Making connections to the Week of Inspirational Math lessons

Resource 3: Mapping to Week 3 2017 lessons

Each year the team at youcubed design a Week of inspirational Math (WIM) with lessons for a range of grades. They have now designed three 'weeks' of tasks over the last three years. Teachers in NSW have been getting hooked on Jo Boaler, her research into Mathematical Growth Mindsets and also the wonderful lesson resources developed by Boaler and her colleagues at www.youcubed.org

This third resource maps the lessons from the Week of Inspirational Math Week 3 in 2017 to the NSW mathematics K-10 syllabus outcomes. I have mapped to the overarching outcomes, sub strands and general content links, not necessarily to the dot point level for all lesson activities. Many of the WIM lessons bring together a number of concepts, these concept connections should also be reflected in your programming where concepts are not taught in isolation. The lessons in this resource are the primary to middle school level lessons (up to grades 6-8), I have not mapped the lessons that link to upper secondary (grades 9-12).

Note: I have linked the tasks directly to the outcomes where that concept or content is addressed. You as the teacher may feel that your students are ready to tackle some of these activities in earlier grades, this decision is up to you e.g. Messing with Pascal Bonus Day WIM 2017 is for exploration in Grades 3-5, however Pascal's triangle sits within Stage 6 of the NSW mathematics syllabus (in the topic of Combinatorics when exploring binomial expansion). As Pascal's triangle is an interesting pattern and based on number patterns explored in earlier stages of our syllabus, it is suitable for Stage 2 onwards.

References

Boaler, J. (2013). Ability and Mathematics: the mindset revolution that is reshaping education. FORUM, 55, 1, 143-152.

Board of Studies NSW. (2002). Mathematics K-6 syllabus. Sydney, NSW.: Author.

Lessons from the Week of Inspirational Math https://www.youcubed.org/week-inspirational-math/

See further papers here https://www.youcubed.org/resource/short-impact-papers/

Week of Inspirational Math 2017

Grade Kindergarten https://www.youcubed.org/weeks/week-3-grade-k/

You may want to visit the website link above to access any videos and PowerPoint presentations that accompany the lessons. The links within this table link directly to the lesson plans.

WIM lesson	NSW syllabus outcomes	Sub strand and content links
Day 1 Sorting Emoji, shapes and patterns sorting	MAe-1WM	*Communicating* Describes how a set of shapes was sorted
	MAe-2WM	*Problem Solving* Creates patterns and recognise errors in patterns
	MAe-3WM	*Reasoning* Explains why the shapes that are grouped together belong (what's the same) Recognises and explains how a group of shapes has been sorted
	MAe-8NA	*Patterns and Algebra* Sorts shapes into smaller groups Sorts shapes in different ways Describes patterns as repeating **Note:** missing elements in patterns appears in Stage 1 Patterns and Algebra 2 and is in reference to number patterns. However, students in Kindergarten could explore missing elements in shape patterns in Kindergarten
	MAe-15MG	*Two-Dimensional Shapes* Sorts and describes familiar shapes Makes designs (e.g. patterns) using a selection of shapes

WIM lesson	NSW syllabus outcomes	Sub strand and content links
Day 2 Count on me Counting with fingers	MAe-1WM	*Communicating* Uses everyday language to communicate mathematical understanding of numbers Recognises that the last number said represents the total (trust the count) Describes the action of combining numbers
	MAe-2WM	*Problem Solving* Uses objects (such as hands) to explore mathematical problems Applies counting strategies to solve problems
	MAe-3WM	*Reasoning* Applies counting to justify answers Describes numbers referring to if the numbers are equal or similar/ different Explains or demonstrates how an answer was obtained
	MAe4NA	*Whole Numbers* Counts forwards and backwards Represents numbers using objects (such as fingers) pictures, words and numerals Uses five as a reference (benchmark) to make other numbers Counts with one-to-one correspondence
	MAe-5NA	*Addition and Subtraction* Models addition using objects (such as fingers) Creates and recognises combinations to 10 Counts forwards by ones to add Uses visual representations of number to assist with addition problems
Day 3 Framing rectangles Square tiles and framing rectangles	MAe-1WM	*Communicating* Asks and responds to questions about given shapes
	MAe-2WM	*Problem Solving* Moves (turns and flips) two-dimensional shapes (squares) to match a given space (rectangles) in solving the problem

