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Continuous learning strands Maths

A REVISION AND ACTUALISATION OF THE LEARNING STRANDS MATHS 2016

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Content

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Introduction and accountability

Background

In 2016, on behalf of the Ministry of Education, Culture and Science (OCW), the National Center for Curriculum Development (SLO) developed learning strands Maths for primary education and form 1 and 2 of secondary education on St. Eustatius. The reason for the development of the learning strands was the need to improve the level of competence in Maths. The learning strands where based on the Dutch core objectives and the existing learning strands Maths for primary education in the Netherlands.

In 2020 OCW commissioned an evaluation of the learning strands after the schools on St. Eustatius and Saba (using the learning strands as well) had indicated that they considered this desirable.

School-based curriculum development

In 2021 the evaluation and revision of the learning strands for St. Eustatius and Saba started. A working group was set up for each island with representation of all schools, with a spread of the teachers over the different years. Prior to the three meetings that took place in 2021-2022, the schools and working group members completed surveys in which they were questioned about their experiences with the learning strands and wishes for revision. Based on this and on the preparation assignments, proposals for revision were done during the working group meetings and discussed for the various groups and domains of the learning strands Maths.

Why a learning strand?

A learning strand is a schematically represented structure of (intermediate) objectives and content that lead to an end objective. It covers successive school years and school types and that is why we speak of a 'continuous' learning strand: from pre-school to lower secondary education. A learning strand has several functions. In the context of education on Saba and St Eustatius, an important function is that the curriculum is recorded. This is an important counterbalance to the rapid personnel changes in schools on Statia and Saba, causing a lack of continuity, since the arrival of a new teacher can lead to a different educational offer. Because a learning strand clearly describes what a student needs to know at a certain time, it also serves to avoid repetitions or gaps in the educational offer. It can also be used to evaluate the educational offer and to make choices in this regard. In addition, a learning strand can serve

as a basis for developing own teaching materials and as a basis for the development of (standardised) (follow-up) tests, because the tests can be tailored to the content and levels described in the learning strand. Finally, a learning strand is a realisation of legal frameworks. As such, the curriculum guarantees that the educational offer for Maths meets legal standards and requirements and is 'up to date'.

Revision of the learning strand Maths

The revisions are based on the experiences and judgements of the working group members with the learning strands (we used questionnaires, preparations of working group meetings and discussions during these meetings), the method Math in Focus and on the insights of the curriculum experts about the appropriateness of the content of the cells. The following factors have been taken into account: the connection with the educational offer based on the method, the connection with the contents of the cells in the preceding and subsequent years, the current and desired levels of the pupils, the relevance for the Caribbean context in general and for the school-specific context of St. Eustatius and Saba.

The revision relates to the form and content of the learning strands. The most important revisions are explained. The form of the learning strand has been adjusted with the addition of an arrow that runs from left to right on the horizontal axis above the lines that indicate the grades. This emphasizes that there is a development in ascent of levels and that the dividing lines between the different levels are not absolute. On Statia teachers use the term 'group', on Saba they use the term 'grade'. During the meeting in March, it was decided that both will be used in the document. Finally within a cell every new phrase is placed on a new line.

Most revisions relate to the content of the learning strands. Content in the cells has been changed in the following ways: contents have been left out, replaced to another group or cells, reworded, and things are added. It goes too far to describe all these adjustments. Some concrete examples of these categories of revision of the content are listed below:

Left out:
Some cells in a learning strand are empty. For example, 'ratio, proportion and per cent' and some topics within the domain of geometry, both for the lower grades. For these lower grades there is no content for these specific topics. We have left the names of this topics on purpose, so that it is known that these exist and that they will start at a later time.

A lot of examples, given by some teachers in the preparatory assignments, were left out in the final document.

Replaced to other groups:
Much of the content in group 8/grade 6 was the same as in group 7/grade 5. These duplicates have been removed and replaced with new, in-depth content for group 8/grade 6.

There was content given in the cell 'congruence and symmetry' for group 2. This is moved to group 5/grade 3 because of the difficulty of the topic.

