MATHS OVERVIEW-YEAR 2 TERM 3

YEAR LEVEL	CONTENT DESCRIPTORS
Year 2	***Number & Algebra***
DURATION	✓ **ACMNA026** Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences.
Term 3	**ACMNA027** Recognise, model, represent and order numbers to at least 1000
LINKS TO OTHER LA's	✓ **ACMNA028** Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting
	ACMNA029 Explore the connection between addition and subtraction
	ACMNA030 Solve simple addition and subtraction problems using a range of efficient mental and written strategies
	✓ **ACMNA031** Recognise and represent multiplication as repeated addition, groups and arrays
	ACMNA032 Recognise and represent division as grouping into equal sets and solve simple problems using these representations
	✓ **ACMNA033** Recognise and interpret common uses of halves, quarters and eighths of shapes and collections
	ACMNA034 Count and order small collections of Australian coins and notes according to their value
	✓ **ACMNA035** Describe patterns with numbers and identify missing elements
	✓ **ACMNA036** Solve problems by using number sentences for addition or subtraction
	Measurement & Geometry
	✓ **ACMMG037** Compare and order several shapes and objects based on appropriate uniform informal units length, area, volume and capacity using
	ACMMG038 Compare masses of objects using balance scales
	ACMMG039 Tell time to the quarter-hour, using the language of 'past' and 'to'
	ACMMG040 Name and order months and seasons
	ACMMG041 Use a calendar to identify the date and determine the number of days in each month
	ACMMG042 Describe and draw two-dimensional shapes, with and without digital technologies
	✓ **ACMMG043** Describe the features of three-dimensional
	ACMMG044 Interpret simple maps of familiar locations and identify the relative positions of key features
	✓ **ACMMG045** Investigate the effect of one-step slides and flips with and without digital technologies
	ACMMG046 Identify and describe half and quarter turns
	Statistics & Probability
	ACMSP047 Identify practical activities and everyday events that involve chance. Describe outcomes as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible'
	ACMSP048 Identify a question of interest based on one categorical variable. Gather data relevant to the question
	ACMSP049 Collect, check and classify data
	ACMSP050 Create displays of data using lists, table and picture graphs and interpret them
	DEVELOPING INQUIRING & REFLECTIVE LEARNERS
	☐COMMUNITY CONTRIBUROR ☐LEADER AND COLLABORATOR ☐EFFECTIVE COMMUNICATOR ☐ACTIVE INVESTIGATOR ☐DESIGNER AND CREATOR ☐QUALITY PRODUCER

Proficiency Strand

The proficiency strands *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra, Measurement and Geometry,* and *Statistics and Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year level:

Understanding includes connecting number calculations with counting sequences, partitioning and combining numbers flexibly, identifying and describing the relationship between addition and subtraction and between multiplication and division

Fluency includes counting numbers in sequences readily, using informal units iteratively to compare measurements, using the language of chance to describe outcomes of familiar chance events and describing and comparing time durations

Problem Solving includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, and matching transformations with their original shape

Reasoning includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations, and creating and interpreting simple representations of data

Mathematics Achievement Standard

By the end of Year 2, students recognise increasing and decreasing number sequences involving 2s, 3s and 5s. They represent multiplication and division by grouping into sets. They associate collections of Australian coins with their value. Students identify the missing element in a number sequence. Students recognise the features of three-dimensional objects. They interpret simple maps of familiar locations. They explain the effects of one-step transformations. Students make sense of collected information.

Students count to and from 1000. They perform simple addition and subtraction calculations using a range of strategies. They divide collections and shapes into halves, quarters and eighths. Students order shapes and objects using informal units. They tell time to the quarter hour and use a calendar to identify the date and the months included in seasons. They draw two- dimensional shapes. They describe outcomes for everyday events. Students collect data from relevant questions to create lists, tables and picture graphs.