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MAe-3WM	*Reasoning* Explains the importance of closing the shape (the need for no gaps when making the rectangle)
	MAe-6NA	*Multiplication and Division* Models equal groups (e.g. rows of tiles) Groups concrete materials to solve problems Records grouping informally using pictures, words and numerals
	MAe-10MG	*Area* Identifies area and covers a space with smaller shapes (e.g. square tiles) Uses comparative language to describe area (smaller, bigger etc)
	MAe-15MG	*Two-Dimensional Space* Manipulates squares and rectangles and describes their features Makes representations of two-dimensional shapes (e.g. rectangles) using a variety of materials (e.g. square tiles, paper tile)
	MA1-1WM	*Communicating* Discusses strategies used to make different areas Uses some mathematical language to describe the squares and rectangles made with the tiles Determines and distinguishes between the 'number of groups' and the 'number in each group' when describing collections of objects Uses objects to represent counting patterns Describes how number patterns are made and how they can be continued
	MA1-2WM	*Problem Solving* Uses knowledge of rectangles and their features to solve mathematical problems Finds the total using skip counting or repeated addition Investigates and solve problems based on number patterns

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA1-3WM	*Reasoning* Describes why the area remains constant when units (tiles) are rearranged Recognises that shapes with the same name may have sides of equal or different lengths
	MA1-6NA	*Multiplication and Division 1 and 2* Skip counts by twos, fives etc Models and describes collections of objects Uses concrete materials to form arrays Models the commutative property of multiplication, e.g. '3 groups of 2 is the same as 2 groups of 3'
	MA1-8NA	*Patterns and Algebra 1* Investigates and describe number patterns formed by skip counting and patterns with objects
	MA1-10MG	*Area 1* Uses uniform informal units to measure area (e.g. tiles)
	MA1-15MG	*Two-Dimensional Space 2* Makes representations of two-dimensional shapes in different orientations using concrete materials Combines single shapes and arrangements of shapes to form new shapes
Day 4 Building shapes Notes: The length of string used in this lesson is in feet, use string approx. 2.5 – 3 m long. The lesson also investigates angles,	MAe-1WM	*Communicating* Asks and respond to questions that help identify a particular shape Describes and names familiar two-dimensional shapes in the environment Describes the difference between three-dimensional objects and two-dimensional shapes using everyday language
	MAe-2WM	*Problem Solving* Identifies circles, triangles, squares and rectangles in pictures and the environment

WIM lesson	NSW syllabus outcomes	Sub strand and content links
angles are not formally introduced until Stage 2 of the NSW syllabus. Angles can still be explored in ES1 and S1. The term 'vertex' is introduced in Stage 1.	MAe-3WM	*Reasoning* Recognises and explains when a two-dimensional shape has been made using everyday langauge
	MAe-15MG	*Two-Dimensional Space* Represents and names shapes in different orientations Manipulates circles, triangles, squares and rectangles, and describe their features using everyday language Makes representations of two-dimensional shapes using a variety of materials
	MAe-14MG	*Three-Dimensional Space* Makes models using a variety of three-dimensional objects and describe the models
	MA1-1WM	*Communicating* Describes features of two-dimensional shapes using the terms 'side' and 'vertex' (can include angle) Explains or demonstrates how a simple model was made
	MA1-2WM	*Problem Solving* Uses knowledge of the features of two-dimensional shapes to solve problems
	MA1-3WM	*Reasoning* Selects a shape from a description of its features Justifies answers using knowledge of features of specific shapes
	MA1-15MG	*Two-Dimensional Space 1 and 2* Identifies parallel lines in pictures and the environment Manipulates, compares and describes features of two-dimensional shapes Identifies and names two-dimensional shapes based on sides and other features Makes representations of two-dimensional shapes in different orientations using concrete materials