Replaced to cells connected to other intermediate objectives:
'Add and subtract whole number to 1000' was mistakenly included in group 4/grade 2 instead of group 5/grade 3. This was moved to group 5/grade 3 and 'add and subtract whole numbers to 100' was added for group 4/grade 2.

Reworded:
The last part of the learning strands, for all groups, describes the topics 'communication', 'connections' and 'representation'. These are all cross-domain. Therefore, in some places a general description has been chosen that applies to more groups/grades.

Additions:
Content is formulated for preschool. This has been presented to preschool teachers and adjusted where it appeared necessary.

A lot of content has been added to form 1 and form 2. Most cells were empty before. If cells in a learning strand were empty (for example in the domain 'geometry', topic 'two dimensional shapes' and the domain 'measurement'), it was examined what suitable learning content would be to complete the learning strand.

Reading guide
The objectives of the different domains and the topics within them are described for the different groups/grades, from preschool to form 1-2. The intermediate objectives are displayed per domain and topic on the vertical axis. The elaboration of the objectives are shown on the horizontal axis.

The objectives are worked out for individual groups/grades. The content in the cells indicate what students should achieve on average in that grade/group/grade.

Finally, we would like to thank all those who were involved in the revision of the learning strands. In particular, we would like to thank the members of the Maths working groups on St. Eustatius and Saba who have invested a lot of time and energy in this revision. They have ensured that this learning strands is based on and gives further direction to the development of the educational offer for Maths on St. Eustatius and Saba.

Learning strands Maths, from Pre School to Group 4 – grade 2

			Numbers and Operations		

	PreSchool	Group 1	Group 2	Group 3 - grade 1	Group 4 – grade 2
Sets and Numbers Number representation Count Compare and Order Place value	Count numbers in a familiar, daily situation Basic understanding of numbers and counting Develop number sense through games and everyday activities	Count, compare and order numbers up to 10 Write the symbols up to 10 Number recognition, write numbers to 10 Pair numbers to 10	Count, compare and order numbers up to 20 Count in 2s and 5s up to 20 Count on and back to 20 Use concrete models to create a set with given number of objects up to 20 Use cardinal and ordinal numbers (first, second, third and last) Compare and order using the terms fewer, more and less Use terms and, plus, is	Count, compare and order numbers from 20 up to 100 Read and write up to 100 To use the symbols +, = to write number sentences to show combinations to a total of 20 Sets- identify sets Order sets according to size Group objects and numbers up to 100 in tens and ones Recognize the sequence of numbers 11-15, 16-20 and complete sequences to 100 Use terms same, more, fewer, greater than, less than, equal to, greatest and least Recognize number symbols (numerals) to 100 Match picture number with objects to 100 Use concrete and pictorial models to create a set with a given number of objects 100 Use place value models and place value charts to represent numbers to 100 Use number bonds to	Count, compare and order numbers from 100 up to 1000 (using the terms same, more, fewer, greater than, less than, equal to, greatest and least) Count forward in 10's and 100's to one thousand Count backwards in 10's and 100's from 1000 to 10 Use concrete and pictorial models to create a set with a given number of objects up to 1000 Group objects and numbers up to 1000 and hundreds and tens Represent numbers to 1000 on a number line Use place value models and place value charts to represent numbers to 1000 Express numbers to 1000 in standard and word forms

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				represent number combinations Use ordinal numbers up to 10th	

Numbers and Operations (continuation)					