TOPIC	CONTENT DESCRIPTOR	KEY IDEA	Pre-ASSESS	ASSESSMENT	INVESTIGATION	STUDENT JOURNAL	RESOURCES
2.3.1. Think Board 2	ACMNA036 Solve problems by using number sentences for addition or subtraction.	Students will use a Think Board to link different ways of representing addition and subtraction problems including words, concrete materials, pictures and number sentences. This will assist them in solving word problems that contain unknown quantities. Proficiency Strand: Problem Solving – using number sentences that represent problem situations; formulating problems from authentic situations.	The Think Board helps students to find connections between the different ways of representing a problem. This helps students to focus on the meaning of the operation rather than on just calculating to find an answer. Model working through a word problem using the Think Board. Progress from MAG 2.2.5 where students were using the standard addition and subtraction word problems. Introduce students to the word problems that have an unknown quantity embedded in the question.	Photograph or photocopy the completed Think Board. Annotate comments made by the student that demonstrate their understanding of the connections between the different ways of representing the problem. Check to see if students select the correct operation, select a suitable representation, and correctly represent the number sentence.	Ask students to solve questions from NAPLAN while using the Think Board.		• Think Board • Concrete Materials – counters, unifix, bundle sticks • Whiteboard pens • Word problems – unknown quantity embedded (Dark Blue) • Set of Think Board Cards • Early Years FISH Kit
TOPIC	CONTENT DESCRIPTOR	KEY IDEA	Pre-ASSESS	ASSESSMENT	INVESTIGATION	STUDENT JOURNAL	RESOURCES
2.3.2 Number Sequences 2	ACMNA026 Investigate number sequences, initially those increasing and decreasing	Students will practice skip counting in 2s, 3s, 5s and 10s from any number as a starting point using a hundreds board. Proficiency Strand:	Patterns on a Hundreds Board. The following strategy is a mental routine designed by Ann and Johnny Baker (2006). This process consists of Closed, Open, and Flip questions. Give each student a 100s	Fill in the missing numbers in the pattern http://www.semteacher.org/Worksheet/21/NumberLines.xhtml Print and laminate a series of skip counting patterns with numbers missing from the Senteacher website. Provide washable markers and ask students to figure	Calculators: With the use of a calculator ask students to find the counting pattern for the 20s, 50s and 100s. Discuss the similarities and		• 100s board • Mini whiteboard • Whiteboard markers

by twos, threes, fives and ten from any starting point, then moving to other sequences. **ACMMNA035** Describe patterns with numbers and identify missing elements.	**Fluency – counting numbers in sequences readily Understanding – connecting number calculations with counting sequences.**	**board and washable pen. Ask the following questions, and observe student responses. Scaffold the responses to assist students in finding the patterns in number sequences.**	**our the skip pattern and fill in the missing numbers. Students should be able to fill in the missing numbers, as well as describe the pattern, for example: this is counting in 4s.** **Achievement Standard: Recognise increasing and decreasing number sequences involving 2s, 3s, 5s.**	**differences between the 2s, 5s, and 10s. Source: Department of Education, Queensland. 1991. Years 1 to 10 Mathematics Sourcebook: Activities for teaching mathematics in Year 3. Department of Education: Qld p40.**		

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2.3.3 Place Value 3	**ACMNA028** Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting.	**Students will partition numbers into hundreds, tens and ones, and regroup collections as necessary as a quantity is added.** **Proficiency Strand: Understanding- Partitioning and combining numbers flexibly.**	**Place Value Chart Write hundreds, tens and ones on the columns of the show-me frame place value chart. Write a 3-digit number on the board, for example 19 Ask the students to represent the number using tiny hundreds, tens and ones on top of the frame. Place the corresponding place value arrow beneath the frame.**	**Achievement Standard – count to and from 1000.** **Say a three-digit number and ask students to represent this number using place value arrows. Students record this number using hundreds, tens and ones, expanded notation and numeral.**	**Select a three-digit number. Write clues for it and then create a WANTED number poster. Source: Baker, J. & Baker, A. 2006. Natural Maths Strategies Book 2. Blake Education: Clayton. P 69**		• **Tiny ones, tens and hundreds** • **Place value arrows** • **Mini-whiteboard** • **Digits** • **Show me pocket frame** • **Place Value dice – 100s, 10s,1s** • **FISH Kit**

