Nrich K-6 curriculum mapping document

Mapping to the curriculum - Number and Algebra

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 (including ACARA's Australian Curriculum codes) for Number and Algebra.
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 Number and Algebra strand, two other resources have been developed that link to Measurement and Geometry 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

Whole Numbers			
Early Stage 1 MAe-4NA	**Stage 1 MA1-4NA**	**Stage 2 MA2-4NA**	**Stage 3 MA3-4NA**
Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point (ACMNA001) The estimation station Using books: Maisie goes camping Number book Owl's packing list Tidying	Develop confidence with number sequences to 100 by ones from any starting point (ACMNA012) Buzzy bee Dotty Six 100 square jigsaw That number square	Recognise, model, represent and order numbers to at least 10 000 (ACMNA052) How would we count? Coded hundred square Which scripts? Nice or nasty Four-digit targets Ordering journeys Representing numbers Which is quicker?	Recognise, represent and order numbers to at least tens of millions Nice or nasty Four-digit targets Number lines in disguise Ordering journeys
Connect number names, numerals and quantities, including zero, initially up to 10 and then beyond (ACMNA002) Number talks The estimation station Golden beans Number rhymes Dice The box game	Count collections to 100 by partitioning numbers using place value (ACMNA014) Snail one hundred Six beads How would we count? Count the crayons	Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems (ACMNA053) Coded hundred square Which scripts? Space distances Round the four dice	Identify and describe factors and multiples of whole numbers and use them to solve problems (ACMNA098) The deca tree Four-digit targets Satisfying four statements Flashing lights Abundant numbers Factors and multiples game Three dice Factor track What do you need? Factor lines Factor-multiple chains Counting cogs

Whole Numbers			
Early Stage 1 MAe-4NA	**Stage 1 MA1-4NA**	**Stage 2 MA2-4NA**	**Stage 3 MA3-4NA**
Subitise small collections of objects (ACMNA003) Number talks Hidden jewels Show me	Recognise, model, read, write and order numbers to at least 100; locate these numbers on a number line (ACMNA013) Writing digits Shut the box Snail one hundred Six beads How would we count? Tug of war The eightness of eight Count the digits Two spinners Number match	Recognise, represent and order numbers to at least tens of thousands (ACMNA072) Which distance? Space distances Nice or nasty Four-digit targets Ordering journeys Which is quicker?	Investigate everyday situations that use integers; locate and represent these numbers on a number line (ACMNA124) Tug harder! Swimming pool Sea level First connect three
Compare, order and make correspondences between collections, initially to 20, and explain reasoning (ACMNA289) The voting station Show me Dice Number match	Recognise, describe and order Australian coins according to their value (ACMNA017)		Identify and describe properties of prime, composite, square and triangular numbers (ACMNA122) Square subtraction Satisfying four statements Two primes make one square Up and down staircases One wasn't square Cycling squares Picture a pyramid … Always, sometimes or never? Number Odd squares Cubes within cubes

Whole Numbers			
Early Stage 1 MAe-4NA	**Stage 1 MA1-4NA**	**Stage 2 MA2-4NA**	**Stage 3 MA3-4NA**
Use the language of money Shopping - Pirate Poundland (note: use of UK pounds, will need to adapt to cents)	Recognise, model, represent and order numbers to at least 1000 (ACMNA027) Count the crayons		
	Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and tens from any starting point, then moving to other sequences (ACMNA026) Five steps to 50 Biscuit decorations Same length trains		
	Group, partition and rearrange collections of up to 1000 in hundreds, tens and ones to facilitate more efficient counting (ACMNA028) Snail one hundred Two-digit targets Six beads Count the crayons Two spinners Which is quicker?		