	PreSchool	**Group 1**	**Group 2**	**Group 3 - grade 1**	**Group 4 – grade 2**
Fraction concepts	Whole; use manipulatives Use manipulative, real materials to introduce factions in a simple manner	Half/ whole; use manipulatives Introduce half, in folding papers and games Introduce fractions with everyday activities and games Use manipulative, real materials to introduce factions in a simple manner	Half – wholes-quarts; use manipulatives Arts & craft activities (e.g. folding) Introduce quart Continuation of the introduction of fractions with everyday activities and games Use manipulative, real materials to introduce factions in a simple manner	Identify wholes Identify one half of a whole Name the number of halves in wholes and write the numeral for one half (1/2) Partition shapes into two to four equal shares Describe the shares using the terms halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of Understand that dividing a shape into more equal shares makes smaller shares	Identify wholes Identify one half of a whole Name the number of halves and quarters in wholes and write the numeral for one half (1/2) and one quarter (1/4) Divide sets containing an even number of objects into halves and quarters Identify which values are more than, greater than and less than Recognize parts and whole Connect geometric concepts with unit fractions: halves, thirds, and fourths Understand the relationship between a fraction and a whole Compare and order halves, thirds, and fourths using bar models
Money	Hands-on activities that is practical and meaningful and fun Centre play (shop)	Introduce money; difference money- coins Centre play (shop)	Identify coin values (penny, nickel, dime, quarter)	Identify and relate coin values (penny, nickel, dime, quarter) Count and make coin combinations	Identify and relate coin values (penny, nickel, dime and quarter) Count and make coin combination Count and make combinations of coins to

					$1,00 using 1 cent, 5 cents, 10 cents and 50 cents
					Identify and describe coins up to 10 dollars
					Identify $1, $5, $10, and $20 bills
					Compare money amounts

Numbers and Operations (continuation)					

	PreSchool	Group 1	Group 2	Group 3 - grade 1	Group 4 – grade 2
Decimal concepts					Use the dollar sign and decimal point
Ratio, proportion and per cent					

		Operations			

		PreSchool	**Group 1**	**Group 2**	**Group 3 - grade 1**	**Group 4 – grade 2**
Whole number computation: Addition and Subtraction Whole number computation: Addition and Subtraction in real-world problems		Number awareness and recognition	Introduction of numbers to 5 problems though games using non-standard units Count back One-to-One correspondence Subitize Anchors of 5 Part + Part = Whole More than, less than, same	Addition and subtraction to 10, using non-standard units and stand units One more One less How many more? How many less? Use models, numbers, and symbols for addition and subtraction facts to 20 Number awareness and recognition One-to-One correspondence Subitize Anchors of 5 and 1 Part + Part=Whole More than, less than, same	Use +, -, and = to write number sentences for addition and subtraction stories Represent addition and subtraction stories Model addition and subtraction situations Use models, numbers, and symbols for addition and subtraction facts to 20 Use the order, grouping, and zero properties to develop addition and subtraction fact strategies Add and subtract up to 2-digit numbers with and without regrouping	Add and subtract up to 2-digit numbers with and without regrouping Formulate addition and subtraction stories Solve addition and subtraction problems using basic facts Model addition and subtraction with place value Recall addition and subtraction facts Use different methods to develop fluency in adding and subtracting multi-digit numbers Solve multi-digit addition and subtraction problems by using a bar model
Whole number computation: Multiplication and Division concepts Whole number computation: Multiplication and Division algorithms			Introduction of making groups	Practise making larger/different groups	Count by 2s, 5s, and 10s Model addition by joining sets of objects (for any sets with 10 objects /numbers when joined) Add the same number	Add the same number, multiply Represent sharing equally and making equal groups Multiply and divide with 2, 3, 4, 5 and 10 Represent multiplication as repeated addition Represent division as repeated subtraction Use the x : and = symbols to represent multiplication and division situations

					Use bar models to represent multiplication and division situations Solve multiplication and division fact problems

Operations (continuation)

	PreSchool	Group 1	Group 2	Group 3 – grade 1	Group 4 – grade 2
Fraction computation			Identify and draw whole	Identify and draw whole objects Identify objects into two equal parts, each part is called one half Name the number of halves in wholes and write the numeral for one half	Recognize the numerals for one half and one quarter Add and subtract like fractions (halves, thirds, fourths) Recognize one half of a number of objects Half of a set of 2, 4, 6, 8 and 10 objects Comparison of fractions using the symbols is less than < is greater than > is equal to =
Decimal computation				Add and subtract money	Add and subtract money
Estimation and Mental math				Use mental math strategies to add and subtract Estimate quantity by using referents	Use mental math strategies to add and subtract Estimate quantity by using referents Round to the nearest ten to estimate sums and differences.