TOPIC	CONTENT DESCRIPTOR	KEY IDEA	Pre-ASSESS	ASSESSMENT	INVESTIGATION	STUDENT JOURNAL	RESOURCES
2.3.4 Multiplication - Doubling	**ACMNA031** Recognise and represent multiplication as			Achievement Standard : Represent multiplication and division by grouping into sets. Use a Target game to assess students ability to work forwards and backwards with doubling by	**Give students 5 bowls. Ask students to place one counter in each bowl and record this**		Mini Whiteboard • Whiteboard pens • Counters

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				filling in the spaces. http://www.wmnet.org.uk/resources/gordon/Dart%20Board%20-%20doubles%20&%20halves.swf Cut squares of paper in half to create triangles. Write the answer at the top of the triangle and the number that you are doubling in each of bottom corner. Show students only the bottom two numbers and ask them to double, reveal the top of the triangle for the answer.	**multiplication fact 5 x 1 = 5. Ask students to then place 2 counters in each bowl and record this multiplication fact 5 x 2 = 10. Continue until students have placed ten counters in each bowl. Ask students to explain the patter to you.**			• Dominoes • Doubles Poster • FISH Kit

TOPIC	**CONTENT DESCRIPTOR**	**KEY IDEA**	**Pre-ASSESS**	**ASSESSMENT**	**INVESTIGATION**	**STUDENT JOURNAL**	**RESOURCES**
2.3.5 Multiplication - Arrays	**ACMNA031 Recognise and represent multiplication as repeated addition, groups and arrays.**	**Students will understand the commutative property of multiplication using an array model.** **Proficiency Strand: Understanding – identifying and describing the relationship between addition and subtraction and multiplication and division. Understanding – Connecting number calculations with counting sequences. Reasoning – using known facts to**	**Activity Process** – Rows Give each student 12 counters. Ask students to arrange counters into equal rows. Ask students: "How many different ways can you arrange counters into equal rows?" Allow students time to record and share their answers. Repeat with a larger or smaller collection of objects. **Activity Process** – Turnarounds Place and array on a felt square e.g. 4 rows of 2. Use the large rubber bands to highlight the rows. Write: 4 rows of 2 or 4 by 2 = 8. Remove the bands and turn the felt square 90degrees to see the turnaround. 2 rows	**Observe students when playing the *Match Me* game. Note their ability to find the matching cards and give an answer to the algorithm.** **Achievement Standard – Represent multiplication and division by grouping into sets.**			**Counters Felt Squares Large rubber bands Rods Calculator FISH Kit**

derive strategies for unfamiliar calculations. Reasoning – Comparing and contrasting related models of operations.	of 4 Use the bands to highlight the grouping. Write: 2 rows of 4 or 2 by 4 = 8. Count to make sure this is true. Have each student check the results on a calculator. Give each student an +array to make with counter on the felt square. Turn the felt square to see the turnaround – write them down as before. Ask each student to find someone with a pattern that is matching the turn-around. Use the equal sign. Check the results using rods. Photograph the turn around to make a display in the classroom. Use calculators to see if the same rule applies for 3 digit numbers. http://k6.boardofstudies.nsw.edu.au/files/maths/maths_k6_ws.pdf p21		

TOPIC	CONTENT DESCRIPTOR	KEY IDEA	Pre-ASSESS	ASSESSMENT	INVESTIGATION	STUDENT JOURNAL	RESOURCES
2.3.6 Fractions - Collections	**ACMNA033 Recognise and interpret common uses of halves, quarters and eighths of shapes and collections.**	**Students will explore halves, quarters and eighths using collections, comparing number of parts to the size of a fraction.**	**Activity Process – Collections – half.** 1. Provide a pile of 20 counters and 2 grouping circles. 2. Ask students to count the counters. 3. Ask students: *How would we work out how many is half of these counters?* 4. Model with the students	**Provide students with a collection of an even number of counters. Ask students to split the counters in half, quarters or eighths.** **Achievement Standard: Divide collections and shapes into halves, quarters and eighths.**	**Ask students inquiry based questions such as: If Joe received ¼ of the lollies and he was given six. How many lollies would there have been altogether? Or Sam had half of the toy cars. He had 5**		• **Counters** • **Grouping circles** • **Plates**

