Mathseeds Lessons and the IB Primary Years Programme in Mathematics

PHASE 1

			Mathseeds Lesson #			Additional Mathseeds Resources	
			Knowledge and Skills	Assessment	Higher Order Thinking Skills	Fluency	Assessment
Strands	**Conceptual Understandings**	**Learning Outcomes** Learners:	**Online Lesson, Printable Resources, & Problem Solving Tasks**	**End-of-lesson Quiz**	**Critical Thinking and Problem Solving Interactives**	**Driving Tests (DT)**	**Printable Achievement Standards Assessment**
DATA HANDLING	We collect information to make sense of the world around us. Organizing objects and events helps us to solve problems. Events in daily life involve chance.	understand that sets can be organized by different attributes. sort and label real objects by attributes. describe real objects and events by attributes.	8, 23, 52, 62		6, 8, 15, 23, 27	**DT** Early Data 1, 2	**Kindergarten Data** Test 1
		represent information through pictographs and tally marks.	80		80	**DT** Early Data 3-10	**Kindergarten Data** Test 2
		discuss chance in daily events (impossible, maybe, certain).	82			**DT** Grade 1 Data 5, 7, 8, 11	
MEASUREMENT	Measurement involves comparing objects and events. Objects have attributes that can be measured using non-standard units. Events can be ordered and sequenced.	identify, compare and describe attributes of real objects, for example, longer, shorter. compare the **length** of objects using non-standard units. use non-standard units to solve problems involving length.	13, 26, 55, 84			**DT** Early Measurement 2, 3, 5, 6, 9, 10 **DT** Grade 1 Measurement 2, 4, 13, 14	**Kindergarten Measurement** Tests 1-3 **Grade 2 Measurement: Length** Tests 1-5
		identify, compare and describe attributes of real objects, for example, heavier. compare the **mass** of objects using non-standard units. use non-standard units to solve problems involving mass.	29, 73, 135			**DT** Early Measurement 7, 8, 11, 12 **DT** Grade 2 Measurement 17, 18	**Kindergarten Measurement** Test 4
		identify, compare and describe attributes of real objects, for example, empty, full. compare the **capacity** of objects using non-standard units. use non-standard units to solve problems involving capacity.	38, 89			**DT** Early Measurement 15, 16 **DT** Grade 1 Measurement 11, 17-19	**Kindergarten Measurement** Test 5
		identify, describe and sequence events in their daily routine, for example, before, after, bedtime, storytime, today, tomorrow.	39, 42			**DT** Early Measurement 1, 4, 13, 14, 17-19	
SHAPE AND SPACE	Shapes can be described and organized according to their properties. Objects in our immediate environment have a position in space that can be described according to a point of reference.	understand that 2D and 3D shapes have characteristics that can be described and compared.	4, 6, 8, 9, 15, 23, 35, 44		6, 15, 23	**DT** Early Geometry 1-8, 15-18, 21-23	**Kindergarten Geometry** Tests 1-3
		describe position and direction, for example, inside, outside, above, below, next to, behind, in front of, up, down.	55, 57			**DT** Early Geometry 9-11, 13, 14	**Kindergarten Geometry** Test 5
PATTERN AND FUNCTION	Patterns and sequences occur in everyday situations. Patterns repeat and grow.	understand that patterns can be found in everyday situations, for example, sounds, actions, objects, nature. describe patterns in various ways, for example, using words, drawings, symbols, materials, actions, numbers. extend and create patterns.	8, 27, 37		6, 15, 23, 27, 31, 37, 38, 40, 46, 52, 57, 62, 63, 72, 78, 82, 87, 93, 94, 102, 153	**DT** Early Patterns 1-9	
NUMBER	Numbers are a naming system. Numbers can be used in many ways for different purposes in the real world. Numbers are connected to each other through a variety of relationships. Making connections between our experiences with number can help us to develop number sense.	understand one-to-one correspondence. count to determine the number of objects in a set. understand that, for a set of objects, the number name of the last object counted describes the quantity of the whole set. connect number names and numerals to the quantities they represent. use number words and numerals to represent quantities in real-life situations. understand conservation of number. understand the relative magnitude of whole numbers. recognize groups of zero to five objects without counting (subitizing).	1, 2, 3, 5, 7, 10, 11, 12, 14, 16, 17, 18, 19, 20, 21, 25, 28, 31, 33, 41, 43, 45, 46, 48, 50		12, 41, 60, 67, 79, 81, 88, 95, 98	**DT** Early Number 1-7, 9-19, 21-23	**Kindergarten Number** Tests 1-3