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA1-14MG	*Three-Dimensional Space 1 and 2* Manipulates and describe familiar three-dimensional objects Distinguishes between objects, which are 'three-dimensional' (3D), and shapes, which are 'two-dimensional' (2D), and describe the differences informally Represents three-dimensional objects by making simple models
Day 5 Game of totals	MAe-1WM	*Communicating* Uses everyday language to communicate mathematical understanding of numbers Recognises that the last number said represents the total (trust the count) Describes the action of combining numbers
	MAe-2WM	*Problem Solving* Uses objects (such as hands) to explore mathematical problems Applies counting strategies to solve problems Applies strategies that have been demonstrated by other students
	MAe-3WM	*Reasoning* Applies counting to justify answers Describes numbers referring to if the numbers are equal or similar/ different Explains or demonstrates how an answer was obtained
	MAe-4NA	*Whole Numbers* Counts forwards and backwards Represents numbers using objects (such as fingers) pictures, words and numerals Uses five as a reference (benchmark) to make other numbers Counts with one-to-one correspondence

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MAe-5NA	*Addition and Subtraction* Models addition using objects (such as fingers) Creates and recognises combinations for numbers to at least 10 Counts forwards by ones to add Uses visual representations of number to assist with addition problems e.g. ten frames
Bonus Three Block Tower Four block towers Notes: This lesson also has links to combinations (Chance 1 in Stage 2 and in Probability in Stage 4)	MAe-1WM	*Communicating* Describes how a set of shapes (e.g. cubes of different colours) was sorted Makes representations of different patterns using drawings and objects
	MAe-2WM	*Problem Solving* Creates patterns involving colour
	MAe-3WM	*Reasoning* Explains why the patterns are different Recognises and explains how they went about creating the patterns (e.g. started with a red block first each time) Uses concrete materials to support conclusions
	MAe-8NA	*Patterns and Algebra* Sorts shapes in different ways Continue a pattern with objects Describes patterns using everyday language

Week of Inspirational Math 2017

Grades 1-2 https://www.youcubed.org/weeks/week-3-grade-1-2/

You may want to visit the website link above to access any videos and PowerPoint presentations that accompany the lessons. The links within this table link directly to the lesson plans.

Note: These Grade 1-2 lessons are extensions of the Kindergarten lessons. The syllabus links below are additional Stage 1 links (if not linked above) and links for any additional extension tasks included in these lessons.

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	Sorting emojis	
Day 1 Sorting Sorting emojis and sorting puzzles	MA1-1WM	*Communicating* Explains the attribute used when sorting two-dimensional shapes Describes data displayed in simple tables and picture graphs Uses displays to communicate information
	MA1-3WM	*Reasoning* Explains the attribute used when sorting two-dimensional shapes Selects a shape (e.g. emoji) from a description of its features
	MA1-15MG	*Two-Dimensional Space 1* Sorts two-dimensional shapes (e.g. emojis) by a given attribute
	MA1-17SP	*Data 2* Identifies categories of data and use them to sort data Displays data using lists and tables Interprets information presented in lists, tables and picture graphs
	Sorting puzzles	

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA1-1WM	*Communicating* Uses objects to represent counting patterns Explains the attribute used when sorting two-dimensional shapes Describes features of two-dimensional shapes using the terms 'side' and 'vertex'
	MA1-2WM	*Problem Solving* Recognises when an error occurs in a pattern and explain what is wrong
	MA1-3WM	*Reasoning* Explains the attribute used when sorting two-dimensional shapes Recognises that the name of a shape does not change when the shape changes its orientation
	MA1-8NA	*Patterns and Algebra 1* Recognises, copies and continues patterns with objects or symbols Creates, records and describes patterns with objects or symbols Describes a repeating pattern of objects or symbols
	MA1-15MG	*Two-Dimensional Space 1 and 2* Sorts two-dimensional shapes by a given attribute Manipulates, compares and describes features of two-dimensional shapes Identifies and name two-dimensional shapes presented in different orientations Makes representations of two-dimensional shapes in different orientations using concrete materials
Day 2 Count on me Counting fingers and counting piano keys	MA1-1WM	*Communicating* Describes combinations for numbers using words such as 'more', 'less' and 'double'
	MA1-2WM	*Problem Solving* Models and record patterns for individual numbers by making all possible whole-number combinations