Whole Numbers			
Early Stage 1 MAe-4NA	**Stage 1 MA1-4NA**	**Stage 2 MA2-4NA**	**Stage 3 MA3-4NA**
	Count and order small collections of Australian coins and notes according to their value (ACMNA034) Shopping - Pirate Poundland (note: need to adapt to cents)		

Addition and Subtraction			
Early Stage 1 MAe-5NA	**Stage 1 MA1-5NA**	**Stage 2 MA2-5NA**	**Stage 3 MA3-5NA**
Represent practical situations to model addition and sharing (ACMNA004) Using books: Maisie goes camping Double trouble Maths story time Playing Incey Wincey spider	Represent and solve simple addition and subtraction problems using a range of strategies, including counting on, partitioning and rearranging parts (ACMNA015) Shut the box Two dice Same length trains Snail one hundred Noah Robot monsters All change Largest even Eggs in baskets Cuisenaire counting Pairs of numbers Weighted numbers Ladybirds in the garden Unit differences Sealed solution Roll these dice Finding fifteen Six numbered cubes	Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation (ACMNA055) Number lines Butterfly facts Strike it out Number round up 4 Dom Jumping squares Sometimes, always, never? KS1 Double or halve Two numbers under the microscope Number detectives Our numbers Number lines in disguise A mixed-up clock Magic V Fifteen cards Amy's dominoes Sealed solution	Use efficient mental and written strategies and apply appropriate digital technologies to solve problems (ACMNA291) Tug harder! Swimming pool Sea level First connect three Dicey operations Dicey operations in line Round the four dice Number lines in disguise Fifteen cards Domino square Got it

Addition and Subtraction			
Early Stage 1 MAe-5NA	**Stage 1 MA1-5NA**	**Stage 2 MA2-5NA**	**Stage 3 MA3-5NA**
		Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation (ACMNA055) continued … Roll these dice Play to 37 Finding fifteen Domino square Make 37 Dice in a corner Maze 100 Six ten total Six numbered cubes	
	Explore the connection between addition and subtraction (ACMNA029) Tug of war How do you see it? 2, 4, 6, 8 Getting the balance right Number balance Number lines Strike it out Sort them out (1) Find the difference The add and take-away path How many? Secret number	Recognise and explain the connection between addition and subtraction (ACMNA054) Strike it out Sort them out (1) Find the difference The add and take-away path How many? Which distance? Number lines in disguise Build it up Number balance	Use estimation and rounding to check the reasonableness of answers to calculations (ACMNA099) Round the four dice Reasoned rounding

Addition and Subtraction			
Early Stage 1 MAe-5NA	**Stage 1 MA1-5NA**	**Stage 2 MA2-5NA**	**Stage 3 MA3-5NA**
	Solve simple addition and subtraction problems using a range of efficient mental and written strategies (ACMNA030) I'm eight Two-digit targets Tug of war Robot monsters Dotty Six Making sticks Round the two dice How do you see it? What could it be? 2, 4, 6, 8 Heads and feet One big triangle Strike it out Number round up Dicey addition Dice in a corner Maze 100 Six numbered cubes	Represent money values in multiple ways and count the change required for simple transactions to the nearest five cents (ACMNA059) How do you see it? Planning a school trip Money bags (note: use of UK pence, will need to adapt to Australian cents) Buying a balloon Plenty of pens (note: use of UK pounds/pence, will need to adapt to Australian cents) Price match (note: use of UK pounds/pence, will need to adapt to Australian cents)	Create simple financial plans (ACMNA106) Planning a school trip

Addition and Subtraction			
Early Stage 1 MAe-5NA	**Stage 1 MA1-5NA**	**Stage 2 MA2-5NA**	**Stage 3 MA3-5NA**
		Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems (ACMNA073) Coded hundred square Which scripts? Which distance? Space distances Tug harder! Dicey operations Dicey operations in line Round the four dice Got it Make 37 Twenty divided into six Reach 100 Subtraction surprise	Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving addition and subtraction with whole numbers (ACMNA123) Tug harder! First connect three Dicey operations Dicey operations in line Round the four dice Amy's dominoes Build it up Dice in a corner Twenty divided into six Reach 100 Subtraction surprise How do you do it?