		understand that numbers can be constructed in multiple ways, for example, by combining and partitioning.	24, 30, 32, 34, 36, 40, 47, 49		19, 30, 34, 36, 40, 43, 47, 51, 53, 56, 65, 67, 75, 76, 82, 85, 88	**DT** Early Operations 1, 2, 6, 7, 9, 13, 14, 18-20	**Kindergarten Operations** Tests 1-4
		use the language of mathematics to compare quantities, for example, more, less, first, second.	16, 18, 20, 22, 31, 50, 63			**DT** Early Number 8, 20	**Kindergarten Number** Test 4
		understand whole-part relationships. use simple fraction names in real-life situations.	61			**DT** Grade 1 Patterns and Fractions 3, 5, 6	

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PHASE 2

			Mathseeds Lesson #			Additional Mathseeds Resources	
			Knowledge and Skills	Assessment	Higher Order Thinking Skills	Fluency	Assessment
Strands	**Conceptual Understandings**	**Learning Outcomes** Learners:	**Online Lesson, Printable Resources, & Problem Solving Tasks**	**End-of-lesson Quiz**	**Critical Thinking and Problem Solving Interactives**	**Driving Tests (DT) Mental Minute (MM)**	**Printable Achievement Standards Assessment**
DATA HANDLING	Information can be expressed as organized and structured data. Objects and events can be organized in different ways. Some events in daily life are more likely to happen than others.	understand that sets can be organized by one or more attributes.	52, 62		80		
		understand that information can be collected and recorded in different ways. collect and represent data in different types of graphs, for example, tally marks, bar graphs. collect, display and interpret data for the purpose of answering questions. create a pictograph and sample bar graph of real objects and interpret data by comparing quantities (more, fewer, less than, greater than).	80, 97, 135, 143		80	**DT** Grade 1 Data 1-4, 6, 9, 10, 12-16	**Grade 1 Statistics: Data** Tests 1-5
		identify and describe chance in daily events (impossible, less likely, maybe, most likely, certain).	82, 107			**DT** Grade 2 Data 2, 3, 6	
MEASUREMENT	Standard units allow us to have a common language to identify, compare, order and sequence objects and events. We use tools to measure the attributes of objects and events. Estimation allows us to measure with different levels of accuracy.	understand the use of standard units to measure length. understand that tools can be used to measure. estimate and measure objects using standard units. use standard units of measurement to solve problems.	104, 126, 141, 143			**DT** Grade 2 Measurement 9, 11, 13, 15, 19, 21-24	**Grade 2 Measurement: Length** Tests 2-8
		understand the use of standard units to measure mass. understand that tools can be used to measure. estimate and measure objects using standard units. use standard units of measurement to solve problems.	172				
		understand the use of standard units to measure money. use standard units of measurement to solve problems.	64, 83, 92, 125, 147, 159		83, 124, 125, 128, 131, 134, 139, 144, 146, 147, 148, 150, 159, 163, 170, 183, 188	**DT** Grade 1 Measurement 3, 5-7, 12 **DT** Grade 2 Measurement 12	**Kindergarten Number** Test 5 **Grade 1 Number and Algebra: Fractions and Money** Tests 3-7 **Grade 2 Number and Algebra: Fractions and Money** Tests 4-7
		estimate and measure objects using standard units of measurement: capacity. use standard units of measurement to solve problems.	154			**DT** Grade 2 Measurement 6	
		understand that calendars can be used to determine the date, and to identify and sequence days of the week and months of the year.	109		109	**DT** Grade 2 Measurement 1-4, 16	
		understand that time is measured using universal units of measure, for example, years, months, days, hours, minutes and seconds. estimate and compare lengths of time: second, minute, hour, day, week and month. use measures of time to assist with problem solving.	127, 162			**DT** Grade 1 Measurement 16 **DT** Grade 2 Measurement 5, 14	**Grade 1 Measurement: Time** Test 5 **Grade 2 Measurement: Time** Test 7
		read and write the time to the hour, half hour and quarter hour.	54, 70, 87, 114		87	**DT** Grade 1 Measurement 1, 8-10, 15 **DT** Grade 2 Measurement 7	**Grade 1 Measurement: Time** Tests 1-4 **Grade 2 Measurement: Time** Test 1