			the dividing of counters into two grouping circle, thus making Half. 5. Record the fraction in written form, explaining where the numbers have come from and if we add the two halves back together they would equal the beginning number. 6. Repeat with different numbers of counters.		cars. How many cars altogether? Allow students to use hands on materials to solve problems.		
TOPIC	**CONTENT DESCRIPTOR**	**KEY IDEA**	**Pre-ASSESS**	**ASSESSMENT**	**INVESTIGATION**	**STUDENT JOURNAL**	**RESOURCES**
2.3.7 Number Patterns 2	**ACMNA035 Describe patterns with numbers and identify missing elements. Proficiency Strand – Understanding – connecting number calculations with counting sequences. Proficiency Strand: Understanding – connecting number calculations with counting**	**Students will copy, continue, create and describe patterns with numbers.**	**Activity Process – Explore Patterns on Hundreds Board.** 1. **Ask students to make a yellow, yellow, red patterns on the 1-100 hundreds board.** 2. **Remove all the red counters, revealing skip counting in threes.** 3. **Discuss the pattern observed, for example: Diagonal patterns, the digits add up to 3, 6 or 9.** 4. **Discuss the rule that has been used to create the number pattern – add 3.** 5. **Repeat for skip counting in 2s and 4s; 5s – observing the pattern of the**	**Students complete a number pattern on the Number Pattern Base Board – given a rule and a starting number.** ***Students identify the rule – given a completed number pattern.** ***Students identify missing elements of a number pattern – given the rule and missing numbers in the pattern.** **Achievement Standard – Identify the missing element in a number sequence.**	**http://www.mathwire.com/algebra/growing patterns.html** **Mathswire website provides growing patterns as introduction to algebraic principles. Students should draw and/or describe the next couple of stages in the pattern and create an input/output table to describe the relationship between the stage and the number of blocks used. Students should be challenged to write a rule in words and more capable students should be**		**Double sided counters 1-100 Hundreds board (A3) Number Pattern Base Board Calculator Whiteboard Makers**

						STUDENT	
			last digits; Repeat for 10s observing the pattern created – what is changing?(the first digit). What is staying the same? (the last digit). 6.		challenged to write a general mathematical rule that would calculate the number of blocks needed for any given stage.		

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2.3.8 3D Objects	ACMMG043 Describe the features of three dimensional objects. Proficiency Strand: Problem Solving – Making models	Students will describe the features of three-dimensional objects, draw them and use materials to make models of these.	Activity Process – Sorting and Constructing 3D Objects. 1. Hold up a cube and review the properties. Use the terms 'faces', 'edges' and 'corners'/'vertices'. 2. Hold up a rectangular prism. Compare and contrast the cube and the rectangular prism. Ask: What is the same about these two objects (Both have 6 faces, 12 edges and 8 corners/vertices) What is different about these objects? (lengths of edges). 3. Give each pair of students two 3D objects (e.g. a pyramid and a cone) to discuss similarities and	Observe the students as they discuss the properties of shapes in activity process A and B. Display the 3D objects: Sphere, cube, prism, cylinder, cone; pyramid. Select a shape and ask the students to name the object and describe two properties, for example: It's got a circle shaped based and one edge. It's a cone. This could be done as a transitional activity.	Boxes: Provide each student with a sheet of coloured card. Ask students to create a container without a lid that is suitable for carrying 1 cup of sand. Source: First Steps in Mathematics – Space 2009. Rigby: Port Melbourne pg65.		3D Objects: Sphere, cube, prism, cylinder, cone. Mystery box – Cardboard box about 25x25x35cm with a lid. Cut holes in each side (leaving a flap) as in the diagram Straws, string, craft paper and sticky tape: to construct models of 3D objects.