Multiplication and Division			
Early Stage 1 MAe-6NA	**Stage 1 MA1-6NA**	**Stage 2 MA2-6NA**	**Stage 3 MA3-6NA**
Investigate and model equal groups	Skip count by twos, fives and tens starting from zero (ACMNA012) Five steps to 50 Noah Making sticks I like… Heads and feet Lots of biscuits! Clapping times	Recall multiplication facts of two, three, five and ten and related division facts (ACMNA056) Double or halve Odd times even Count me in The deca tree Representing numbers Multiples grid Times table shifts Table patterns go wild! Multiplication squares Round and round the circle	Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental and written strategies and appropriate digital technologies (ACMNA100) Dicey operations The deca tree Four-digit targets Dicey operations in line A square of numbers All the digits Trebling Curious number Four go Highest and lowest Make 100

Multiplication and Division			
Early Stage 1 MAe-6NA	**Stage 1 MA1-6NA**	**Stage 2 MA2-6NA**	**Stage 3 MA3-6NA**
Record grouping and sharing using informal methods Using books: The doorbell rang Maths story time	Model and use equal groups of objects as a strategy for multiplication I'm eight Sitting round the party tables Heads and feet Lots of biscuits! Doubling fives Catrina's cards Sweets in a box	Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies (ACMNA057) Doing and undoing Secret number Number detectives Our numbers Dicey operations The deca tree Four-digit targets Sitting round the party tables Six ten total Sweets in a box	Solve problems involving division by a one-digit number, including those that result in a remainder (ACMNA101) Dicey operations Dicey operations in line Remainders Remainders game Division rules
	Recognise and represent division as grouping into equal sets (ACMNA032) Sitting round the party tables Lots of biscuits! Share bears Birthday sharing Let us divide!	Recall multiplication facts up to 10 × 10 and related division facts (ACMNA075) I'm eight Double or halve Odd times even Count me in Multiplication square jigsaw Multiples grid Times table shifts Table patterns go wild! Multiplication squares Round and round the circle	Use estimation and rounding to check the reasonableness of answers to calculations (ACMNA099) Round the four dice

Multiplication and Division			
Early Stage 1 MAe-6NA	**Stage 1 MA1-6NA**	**Stage 2 MA2-6NA**	**Stage 3 MA3-6NA**
	Recognise and represent multiplication as repeated addition, groups and arrays (ACMNA031) Same length trains Grouping goodies Making sticks Heads and feet The Brown family Doubling fives Catrina's cards Sweets in a box	Develop efficient mental and written strategies, and use appropriate digital technologies, for multiplication and for division where there is no remainder (ACMNA076) Double or halve Our numbers Lots of lollies Dicey operations Four-digit targets A mixed-up clock Twenty divided into six Six ten total Multiplication square jigsaw Shape times shape Let us divide! Carrying cards Zios and Zepts What do you need? Mystery matrix Make 100	Select and apply efficient mental and written strategies, and appropriate digital technologies, to solve problems involving multiplication and division with whole numbers (ACMNA123) Dicey operations Four-digit targets Dicey operations in line Twenty divided into six Remainders game A square of numbers How do you do it? This Pied Piper of Hamlin All the digits Trebling Mystery matrix Division rules Highest and lowest Make 100 Four goodness sake Orange drink Pumpkin pie problem Finding 3D stacks

Multiplication and Division			
Early Stage 1 MAe-6NA	**Stage 1 MA1-6NA**	**Stage 2 MA2-6NA**	**Stage 3 MA3-6NA**
	Represent division as grouping into equal sets **and solve simple problems using these representations** (ACMNA032) Sitting round the party tables Share bears Birthday sharing Let us divide! Remainders Sweets in a box	Use mental strategies and informal recording methods for division with remainders Grouping goodies Lots of lollies Growing garlic Dicey operations Remainders Remainders game	Explore the use of brackets and the order of operations to write number sentences (ACMNA134)