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA1-3WM	*Reasoning* Supports conclusions by explaining or demonstrating how answers were obtained
	MA1-5NA	*Addition and Subtraction 1* Uses concrete materials to model addition and subtraction problems involving one- digit numbers Records number sentences in a variety of ways Recognises, recalls and records combinations of two numbers that add to 10 Creates, records and recognises combinations of two numbers that add to numbers up to and including 9 Uses concrete materials to model the commutative property for addition
Day 3 Framing rectangles	*See Stage 1 syllabus links on same activity in Kindergarten section.*	
Day 4 Building shapes	*See Stage 1 syllabus links on same activity in Kindergarten section.*	
Day 5 Game of totals	MA1-1WM	*Communicating* Describes combinations for numbers using words such as 'more', 'less' and 'double'
	MA1-2WM	*Problem Solving* Chooses and applies efficient strategies for addition and subtraction
	MA1-3WM	*Reasoning* Supports conclusions by explaining or demonstrating how answers were obtained Checks given number sentences to determine if they are true or false and explain why

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA1-5NA	*Addition and Subtraction 1* Uses concrete materials to model addition and subtraction problems involving one- digit numbers Records number sentences in a variety of ways Recognises, recalls and records combinations of two numbers that add to 10 Creates, records and recognises combinations of two numbers that add to numbers up to and including 9 Recognises and uses the symbols for plus (+), minus (–) and equals (=) Records number sentences in a variety of ways using drawings, words, numerals and mathematical symbols Uses and records a range of mental strategies to solve addition and subtraction problems involving one-digit numbers Uses the equals sign to record equivalent number sentences involving addition
Bonus Three Block Towers Four block towers	MA1-1WM	*Communicating* Describes mathematical situations and methods using everyday and some mathematical language, actions, materials, diagrams and symbols Uses objects to represent counting patterns
	MA1-2WM	*Problem Solving* Uses objects, diagrams and technology to explore mathematical problems
	MA1-3WM	*Reasoning* Supports conclusions by explaining or demonstrating how answers were obtained
	MA1-5NA	*Addition and Subtraction 1* Creates, records and recognises combinations (Note: this is in reference to number combinations, but the same understanding can be applied to this task with the coloured blocks)

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA1-8NA	*Patterns and Algebra 1* Identifies and describes patterns Creates, records and describes patterns with objects or symbols

Week of Inspirational Math 2017

Grades 3-5 https://www.youcubed.org/weeks/week-3-grade-3-5/

You may want to visit the website link above to access any videos and PowerPoint presentations that accompany the lessons. The links within this table link directly to the lesson plans.

Note: The Grade 3-5 Days 2, 4 and 5 are extensions of the Kindergarten and Grade 1-2 lessons. The syllabus links below are additional Stage 2 and Stage 3 links and links for any additional extension tasks included in these lessons.

WIM lesson	NSW syllabus outcomes	Sub strand and content links
Day 1 Halves Exploring halving	MA2-1WM	*Communicating* Uses appropriate terminology to describe, and symbols to represent, mathematical ideas Recognises that fractions are used to describe one or more parts of a whole where the parts are equal Describes shapes formed from a combination of common shapes (or by splitting/ dividing a shape)
	MA2-2WM	*Problem Solving* Investigate equivalences using various methods (e.g. cutting up paper, drawing different representations of half) Selects and uses appropriate mental or written strategies, or technology, to solve problems
	MA2-3WM	*Reasoning* Checks the accuracy of a statement and explains the reasoning used

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA2-7NA	*Fractions and Decimals 1 and 2* Models and represents unit fractions, including halves and quarters Compares unit fractions using diagrams Models, compares and represents fractions with denominators of 2, 4 Models, compares and represents the equivalence of fractions with related denominators by redividing the whole, using concrete materials and diagrams Records equivalent fractions using diagrams
	MA2-15MG	*Two-Dimensional Space 1 and 2* Identifies lines of symmetry in pictures (and relates these to aspects of halving) Splits a given shape into two or more common shapes and describe the result (splits shapes to create halves) Records the arrangements of common shapes used to create other shapes (arranging parts of a rectangle or square to show various representations of half) Create symmetrical patterns, designs, pictures and shapes (Note: some designs may be symmetrical some may not- this activity is still a good opportunity to discuss symmetrical designs)
	MA3-1WM	*Communicating* Describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions Uses selected words to describe each step of the solution process
	MA3-2WM	*Problem Solving* Selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations
	MA3-3WM	*Reasoning* Compares the relative size of fractions drawn on the same diagram Uses estimation to verify that an answer is reasonable Gives a valid reason for supporting one possible solution over another