| | | | differences. Ask students to record what is the same and what is different.
4. Ask students to have a go at constructing the objects using straws, string, paper and sticky tape.
5. Discuss the properties in the whole group- display the properties and the models. | | | | |

TOPIC	CONTENT DESCRIPTOR	KEY IDEA	Pre-ASSESS	ASSESSMENT	INVESTIGATION	STUDENT JOURNAL	RESOURCES
2.3.9 Measure ment 2	ACMMG037 Compare and order several shapes and objects based on length, area, volume and capacity using appropriate uniform informal units. Proficiency Strand: Fluency – using units iteratively (repeatedly)	Students will measure, record and compare volume and capacity using a variety of uniform informal objects, discussing and sharing their findings.	Activity Process – Choosing a unit of measurement. 1. Gather materials: A container, water, sand, marbles, unifix. Explain to student that you want to find the best way to measure the capacity of a container (how much it holds). 2. Fill one container with the blocks or marbles. Ask: Is the container full? Are there any spaces? How can we prove that there are spaces? Suggest adding	Observe students as they participate in the variation and extension activities – Comparing Containers. Ask students to journal their understandings about measurement from this activity. Note students' understanding of • Uniform units of measurement • Appropriate materials for measurement of capacity • Using the same unit of measure to make comparisons • Ordering containers according to their capacity.	I filled a container with 20 spoonfuls of rice. What might the container that I used look like? Do student look for a range of container and do their estimate improve as they continue to look? As an extension for this activity, ask students to make a container our of card that will hold the 20 spoonfuls of rice.		Assortment of containers in varying sizes and shapes: ice-cream bucket, teapot, water bottle, baking tray, jugs, ice cube trays and margarine containers. Coloured water Pebbles or marbles Unifix blocks Sand Measuring cup, egg cup medicine cup, tablespoon.

			water to prove this.
to compare measurement.			3. Now fill the container with water. Ask: Is the container full? Are there any spaces? Repeat with sand.
			4. Discuss the most appropriate materials to use for measurement. Discuss the advantages and disadvantages of each material, for example:
			The unifix blocks leave many gaps.
			The marbles are heavy and leave less gaps than the unifix.
			The sand is messy but fills the whole container.
			The water is easy to use and fills the whole container.
			5. Repeat the activity using a square container.
			6. Measure the capacity using marbles and cubes.
			7. Draw conclusions about the most appropriate material to use to measure capacity.

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2.3.10	ACMMG045	Students will	Activity Process – Flip,	Ask students to select a pattern	In small groups ask		Pattern blocks

Turns	Identify and describe half and quarter turns. **Proficiency Strand –** Matching transformations with their original shape.	identify transformations of shapes as flips, slides or turns; and experiment with these transformations to establish that flips, slides and turns do not alter the shape's size or features.	Slide, Turn – Physical. 1. Ask students what they know about flip, slides and turns. 2. Discuss class answers and ask students to demonstrate a flip, slide and turn with a book. 3. Now ask students to lie on the ground on their backs, ask them to demonstrate how they would move if they were sliding. Discuss with students that when they slide their head and feet remain facing the same direction. 4. Then ask students to lie on their backs and 'flip'. Discuss with students the difference with flipping from left and right and from head to feet in regard to the direction of the heard and feet. 5. Ask students to stand and demonstrate a turn, discuss where they end up facing. Then ask students	block shape. The ask students to create a pattern for you, using the selected shape that is flip, flip, turn, flip, flip, slide, turn.	students to make a shape with their bodies on the ground. For example a 'L' shape. Take a digital photo of each students shape. Then ask students to slide, flip or turn their shape. Students then rearrange themselves into the position that their shape should be in now. Take another digital photo of the shape. Compare and contrast the two photos and discuss if the students were correct with their repositioning.		Paper Digital camera

			to lie down and turn, discuss where their feet and hear are facing after the turn.				