Algebra					

	PreSchool	Group 1	Group 2	Group 3 – grade 1	Group 4 – grade 2
Patterns	Use manipulative with hands on fun activities ABAB (red, blue, red, blue) ABC (car, truck, plane, car, truck, plane)	Pattern of shapes Pattern of colour Pattern of same / alike Use manipulatives with hands on fun activities	Count by 2s and 5s Describe and extend repeating shape patterns Find missing terms in repeating patterns	Count by 2s and 5s and 10s Identify and make patterns using plane shapes (rectangles, circles, squares and triangles)	Skip count by 2s, 5s and 10s Identify a rule for sorting objects Describe a rule for sorting objects Identify, describe and extend two- and three-dimensional shapes
Properties			Identify 0 as the identity element for addition and subtraction	Use the associative and commutative properties of addition	Understand that addition and subtraction are inverse operations Apply properties of addition Use the distributive property as a multiplication strategy
Number theory			Identify odd and even numbers	Understand the relationship between the numbers in fact families	Recognize how bar models show relationships between numbers and unknown in number sentences
Functional relationships					
Expressions/Models				Use a variety of concrete, pictorial and symbolic models for addition and subtraction	Use a variety of concrete, pictorial and symbolic models for addition, subtraction, multiplication and division
Number sentences and Equations			Model addition and subtraction situations by writing addition and subtraction number sentences	Model addition and subtraction situations by writing addition and subtraction number sentences	Model multiplication and division situations by writing multiplication and division number sentences Use bar models and number sentences to represent real world problems Determine the value of missing quantities in

					number sentences
Algebra (continuation)					
	PreSchool	**Group 1**	**Group 2**	**Group 3 – grade 1**	**Group 4 – grade 2**
Equality and Inequality			Understand the difference between equality an inequality	Understand the difference between equality an inequality	Use and create models that demonstrate equality or inequality

Use < and > and = to write number sentences |

			Geometry		

	PreSchool	Group 1	Group 2	Group 3 – grade 1	Group 4 – grade 2
Size and Position	Position words/ Pre-position words top-middle- bottom in front – in the back using real life situation / and centre play Identify objects as big and small using manipulative and pictures	Big – small Big- bigger – biggest Small – smaller – smallest More – more than Less- less than Fewer – fewer than etc. Identify objects as big and small using manipulative and pictures Sort and compare objects Introduction of big and small	Understand big, middle-sized and small Describe and compare objects by position (left and right) Use positional words to describe location	Sort, compare and describe objects by size and position Arrange from biggest to smallest and smallest to biggest/tallest to shortest Describe and compare objects by position (left and right) Use positional words to describe location	Sort, compare and describe objects by size and position Arrange from biggest to smallest and smallest to biggest/tallest to shortest
Lines and Angles	Identify parts of lines and curves	Create and form lines	Identify and draw lines	Identify and draw combined lines	Identify and draw different kinds of lines: straight, curve, zigzag etc. Draw line segments Identify line segments
Expression/Models				Draw lines-identifying lines as short, long	Draw, describe, compare, classify, group Use different lines and shapes to create patterns Identify representations of lines and line segments
Two dimensional shapes	Basic flat shapes, the name of the shapes. Real world connections (objects in the classroom/ centres/ poems rhymes etc.)	Basic flat shapes How many corners/ How many sides?	Identify similarities and differences Name flat shapes that make up real-world objects Identify, describe, sort and classify two – dimensional shapes Make flat shape pictures	Sort and classify two dimensional shapes Compose and decompose two dimensional shapes Collect sort identify name discuss Big, small, bigger, smaller than Recognize and describe similarities and	Identify, describe, sort and classify two-dimensional shapes Identify parts of lines and curves Compose and decompose two dimensional shapes Develop foundations for understanding area

| | | | | differences among different plane and solid shapes in the environment

Identify and make plane and solid shapes | |

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<tr><td colspan="6" align="center">**Geometry (continuation)**</td></tr>
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	PreSchool	**Group 1**	**Group 2**	**Group 3 – grade 1**	**Group 4 – grade 2**
Three dimensional shapes			Name and sort solid shapes Understand that three-dimensional shapes are made up of two-dimensional shapes	Sort and classify three dimensional shapes Compose and decompose three dimensional shapes	Identify, name and classify three dimensional shapes Compose and decompose three dimensional shapes
Congruence and Symmetry					
Transformations					
Coordinate geometry					