Fractions and Decimals			
Early Stage 1 MAe-7NA	**Stage 1 MA1-7NA**	**Stage 2 MA2-7NA**	**Stage 3 MA3-7NA**
Establish the concept of one-half Using books: The doorbell rang Two halves	Recognise and describe one-half as one of two equal parts of a whole (ACMNA016) Fair feast Halving	Model and represent unit fractions, including 1/2, 1/4, 1/3 and 1/5 and their multiples, to a complete whole (ACMNA058) Halving Happy halving Chocolate Fractional wall Fractional triangles Bryony's triangle Fraction match Balance of halves	Compare and order common unit fractions and locate and represent them on a number line (ACMNA102)

Fractions and Decimals			
Early Stage 1 MAe-7NA	**Stage 1 MA1-7NA**	**Stage 2 MA2-7NA**	**Stage 3 MA3-7NA**
	Recognise and interpret common uses of halves, quarters and eighths of shapes and collections (ACMNA033) Fair feast Halving Happy halving Fractional wall Matching fractions	Count by quarters, halves and thirds, including with mixed numerals; locate and represent these fractions on a number line (ACMNA078) Chocolate Fractional triangles Fraction match Tumbling down Balance of halves Matching fractions	Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator (ACMNA103) Chocolate Fractional triangles More fraction bars Extending fraction bars Balance of halves Fraction lengths A4 fraction addition A4 fraction subtraction Linked chains
		Investigate equivalent fractions used in contexts (ACMNA077) Fractional wall Fraction match Tumbling down More fraction bars Extending fraction bars Fraction lengths Rectangle tangle	Recognise that the place value system can be extended beyond hundredths (ACMNA104) Greater than or less than? Spiralling decimals

Fractions and Decimals			
Early Stage 1 MAe-7NA	**Stage 1 MA1-7NA**	**Stage 2 MA2-7NA**	**Stage 3 MA3-7NA**
		Recognise that the place value system can be extended to tenths and hundredths, and make connections between fractions and decimal notation (ACMNA079) Greater than or less than?	Compare, order and represent decimals (ACMNA105) Greater than or less than? Spiralling decimals
			Compare fractions with related denominators and locate and represent them on a number line (ACMNA125) Rectangle tangle
			Solve problems involving addition and subtraction of fractions with the same or related denominators (ACMNA126) More fraction bars Extending fraction bars Fraction lengths A4 fraction addition A4 fraction subtraction Linked chains Fraction fascination

Fractions and Decimals			
Early Stage 1 MAe-7NA	**Stage 1 MA1-7NA**	**Stage 2 MA2-7NA**	**Stage 3 MA3-7NA**
			Find a simple fraction of a quantity where the result is a whole number, with and without the use of digital technologies (ACMNA127) How do you do it? Andy's marbles Fractions in a box
			Add and subtract decimals, with and without the use of digital technologies, and use estimation and rounding to check the reasonableness of answers (ACMNA128) Round the dice decimals 1 Round the dice decimals 2 Jumping
			Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without the use of digital technologies (ACMNA129) How do you do it? Route product Forgot the numbers

Fractions and Decimals			
Early Stage 1 MAe-7NA	**Stage 1 MA1-7NA**	**Stage 2 MA2-7NA**	**Stage 3 MA3-7NA**
			Multiply and divide decimals by powers of 10 (ACMNA130)
			Make connections between equivalent fractions, decimals and percentages (ACMNA131) Doughnut percents Matching fractions, decimals and percentages
			Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without the use of digital technologies (ACMNA132) Would you rather? (Note: This task needs to be modified to reference Australian notes/ coins)

Patterns and Algebra			
Early Stage 1 MAe-8NA	**Stage 1 MA1-8NA**	**Stage 2 MA2-8NA**	**Stage 3 MA3-8NA**
Sort and classify familiar objects and explain the basis for these classifications (ACMNA005)	Investigate and describe number patterns formed by skip counting and patterns with objects (ACMNA018) Five steps to 50 Biscuit decorations Noah Domino sequences I like… Light the lights Light the lights again	Describe, continue and create number patterns resulting from performing addition or subtraction (ACMNA060) Writing digits Eggs in baskets Birthday cakes What was in the box? Doing and undoing Secret number Ordering cards Which symbol? Ip Dip The tomato and the bean Number lines in disguise A mixed-up clock Three neighbours Magic V Build it up Diagonal sums	Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction (ACMNA107) Number lines in disguise Three neighbours Magic V Diagonal sums Domino sets Break it up! Holes Two and two