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA3-7NA	*Fractions and Decimals 1 and 2* Models and represents strategies, including using diagrams, to add fractions (oe fractional parts to make a whole) Models, compares and represents fractions of a whole object, a whole shape and a collection of objects Finds equivalent fractions by re-dividing the whole, using diagrams Records equivalent fractions using diagrams
	MA3-8NA	*Patterns and Algebra 1 and 2* Describes, continues and creates patterns with fractions Creates, with materials, a variety of patterns using whole numbers, fractions or decimals Creates simple geometric patterns using concrete materials
Day 2 Game of totals	MA2-1WM	*Communicating* Discusses and compares different methods of addition Uses appropriate terminology to describe, and symbols to represent, mathematical ideas
	MA2-2WM	*Problem Solving* Chooses and applies efficient strategies for addition Poses simple addition problems and applies appropriate strategies to solve them Explains problem-solving strategies using language, actions, materials and drawings
	MA2-3WM	*Reasoning* Explains and checks solutions to problems, including by using the inverse operation Explains how an answer was obtained and compare their own method of solution with the methods of other students

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA2-5NA	*Addition and Subtraction 1* Recalls addition facts for single-digit numbers Adds three or more single-digit numbers Applies known single-digit addition facts to mental strategies for addition Uses concrete materials to model the addition of two or more numbers Selects, uses and record a variety of mental strategies to solve addition problems
	MA3-1WM	*Communicating* Describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions Reflects on their chosen method of solution for a problem, considering whether it can be improved
	MA3-2WM	*Problem Solving* Selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations
	MA3-3WM	*Reasoning* Gives a valid reason for supporting one possible solution over another Explains how an answer was obtained for an addition problem and justify the selected calculation method
	MA3-5NA	*Addition and Subtraction 1* Uses the term 'sum' to describe the result of adding two or more numbers Records the strategy used to solve addition word problems
Day 3 One cut geometry	MA2-1WM	*Communicating* Uses appropriate terminology to describe, and symbols to represent, mathematical ideas Follows written or verbal instructions to create a common shape
	MA2-2WM	*Problem Solving* Explains problem-solving strategies using language, actions, materials and drawings

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA2-3WM	*Reasoning* Checks the accuracy of a statement and explains the reasoning used Explains how an answer was obtained and compare their own method of solution with the methods of other students
	MA2-15MG	*Two-Dimensional Space 1 and 2* Manipulates, compares and describes features of two-dimensional shapes Draws representations of regular and irregular two-dimensional shapes in different orientations Constructs regular and irregular two-dimensional shapes from a variety of materials Identifies lines of symmetry in pictures Records the arrangements of common shapes used to create other shapes
	MA3-1WM	*Communicating* Describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions Reflects on their chosen method of solution for a problem, considering whether it can be improved
	MA3-2WM	*Problem Solving* Selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations
	MA3-3WM	*Reasoning* Gives a valid reason for supporting one possible solution over another Explains how an answer was obtained for an addition problem and justify the selected calculation method

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA3-15MG	*Two-Dimensional Space 1 and 2* Manipulates, identifies and names right-angled, equilateral, isosceles and scalene triangles Identifies and draws regular and irregular two-dimensional shapes Uses the terms 'translate', 'reflect' and 'rotate' to describe the movement of two-dimensional shapes Rotates a graphic or object through a specified angle about a particular point Describes the effect when a two-dimensional shape is translated, reflected or rotated Identifies and names 'diagonals' of convex two-dimensional shapes
Day 4 Building Shapes	MA2-1WM	*Communicating* Uses appropriate terminology to describe, and symbols to represent, mathematical ideas Follows written or verbal instructions to create a common shape Describes similarities and differences between prisms (including cubes) and pyramids
	MA2-2WM	*Problem Solving* Explains problem-solving strategies using language, actions, materials and drawings
	MA2-3WM	*Reasoning* Checks the accuracy of a statement and explains the reasoning used Explains how an answer was obtained and compare their own method of solution with the methods of other students
	MA2-15MG	*Two-Dimensional Space 1* Manipulates, compares and describes features of two-dimensional shapes Draws representations of regular and irregular two-dimensional shapes in different orientations Constructs regular and irregular two-dimensional shapes from a variety of materials
	MA2-14MG	*Three-Dimensional Space 1* Uses a variety of materials to make models of prisms (including cubes) and pyramids