	Measurement				
	PreSchool	**Group 1**	**Group 2**	**Group 3 – grade 1**	**Group 4 – grade 2**
Length and Distance	Compare length long-short	Compare and order lengths (long, short, longest, shortest) Far – near Close by – far etc.	Compare and order lengths (long, short, longest, shortest) Understand the inverse relationship between the size of a unit and the number of units	Compare lengths and heights using non-standard units Compare two lengths by comparing each with a third length (transitivity) Develop a background for measurement using non-standard units Use a start line to measure length Measure lengths, using non-standard units Explain the need for equal length units to measure	Compare and measure lengths using customary and metric units Demonstrate linear measure as an iteration of units Use rulers to measure length Measure length in meters, centimetres, feet and inches Demonstrate partitioning and transitivity in relation to length Solve problems involving estimating, measuring and computing length
Weight, Mass	Compare weights using objects (heavy-light)	Compare weight heavy-light heavier- lighter-heaviest-lightest Order objects by weights	Order objects by weights	Compare weights using non-standard units	Compare and measure weights using non-standard units Compare two masses by comparing each with a third mass (transitivity) Solve weight problems
Capacity, Volume	Introduction full- empty A little – a lot	Identify full -empty More - less	Compare capacities using non- standard units More than, less than Full, empty	Compare capacities using non- standard units More than, less than Full, empty	Compare capacities using non-standard units Measure volume (capacity) in litres Estimate and measure capacity Order containers according to capacity

		Measurement (continuation)			

	PreSchool	Group 1	Group 2	Group 3 – grade 1	Group 4 – grade 2
Time	Name and order the days of the week and the months of the year	Name and order the days of the week and the months of the year Morning time Afternoon time Night time How many days in a week/ First day of the week / Last day of the week.	Name and order the days of the week and the months of the year Morning time Afternoon time Night time 7 days in a week / 12 month in a year / 1 decade	Compare durations of events Recognize the correct way to write the date Read a calendar to identify the days of the week, months and seasons of the year Recognize the correct way to write the date Tell time to the hour and half our	Use the 24-hour clock to tell time Quarter past and quarter to the hour Use a.m. and p.m. to write time Tell time to five minutes Find elapsed time
Temperature	Relate with science concept The sun, lighted stove and refrigerator	Relate with science concept The sun, lighted stove and refrigerator	Relate with science concept The sun, lighted stove and refrigerator	Hands on activities related to Science- Carrying out experiment Use story time to introduce the concept	Hands on activities related to Science- Carrying out experiment Use story time to introduce the concept. Measure and read the temperature. Celsius and Fahrenheit
Angles					
Perimeter					
Area			Compose and decompose two dimensional shapes (foundation for understanding area)	Compose and decompose two dimensional shapes (foundation for understanding area)	Develop foundations for understanding area
Surface Area and Volume					

	Data Analysis				
	PreSchool	**Group 1**	**Group 2**	**Group 3 – grade 1**	**Group 4 – grade 2**
Classifying and Sorting	Introduce classifying and sorting items by shape, size, colour through play, poems and songs.	Classify and sort items by shape, size, colour Understand similarities and differences in objects and shapes	Classify and sort items by shape, size, colour, texture, function etc. Sort and classify data in order to make graphs	Classify and sort items by shape, size, colour, texture, function etc. Classify and sort data/items in order to make graphs Two-row picture graphs Interpret read compare Use concrete materials, make two-rows pictographs and read information from picture graphs Interpret data in picture graphs	Classify and sort data order to make graphs Collect and organize data in different ways Represent measurements and data in picture graphs, tally charts and bar graphs Interpret data in picture graphs, tally charts and bar graphs Read bar graphs with scales Solve problems involving data
Collect and organize data			Use concrete materials to make graphs Organise data for a picture graph	Use concrete materials to make graphs Organise data for a picture graph	Collect and organize data in picture graphs- bar graph – tally chart Collect and organize data in different ways
Represent data			Use concrete materials to make picture graphs	Represent measurements and data in different graphs	Represent data in picture graphs- bar graph – tally chart
Interpret/ Analyse data			Introduction of picture graphs Interpret data in picture graphs	Read, interpret and compare information from picture graph Introduce picture graph- bar graph- tally chart to collect real world data	Interpret picture graphs with scales Solve real world problems using picture graphs- bar graph – tally chart