Patterns and Algebra			
Early Stage 1 MAe-8NA	**Stage 1 MA1-8NA**	**Stage 2 MA2-8NA**	**Stage 3 MA3-8NA**
Copy, continue and create patterns with objects and drawings Double trouble	Describe patterns with numbers and identify missing elements (ACMNA035) Buzzy bee Writing digits Domino sequences Domino number patterns What could it be? Half time Eggs in baskets The tall tower	Investigate the conditions required for a number to be even or odd and identify even and odd numbers (ACMNA051) Grouping goodies Largest even Light the lights Domino sorting Even and odd Ring a ring of numbers Always, sometimes or never? How odd Two numbers under the microscope More numbers in the ring Number differences Light the lights again	Use equivalent number sentences involving multiplication and division to find unknown quantities (ACMNA121) A square of numbers Trebling Becoming maths detectives Exploring number patterns you make Multiply multiples 1 Multiply multiples 2 Multiply multiples 3

Patterns and Algebra			
Early Stage 1 MAe-8NA	**Stage 1 MA1-8NA**	**Stage 2 MA2-8NA**	**Stage 3 MA3-8NA**
	Solve problems by using number sentences for addition or subtraction (ACMNA036) Same length trains Birthday cakes 4 Dom Unit differences Dicey addition Jumping squares The add and take-away path What was in the box? Super shapes	Use equivalent number sentences involving addition and subtraction to find unknown quantities (ACMNA083) Getting the balance right Number balance Which symbol? Super shapes Shape times shape Follow the numbers Two and two	Continue and create sequences involving whole numbers, fractions and decimals; describe the rule used to create the sequence (ACMNA133) Consecutive numbers Music to my ears Pebbles Becoming maths detectives Exploring number patterns you make The moons of Vuvv Up and down staircases Domino sets Break it up! Holes Button up Button up some more

Patterns and Algebra			
Early Stage 1 MAe-8NA	**Stage 1 MA1-8NA**	**Stage 2 MA2-8NA**	**Stage 3 MA3-8NA**
		Investigate and use the properties of even and odd numbers (ACMNA071) What could it be? Domino sorting Number round up Lots of biscuits! Even and odd Ring a ring of numbers Always, sometimes or never? How odd Two numbers under the microscope More numbers in the ring Number detectives Four-digit targets Take three numbers Number differences Play to 37 Consecutive numbers Subtraction surprise	Introduce the Cartesian coordinate system using all four quadrants (ACMMG143) Journeys in Numberland

Patterns and Algebra			
Early Stage 1 MAe-8NA	**Stage 1 MA1-8NA**	**Stage 2 MA2-8NA**	**Stage 3 MA3-8NA**
		Investigate number sequences involving multiples of 3, 4, 6, 7, 8 and 9 (ACMNA074) Odd times even Number lines in disguise Music to my ears Carrying cards Multiples grid Times table shifts Table patterns go wild! Follow the numbers Round and round the circle	

Patterns and Algebra			
Early Stage 1 MAe-8NA	**Stage 1 MA1-8NA**	**Stage 2 MA2-8NA**	**Stage 3 MA3-8NA**
		Explore and describe number patterns resulting from performing multiplication (ACMNA081) Doubling fives Double or halve Odd times even Ordering cards Which symbol? Magic plant The amazing splitting plant The tomato and the bean The deca tree Table patterns go wild! Flashing lights Pebbles Round and round the circle Holes	
		Solve word problems by using number sentences involving multiplication or division where there is no remainder (ACMNA082) Are you well balanced? Pebbles Multiply multiples 1 Multiply multiples 2 Multiply multiples 3	