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			Knowledge and Skills	Assessment	Higher Order Thinking Skills	Fluency	Assessment
Strands	**Conceptual Understandings**	**Learning Outcomes** Learners:	**Online Lesson, Printable Resources, & Problem Solving Tasks**	**End-of-lesson Quiz**	**Critical Thinking and Problem Solving Interactives**	**Driving Tests (DT) Mental Minute (MM)**	**Printable Achievement Standards Assessment**
SHAPE AND SPACE	Shapes are classified and named according to their properties. Some shapes are made up of parts that repeat in some way. Specific vocabulary can be used to describe an object's position in space.	sort, describe and label 2D and 3D shapes.	52, 62, 99, 169			**DT** Grade 1 Geometry 1-3, 6-8, 10, 17-19	**Grade 1 Geometry: Shape** Tests 1-6
		analyse and describe the relationships between 2D and 3D shapes.	99, 121		121, 140	**DT** Early Geometry 19, 20	
		understand that 2D and 3D shapes can be created by putting together and/or taking apart other shapes.	69		69	**DT** Early Geometry 12 **DT** Grade 1 Geometry 9, 13	**Kindergarten Geometry** Test 4 **Grade 1 Geometry: Shape** Test 7
		create and describe symmetrical and tessellating patterns. identify lines of reflective symmetry. recognize and explain simple symmetrical designs in the environment. apply knowledge of symmetry to problem-solving situations.	102, 152		102, 104, 106, 108, 115, 119, 133, 145		
		represent ideas about the real world using geometric vocabulary and symbols, for example, through oral description, drawing, modelling, labelling.	141		102		
		interpret, create and use simple directions, describing paths, regions, positions and boundaries of their immediate environment.	57, 78, 94			**DT** Grade 1 Geometry 4, 5, 11, 12, 14-16	
PATTERN AND FUNCTION	Whole numbers exhibit patterns and relationships that can be observed and described. Patterns can be represented using numbers and other symbols.	represent, describe, extend and create number patterns, for example, odd and even numbers, skip counting. use number patterns to represent and understand real-life situations.	77, 79, 90, 106, 108, 117, 166		117, 120, 132, 133, 153, 168, 187, 195	**DT** Grade 1 Patterns and Fractions 1, 2, 4, 7-10, 12	**Grade 1 Number and Algebra: Patterns** Tests 1-7 **Grade 2 Number and Algebra: Number Patterns** Tests 1-7
		understand the inverse relationship between addition and subtraction. understand the associative and commutative properties of addition. use the properties and relationships of addition and subtraction to solve problems.	93, 131, 142, 183		93	**DT** Grade 1 Operations 2, 6, 16, 18 **DT** Grade 2 Operations 20, 26	**Grade 1 Number and Algebra: Operations** Test 5
NUMBER	The base 10 place value system is used to represent numbers and number relationships. Fractions are ways of representing whole-part relationships. The operations of addition, subtraction, multiplication and division are related to each other and are used to process information to solve problems. Number operations can be modelled in a variety of ways. There are many mental methods that can be applied for exact and approximate computations.	model numbers to hundreds or beyond using the base 10 place value system. read, write, compare and order cardinal numbers. use whole numbers up to hundreds or beyond in real-life situations.	56, 60, 67, 75, 81, 86, 88, 129		60, 101, 105, 106	**DT** Grade 1 Number 1-24 **DT** Grade 2 Number 1-24	**Grade 1 Number and Algebra: Whole Numbers** Tests 1-9 **Grade 1 Number and Algebra: Place Value** Tests 1-6
		read, write, compare and order ordinal numbers.	63			**DT** Early Number 24, 25	
		use the language of addition and subtraction, for example, add, take away, plus, minus, sum, difference. model addition and subtraction of whole numbers.	51, 53		65, 68	**DT** Early Operations 1-7, 9-20, 22-25 **DT** Grade 1 Operations 1-5, 7-12 **DT** Grade 2 Operations 1, 4	**Grade 1 Number and Algebra: Operations** Tests 1-4
		develop strategies for memorizing addition and subtraction number facts. use fast recall of addition and subtraction number facts in real-life situations.	72, 91, 93		91, 142	**DT** Grade 1 Operations 6, 16, 18 **DT** Grade 2 Operations 2, 5, 27, 28 **MM** Addition Sprints **MM** Subtraction Sprints	**Grade 2 Number and Algebra: Addition and Subtraction** Tests 1,6