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA3-1WM	*Communicating* Describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions Reflects on their chosen method of solution for a problem, considering whether it can be improved Describes to another student how to construct or draw a three-dimensional object
	MA3-2WM	*Problem Solving* Selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations Connects the edges of prisms and pyramids with the construction of their skeletal models
	MA3-3WM	*Reasoning* Gives a valid reason for supporting one possible solution over another Explains how an answer was obtained for an addition problem and justify the selected calculation method Recognises that the properties of shapes do not change when shapes are translated, reflected or rotated
	MA3-15MG	*Two-Dimensional Space 1 and 2* Manipulates, identifies and names right-angled, equilateral, isosceles and scalene triangles Identifies and draws regular and irregular two-dimensional shapes Uses the terms 'translate', 'reflect' and 'rotate' to describe the movement of two-dimensional shapes Rotates an object through a specified angle about a particular point Describes the effect when a two-dimensional shape is translated, reflected or rotated

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA3-14MG	*Three-Dimensional Space 1 and 2* Compares, describes and names prisms and pyramids Names prisms and pyramids according to the shape of their base Identifies, describes and compares the properties of prisms and pyramids Visualises and sketches three-dimensional objects from different views, including top, front and side views Creates prisms and pyramids using a variety of materials Creates skeletal models of prisms and pyramids Constructs three-dimensional models of prisms and pyramids
Day 5 Framing rectangles	MA2-1WM	*Communicating* Explains problem-solving strategies using language, actions, materials and drawings Describes methods used in solving multiplication problems Discusses strategies used to estimate area in square centimetres, eg visualising repeated units
	MA2-2WM	*Problem Solving* Represents and solves problems involving multiplication using efficient mental and written strategies
	MA2-3WM	*Reasoning* Explains how an answer was obtained and compare their own method of solution with the methods of other students Makes generalisations about numbers and number relationships

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA2-6NA	*Multiplication and Division 1 and 2* Uses mental strategies to recall multiplication facts for multiples of two, three, five and ten Links multiplication and division facts using groups or arrays Models and applies the commutative property of multiplication Selects, uses and records a variety of mental strategies, and appropriate digital technologies, to solve simple multiplication problems Uses mental strategies to build multiplication facts (e.g. using known facts to work out unknown facts, using the relationship between multiplication facts)
	MA2-10MG	*Area 1 and 2* Uses a 10 cm × 10 cm tile (or grid) to find the areas of rectangles (including squares) Measures the areas of rectangles (including squares) Estimates the areas of rectangles (including squares) Compares two or more areas by informal means
	MA2-15MG	*Two-Dimensional Space 1* Uses measurement to establish and describe side properties of the special quadrilaterals Constructs regular and irregular two-dimensional shapes from a variety of materials
	MA3-1WM	*Communicating* Uses a table or similar organiser to record methods used to solve problems Uses selected words to describe each step of the solution process
	MA3-2WM	*Problem Solving* Estimates solutions to problems and check to justify solutions Checks answers to mental calculations using digital technologies
	MA3-3WM	*Reasoning* Gives a valid reason for supporting one possible solution over another Explains that the area of a rectangle can be found by multiplying the length by the width Recognises that rectangles with the same area may have different dimensions

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA3-6NA	*Multiplication and Division 1* Applies appropriate mental and written strategies, and digital technologies, to solve multiplication word problems Records the strategy used to solve multiplication word problems
	MA3-10MG	*Area 1 and 2* Establishes the relationship between the lengths, widths and areas of rectangles (including squares) Records, using words, the method for finding the area of any rectangle, eg 'Area of rectangle = length × width' Calculates areas of rectangles (including squares) Records calculations used to find the areas of rectangles (including squares) Applies measurement skills to solve problems involving the areas of rectangles (including squares) Investigates and compare the areas of rectangles that have the same perimeter
Bonus Messing with Pascal Note: Pascal's triangle is not formally introduced in the NSW mathematics syllabus until Stage 6 (in the topic of Combinatorics when studying binomial expansion). Pascal's triangle is however an interesting pattern that	MA2-1WM	*Communicating* Asks questions about how number patterns have been created and how they can be continued Describes the position of each term in a given number pattern Describes how the next term in a number pattern is calculated
	MA2-2WM	*Problem Solving* Investigates visual number patterns
	MA2-3WM	*Reasoning* Justifies solutions when completing number patterns