Probability					
	PreSchool	**Group 1**	**Group 2**	**Group 3 – grade 1**	**Group 4 – grade 2**
Outcomes					
Expressing probability					

	PreSchool	Group 1	Group 2	Group 3 – grade 1	Group 4 – grade 2
Problem Solving					
Build skills through problem solving			Introduce problem solving using classroom situations /problems	Build skills in addition and subtracting through problem solving	Build skills in addition, subtraction and measurement through problem solving
Solve real-world problems			Solve real-world problems involving addition and subtraction	Solve real-world problems involving addition and subtraction	Solve real-world problems involving addition and subtraction
Use appropriate strategies and thinking skills to solve problems				Apply problem-solving strategies in Put on Your Thinking Cap and Problem Solving activities	Apply problem-solving strategies in Put on Your Thinking Cap and Problem Solving activities
Apply and explain problem solving				Solve real world problems	Apply and explain problem-solving processes in Put on Your Thinking Cap! And other activities
Explore concepts			Use models to explain reasoning	Use models to explain reasoning Explore concepts more deeply and justify reasoning in Let's Explore and Hands-On activities	Explore concepts more deeply and justify reasoning in Let's Explore and Hands-On activities Apply Thinking Skills, Put on Your Thinking Cap!, Challenging Practice, and Problem-Solving activities
Investigate mathematical ideas			Investigate ideas with two-dimensional shapes	Investigate ideas with two-dimensional shapes	Further investigate mathematical ideas by completing critical thinking skills activities

			Problem Solving (continuation)		

	PreSchool	Group 1	Group 2	Group 3 – grade 1	Group 4 – grade 2
Identify, demonstrate and explain mathematical proof			Demonstrate that only a few big things fit into small spaces and many small things fit into big spaces Describe, sort and classify two-and three-dimensional shapes Interpret data in tally charts and pictographs Identify and extend repeating shape patterns	Demonstrate that only a few big things fit into small spaces and many small things fit into big spaces Describe, sort and classify two-and three-dimensional shapes Interpret data in tally charts and pictographs Identify and extend repeating shape patterns	Explore transitivity by comparing lengths and weights of three different objects Identify and describe attributes and properties of two- and three-dimensional shapes Interpret picture graphs, tally charts and bar graphs Identify and extend growing number patterns and repeating shape patterns
Use a variety of reasoning skills		Identify similarities and differences Sort and classify using attributes	Recognise shapes from different perspectives	Sort and classify using attributes Identify similarities and differences Recognize shapes from different perspectives Use the commutative and associative properties, and 10s and 1s to solve two-digit addition and subtraction problems	Recognize shapes from different perspectives Use the commutative and associative properties, and 10s and 1s to solve two-digit addition and subtraction problems Explore the inverse relationship between addition and subtraction Identify surfaces that slide, stack and roll