		use mental and written strategies for addition and subtraction of two- digit numbers or beyond in real-life situations.	58, 65, 68, 76, 85, 88, 95, 96, 98, 100, 103, 110, 118, 120, 124, 128, 134, 144, 146, 148, 150, 170, 173, 178		88, 95, 96, 100, 105, 110, 113, 118, 120, 124, 125, 128, 130, 131, 134, 135, 137, 139, 140, 141, 143, 144, 146, 147, 149, 150, 154	**DT** Grade 1 Operations 13-15, 17, 19, 20 **DT** Grade 2 Operations 7, 9, 13-18, 21-25	**Grade 1 Number and Algebra: Operations** Test 6 **Grade 2 Number and Algebra: Addition and Subtraction** Tests 2-5
		understand situations that involve multiplication and division.	71, 74		71, 74, 118, 124, 134, 137, 139, 143, 148, 149	**DT** Early Operations 8, 21 **DT** Grade 2 Operations 6, 8, 10-12, 19	
		select an appropriate method for solving a problem, for example, mental estimation, mental or written strategies, or by using a calculator.	131, 147				
		model simple fraction relationships.	61, 66, 132			**DT** Grade 1 Patterns and Fractions 11, 13, 14	**Grade 1 Number and Algebra: Fractions and Money** Tests 1 & 2 **Grade 2 Number and Algebra: Fractions and Money** Tests 1-3
		model addition and subtraction of fractions with the same denominator. use fractions in real-life situations.	191		175, 180, 191, 197		

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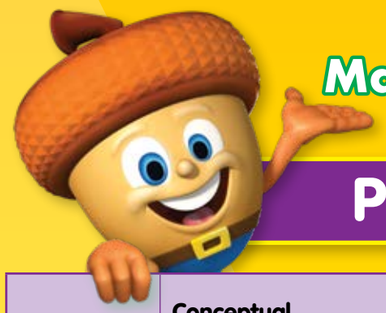
			Knowledge and Skills	Assessment	Higher Order Thinking Skills	Fluency	Assessment
Strands	**Conceptual Understandings**	**Learning Outcomes** Learners:	**Online Lesson, Printable Resources, & Problem Solving Tasks**	**End-of-lesson Quiz**	**Critical Thinking and Problem Solving Interactives**	**Driving Tests (DT) Mental Minute (MM)**	**Printable Achievement Standards Assessment**
DATA HANDLING	Data can be collected, organized, displayed and analysed in different ways. Different graph forms highlight different aspects of data more efficiently. Probability can be based on experimental events in daily life. Probability can be expressed in numerical notations.	collect, display and interpret data using simple graphs, for example, bar graphs, line graphs.	143			**DT** Grade 2 Data 4, 5	**Grade 2 Statistics: Data** Tests 1-5
		identify, read and interpret scale on graphs.	174, 187, 198				
		design a survey and systematically collect, organize and display data in pictographs and bar graphs. select appropriate graph form(s) to display data.	143, 174, 187, 198			**DT** Grade 2 Data 7-14	
		understand that probability is based on experimental events. use probability to determine mathematically fair and unfair games and to explain possible outcomes	167				
MEASUREMENT	Objects and events have attributes that can be measured using appropriate tools. Relationships exist between standard units that measure the same attributes.	estimate and measure using standard units of measurement: **perimeter**. use standard units of measurement to solve problems.	192				
		estimate and measure using standard units of measurement: **area**. use standard units of measurement to solve problems.	59, 112, 149, 157, 193, 200		59		
		estimate and measure using standard units of measurement: **volume**. select appropriate tools and units of measurement. use standard units of measurement to solve problems.	116				
		describe measures that fall between numbers on a scale, for example, between 4 cm and 5 cm. (**length**) understand relationships between units, for example, metres, centimetres and millimetres. select appropriate tools and units of measurement.	182, 198				
		read and write digital and analogue time on 12-hour and 24-hour clocks.	123, 162, 185			**DT** Grade 2 Measurement 10, 20	**Grade 2 Measurement: Time** Tests 2, 4, 5, 6
		use timelines in units of inquiry and other real-life situations.	179, 189		179, 181, 185, 189, 200		**Grade 2 Measurement: Time** Test 3
		understand an angle as a measure of rotation.	177				
SHAPE AND SPACE	Changing the position of a shape does not alter its properties. Shapes can be transformed in different ways. Geometric shapes and vocabulary are useful for representing and describing objects and events in real-world situations.	analyse and describe 2D and 3D shapes using geometrical vocabulary.	119, 121, 169			**DT** Grade 2 Geometry 3-7, 10	**Grade 2 Geometry: Shape** Tests 1-5
		understand the properties of regular and irregular polygons. sort, describe and model regular and irregular polygons. identify, describe and model congruency and similarity in 2D shapes.	119, 145, 184				