WIM lesson	NSW syllabus outcomes	Sub strand and content links
can be explored in earlier years.	MA2-8NA	*Patterns and Algebra 1 and 2* Describes, continues and creates number patterns resulting from performing addition or subtraction Models, describes and then record number patterns using diagrams, words or symbols Creates and continues a variety of number patterns that increase or decrease, and describe them in more than one way Investigates number sequences involving multiples of 3, 4, 6, 7, 8 and 9 Finds a higher term in a number pattern resulting from performing multiplication, given the first few terms
	MA3-1WM	*Communicating* Describes patterns using the terms 'increase' and 'decrease' Interprets explanations written by peers and teachers that accurately describe geometric and number patterns
	MA3-2WM	*Problem Solving* Describes how number patterns have been created and how they can be continued
	MA3-3WM	*Reasoning* Makes generalisations about numbers and number relationships Explains how square and triangular numbers are created Recognises and explains the relationship between the way each pattern of numbers is created and the name of the number group
	MA3-4NA	*Whole Numbers 2* Identifies and describes properties of prime, composite, square and triangular numbers Models square and triangular numbers and record each number group in numerical and diagrammatic form

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA3-8NA	*Patterns and Algebra 1 and 2* Identifies, continues and creates simple number patterns involving addition and subtraction Creates, with materials or digital technologies, a variety of patterns using whole numbers Continues and creates number patterns, with and without the use of digital technologies, using whole numbers Describes the number pattern in a variety of ways and record descriptions using words Determines the rule to describe the pattern Uses the rule to calculate the value of the term for a large position number

Week of Inspirational Math 2017

Grades 6-8 https://www.youcubed.org/weeks/week-3-grade-6-8/

You may want to visit the website link above to access any videos and PowerPoint presentations that accompany the lessons. The links within this table link directly to the lesson plans.

Note: Days 1, 3, 5 and the bonus "Messing with Pascal" for Grades 6-8 are similar to the lesson activities for Grades 3-5 above therefore have not been repeated here. Links can be extended into Stage 4 outcomes- particularly for working mathematically.

WIM lesson	NSW syllabus outcomes	Sub strand and content links
Day 1 Building shapes	*See Grades 3-5 section for Stage 3 syllabus links.*	
Day 2 Toothpick squares Toothpick squares number talk and activities (includes a gallery walk)	MA2-1WM	*Communicating* Asks questions about how number patterns have been created and how they can be continued Describes the position of each term in a given number pattern Describes how the next term in a number pattern is calculated

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA2-2WM	*Problem Solving* Investigates visual number patterns
	MA2-3WM	*Reasoning* Justifies solutions when completing number patterns
	MA2-8NA	*Patterns and Algebra 1 and 2* Describes, continues and creates number patterns resulting from performing addition or subtraction Identifies and describes patterns when counting forwards or backwards by threes, fours, sixes, sevens, eights and nines Models, describes and then record number patterns using diagrams, words or symbols Creates and continues a variety of number patterns that increase or decrease, and describe them in more than one way Investigates number sequences involving multiples of 3, 4, 6, 7, 8 and 9 Finds a higher term in a number pattern resulting from performing multiplication, given the first few terms
	MA2-15MG	Two-Dimensional Space 1 Manipulates, compares and describes features of two-dimensional shapes Recognises the vertices of two-dimensional shapes as the vertices of angles that have the sides of the shape as their arms Constructs regular and irregular two-dimensional shapes from a variety of materials
	MA3-1WM	*Communicating* Describes patterns using the terms 'increase' and 'decrease' Interprets explanations written by peers and teachers that accurately describe geometric and number patterns
	MA3-2WM	*Problem Solving* Describes how number patterns have been created and how they can be continued

