stage 2 MA2-15MG**	**Stage 3 MA3-15MG**
		Compare and describe features of two-dimensional shapes, including the special quadrilaterals (continued …) Quad match Is a square a rectangle? Penta play Making rectangles Where are they? Always, sometimes or never? Shape Quadrilaterals Egyptian rope	

Two-dimensional space			
Early Stage 1 MAe-15MG	**Stage 1 MA1-15MG**	**Stage 2 MA2-15MG**	**Stage 3 MA3-15MG**
	Describe and draw two-dimensional shapes, with and without the use of digital technologies (ACMMG042) Making footprints Making a picture Shaping it What's happening? Always, sometimes or Never? KS1 Shapely lines Let's investigate triangles Seeing squares Paper patchwork 1 Paper patchwork 2 Chain of changes Complete the square Inside triangles Board block Seven sticks Three fingers and a loop of string Board block challenge What shape? Shapes on the playground Penta places Tetrafit Geoboards Polydrons Shape draw Penta play Where are they?	Identify symmetry in the environment (ACMMG066) Shaping it National flags	Describe translations, reflections and rotations of two-dimensional shapes (ACMMG114) Overlaps Three squares Exploding squares Square corners Overlapping again Move those halves Inky cube Nine-pin triangles Tri.'s Penta places Tetrafit Polydrons Bracelets Cut it out Baravelle Let us reflect Penta play Logo challenge 1 - Star square Triangles all around Reflector! Rotcelfer Egyptian rope Transformations on a pegboard

Two-dimensional space			
Early Stage 1 MAe-15MG	**Stage 1 MA1-15MG**	**Stage 2 MA2-15MG**	**Stage 3 MA3-15MG**
	Investigate the effect of one-step slides and flips, with and without the use of digital technologies (ACMMG045) Shaping it Jig shapes Overlaps Three squares Exploding squares Chain of changes Matching triangles Turning Olympic Rings Turning man Cover the camel Overlapping again Move those halves Tessellating triangles Penta places Tetrafit Polydrons Cut and make Tangram paradox Let us reflect Penta play	Compare and describe two-dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies (ACMMG088) What's happening? Overlaps Three squares Paper patchwork 1 Paper patchwork 2 Tangram tangle A city of towers Triangle animals Torn shapes Stick images Overlapping again Move those halves Penta places Tetrafit Polydrons Four triangles puzzle Cut and make Square to L Tangram paradox Penta play Making rectangles	Identify line and rotational symmetries (ACMMG114) Exploding squares Colouring triangles Matching triangles Inky cube Baravelle Stringy quads National flags Symmetry challenge

Two-dimensional space			
Early Stage 1 MAe-15MG	**Stage 1 MA1-15MG**	**Stage 2 MA2-15MG**	**Stage 3 MA3-15MG**
	Identify and describe half-turns and quarter-turns (ACMMG046) Shaping it Jig shapes Overlaps Matching triangles Turning Turning man Cover the camel Overlapping again Move those halves Tessellating triangles Penta places Tetrafit Polydrons Penta play	Create symmetrical patterns, pictures and shapes, with and without the use of digital technologies (ACMMG091) Shaping it Exploding squares Colouring triangles Poly plug pattern Repeating pattern Circles, circles School fair necklaces Stick images Seven sticks Jumping reindeer Tessellating triangles Penta places Two by one Tetrafit Polydrons Bracelets Cut and make Let us reflect Penta play Symmetry challenge	Apply the enlargement transformation to familiar two-dimensional shapes and explore the properties of the resulting image compared with the original (ACMMG115) Twice as big
			Investigate the diagonals of two-dimensional shapes Jumping reindeer Diagonal chase

Two-dimensional space			
Early Stage 1 MAe-15MG	**Stage 1 MA1-15MG**	**Stage 2 MA2-15MG**	**Stage 3 MA3-15MG**
			Identify and name parts of circles Making spirals
			Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies (ACMMG142) Overlaps Three squares Tangram tangle Cover the camel Square corners Overlapping again Move those halves Inky cube Tessellating triangles Let us reflect Triangles all around Transformations on a pegboard

Angles			
		Stage 2 MA2-16MG	**Stage 3 MA3-16MG**
		Identify angles as measures of turn and compare angle sizes in everyday situations (ACMMG064) Walking round a triangle Six places to visit Olympic turns Round a hexagon	Estimate, measure and compare angles using degrees (ACMMG112) The numbers give the design Estimating angles Logo challenge 1 - Star square How safe are you? Round a hexagon National flags
		Compare angles and classify them as equal to, greater than or less than a right angle (ACMMG089) Caterpillars Take the right angle Olympic turns National flags	Construct angles using a protractor (ACMMG112) Olympic turns
			Investigate, with and without the use of digital technologies, angles on a straight line, angles at a point, and vertically opposite angles; use the results to find unknown angles (ACMMG141) The numbers give the design Estimating angles

Position			
Early Stage 1 MAe-16MG	**Stage 1 MA1-16MG**	**Stage 2 MA2-17MG**	**Stage 3 MA3-17MG**
Describe position and movement (ACMMG010) Mud kitchen Paths Position with Wellies (note: may need to call them boots or gumboots) Small world play Two rings Olympic Rings Six places to visit	Give and follow directions to familiar locations (ACMMG023) Paths Position with Wellies (note: may need to call them boots or gumboots) Scooters, bikes and trikes Small world play Six places to visit	Create and interpret simple grid maps to show position and pathways (ACMMG065) Six places to visit	Use a grid-reference system to describe locations (ACMMG113) Transformation tease
	Interpret simple maps of familiar locations and identify the relative positions of key features (ACMMG044)	Use simple scales, legends and directions to interpret information contained in basic maps (ACMMG090)	Describe routes using landmarks and directional language (ACMMG113) Six places to visit