		understand that lines and axes of reflective and rotational symmetry assist with the construction of shapes. recognize and explain symmetrical patterns, including tessellation, in the environment.	102, 152				
		understand an angle as a measure of rotation. analyse angles by comparing and describing rotations: whole turn; half turn; quarter turn; north, south, east and west on a compass.	102, 164				
		apply knowledge of transformations to problem-solving situations.	102		102	**DT** Grade 2 Geometry 1, 9, 11, 12	
		understand that directions for location can be represented by coordinates on a grid. locate features on a grid using coordinates.	164			**DT** Grade 2 Geometry 2, 8, 13	
		understand that visualization of shape and space is a strategy for solving problems. describe and/or represent mental images of objects, patterns, and paths.	130, 155, 164				



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			Knowledge and Skills	**Assessment**	**Higher Order Thinking Skills**	**Fluency**	**Assessment**
Strands	**Conceptual Understandings**	**Learning Outcomes** Learners:	**Online Lesson, Printable Resources, & Problem Solving Tasks**	**End-of-lesson Quiz**	**Critical Thinking and Problem Solving Interactives**	**Driving Tests (DT) Mental Minute (MM)**	**Printable Achievement Standards Assessment**
PATTERN AND FUNCTION	Functions are relationships or rules that uniquely associate members of one set with members of another set. By analysing patterns and identifying rules for patterns it is possible to make predictions.	describe the rule for a pattern in a variety of ways. represent rules for patterns using words, symbols and tables. select appropriate methods for representing patterns, for example using words, symbols and tables. use number patterns to make predictions and solve problems.	133, 137, 153, 156, 158		170, 173, 195	**DT** Grade 2 Patterns and Fractions 1-4, 6-10, 13	
		identify a sequence of operations relating one set of numbers to another set.	166, 195				
		understand that multiplication is repeated addition and that division is repeated subtraction. understand the inverse relationship between multiplication and division. understand the associative and commutative properties of multiplication.	111, 113, 115, 136, 165, 171, 176, 181				
		use the properties and relationships of the four operations to solve problems.	163, 188		183, 188, 193, 194, 195, 199		
NUMBER	The base 10 place value system can be extended to represent magnitude. Fractions and decimals are ways of representing whole-part relationships. The operations of addition, subtraction, multiplication and division are related to each other and are used to process information to solve problems. Even complex operations can be modelled in a variety of ways, for example, an algorithm is a way to represent an operation.	model numbers to thousands or beyond using the base 10 place value system. read, write, compare and order whole numbers up to thousands or beyond. use whole numbers up to thousands or beyond in real-life situations.	101, 105, 106, 122, 151, 156, 161, 194		105, 151, 153, 156, 161, 194, 199		**Grade 2 Number and Algebra: Numbers to 1000** Tests 1-8
		use the language of multiplication and division, for example, factor, multiple, product, quotient. model multiplication and division of whole numbers. use mental and written strategies for multiplication and division in real-life situations.	111, 113, 115, 130, 136, 155, 165, 168, 186, 190, 193, 196		77, 79, 113, 130, 136, 153, 168, 186, 188, 193, 199		**Grade 2 Number and Algebra: Equal Groups** Tests 1-5
		develop strategies for memorizing addition, subtraction, multiplication and division number facts. use fast recall of multiplication and division number facts in real-life situations.	158, 168, 171, 176, 181, 190, 199		159, 163, 168, 170, 172, 175, 176, 178, 180, 181, 182, 183, 186, 188, 191, 193, 195, 196, 197	**MM** Addition Sprints **MM** Subtraction Sprints **MM** Multiplication Sprints **MM** Division Sprints	**Grade 2 Number and Algebra: Addition and Subtraction** Tests 7-9
		use the language of fractions, for example, numerator, denominator.	138				
		read, write, compare and order fractions to hundredths or beyond.	160, 175, 191, 197			**DT** Grade 2 Patterns and Fractions 5, 11, 12, 14-17	
		model, read and write equivalent fractions.	180, 191				
		select an efficient method for solving a problem, for example, mental estimation, mental or written strategies, or by using a calculator.	137, 139, 141, 168, 188