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA3-3WM	*Reasoning* Makes generalisations about numbers and number relationships Recognises and explains the relationship between the way each pattern of numbers is created and the name of the number group
	MA3-8NA	*Patterns and Algebra 1 and 2* Identifies, continues and creates simple number patterns involving addition and subtraction Creates, with materials or digital technologies, a variety of patterns using whole numbers Continues and creates number patterns, with and without the use of digital technologies, using whole numbers Creates simple geometric patterns using concrete materials Completes a table of values for a geometric pattern and describe the pattern in words Describes the number pattern in a variety of ways and record descriptions using words Determines the rule to describe the pattern Uses the rule to calculate the value of the term for a large position number
Day 3 Cut out geometry	*See Grades 3-5 section for Stage 3 syllabus links.*	
Day 4 Art of Patterns Art and math and explore structure	MA2-1WM	*Communicating* Recognises and describes the use of three-dimensional objects in a variety of contexts Asks questions about how number patterns have been created and how they can be continued Describes the position of each term in a given number pattern Describes how the next term in a number pattern is calculated
	MA2-2WM	*Problem Solving* Investigates visual number patterns

Primary Learning

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA2-3WM	*Reasoning* Compares their own drawings of three-dimensional objects with other drawings and photographs Justifies solutions when completing number patterns
	MA2-8NA	*Patterns and Algebra 1 and 2* Describes, continues and creates number patterns resulting from performing addition or subtraction Identifies and describes patterns when counting forwards or backwards by threes, fours, sixes, sevens, eights and nines Models, describes and then record number patterns using diagrams, words or symbols Creates and continues a variety of number patterns that increase or decrease, and describe them in more than one way Investigates number sequences involving multiples of 3, 4, 6, 7, 8 and 9 Finds a higher term in a number pattern resulting from performing multiplication, given the first few terms
	MA2-14MG	*Three-Dimensional Space 1 and 2* Makes models of three-dimensional objects and describe key features Identifies and names three-dimensional objects as prisms (including cubes) Uses a variety of materials to make models of prisms (including cubes) Sketches prisms (including cubes) Sketches three-dimensional objects from different views, including top, front and side views Draws different views of an object constructed from connecting cubes on isometric grid paper

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA3-1WM	*Communicating* Recognises a cube as a special type of prism Describes to another student how to construct or draw a three-dimensional object Describes patterns using the terms 'increase' and 'decrease' Interprets explanations written by peers and teachers that accurately describe geometric and number patterns
	MA3-2WM	*Problem Solving* Connects the edges of prisms with the construction of their skeletal models Describes how number patterns (and geometric patterns) have been created and how they can be continued
	MA3-3WM	*Reasoning* Reflects on their own drawing of a three-dimensional object and consider how it can be improved Makes generalisations about numbers and number relationships Recognises and explains the relationship between the way each pattern of numbers is created and the name of the number group
	MA3-8NA	*Patterns and Algebra 1 and 2* Identifies, continues and creates simple number patterns involving addition and subtraction Creates, with materials or digital technologies, a variety of patterns using whole numbers Continues and creates number patterns, with and without the use of digital technologies, using whole numbers Creates simple geometric patterns using concrete materials Completes a table of values for a geometric pattern and describe the pattern in words Describes the number pattern in a variety of ways and record descriptions using words Determines the rule to describe the pattern Uses the rule to calculate the value of the term for a large position number

WIM lesson	NSW syllabus outcomes	Sub strand and content links
	MA3-14MG	*Three-Dimensional Space 1 and 2* Compares, describes and names prisms Identifies, describes and compares the properties of prisms (e.g. number of faces, edges, vertices) Visualises and sketches three-dimensional objects from different views, including top, front and side views Creates prisms and pyramids using a variety of materials, eg plasticine, paper or cardboard nets, connecting cubes Creates skeletal models of prisms Constructs three-dimensional models of prisms and sketches the front, side and top views Constructs three-dimensional models of prisms, given drawings of different views
Day 5 Framing rectangles	*See Grades 3-5 section for Stage 3 syllabus links. This lesson is slightly different from the Grade 3-5 version.*	
Bonus Messing with Pascal	*See Grades 3-5 section for Stage 3 syllabus links.*	
Bonus Computational thinking by Polyup	Polyup is an online interactive site that addresses concepts such as Number Sense, Operations, Order of Operations, Functions, Sequences, Numerical Methods, Logical Thinking, Algorithmic Thinking, Intermediate Problem Solving. Syllabus links for Polyup will be dependent on which tasks your students undertake.	

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