Communication					

	PreSchool	Group 1	Group 2	Group 3 – grade 1	Group 4 – grade 2
Consolidate mathematical thinking	Students will express and understand mathematical thinking, and engage in mathematical activities with concrete materials.	Students will express and understand mathematical thinking, and engage in mathematical discussions using concrete materials	Students will use everyday language, language resources as necessary, appropriate mathematical terminology, a variety of representations, and mathematical conventions Consolidate thinking in independent activities	Students will solve problems that arise in mathematics and in other contexts Present mathematical thinking through Math Journal activities	Students will apply and adapt a variety of appropriate strategies to solve problems Students will monitor and reflect on the process of mathematical problem solving and share their understanding using concrete materials. Present mathematical thinking through Math Journal activities
Communicate with peers, teachers, and others Share mathematical thinking Express mathematical ideas	Students will learn math ideas and use them among in and out of the classroom Students will learn and understand the use of math language and use them during their interaction Students will share their ideas during activities Students will express mathematical ideas	Students will learn math ideas and use them among in and out of the classroom Students will learn and understand the use of math language and use them during their interaction Students will share their ideas during activities Students will express mathematical ideas	Students will build on their math skills and will share ideas and contribute to learning task in a meaningful way using correct math terms in and out of the classroom. Discuss mathematical ideas in paired and small group activities as well as activities led by the teacher. Students will share their ideas during activities and interact with others. Students will develop and apply reasoning skills and use the language of mathematics to express mathematical ideas precisely Use models and pictures as stimulus for explaining thinking	Students will build on their math skills and will share ideas and contribute to learning task in a meaningful way using correct math terms in their daily likes. Discuss mathematical ideas in Let's explore activities. Work together in pairs or group in Let's explore, games, and other activities. Students will organize and consolidate mathematical thinking though communication and communicate mathematical thinking coherently and clearly to peers, teachers, and others Share mathematical ideas	Students will build on their math skills and will share ideas and contribute to learning task in a meaningful way using correct math terms in their daily likes. Discuss mathematical ideas in Let's explore activities. Work together in pairs or group in Let's explore, games, and other activities. Students will organize and consolidate mathematical thinking though communication and communicate mathematical thinking coherently and clearly to peers, teachers, and others Share mathematical ideas

				with others during Let's explore and hands – on activities Students will develop and apply reasoning skills and use the language of mathematics to express mathematical ideas precisely Express ideas Math journal activities, using lesson vocabulary correctly	with others during Let's explore and hands – on activities Students will develop and apply reasoning skills and use the language of mathematics to express mathematical ideas precisely Express ideas Math journal activities, using lesson vocabulary correctly

Connections					
	PreSchool	**Group 1**	**Group 2**	**Group 3 – grade 1**	**Group 4 – grade 2**
Recognize connections in mathematical ideas Understand how concepts build on one another Solve real-world problems in contexts outside of mathematics	Students will use concrete materials to show relation to what they are doing	Students will use concrete materials to make connections among mathematical concepts, procedures, and representations	Students will use concrete make connections among mathematical concepts, procedures, and representations, and relate mathematical ideas to other contexts	Students will make connections among mathematical concepts, procedures, and representations, and relate mathematical ideas to other contexts (e.g., other curriculum areas, daily life, sports)	Students will make connections among mathematical concepts, procedures, and representations, and relate mathematical ideas to other contexts (e.g., other curriculum areas, daily life, sports)

Representation					
	PreSchool	Group 1	Group 2	Group 3 – grade 1	Group 4 – grade 2
Use presentations to model, organize and record Select and apply representations to model problems Interpret phenomena through representations	Students will use concrete materials to help them build mathematical concepts and use materials during play and learning interactions to answer questions and figure how things work	Students will use concrete materials to help them build mathematical concepts and use materials during play and learning interactions to solve problems and understand how things work	Students will select, concrete materials to help them solve problems and apply knowledge in everyday skills	Students will develop, select, and apply problem-solving strategies select from and different representations of mathematical ideas and apply them to solve problems	Students will develop, select, and apply problem-solving strategies select from and create a variety of representations of mathematical ideas (e.g., representations involving physical models, pictures, numbers, variables, graphs), and apply them to solve problems

Learning strands Maths, from group 5 – grade 3 to Form 1-2

Numbers and Operations

	Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 - 2
Sets and Numbers Number Representation Count Compare and Order Place Value	Count, compare and order numbers to 10.000 Count by multiples ones, tens, hundreds and thousands Use concrete and pictorial models to create a set with a given number of objects up to 10.000 Group objects and numbers up to 10.000 into thousands, hundreds, tens and ones Group objects into equal sized groups Use place value models to create equivalent representations of numbers Represent numbers to 10.000 on a number line Use > < and = to compare whole numbers Use base models and place value charts to represent numbers to 10.000 Express numbers to 10.000 in terms of place value Compose and	Count, compare and order numbers up to 100.000 Count by hundreds, thousands and ten thousands Represent numbers to 100.000 in different equivalent forms Use place value models to read, write and represent up to 100.000	Count, compare and order numbers up to 1.000.000 Count by thousands, ten thousands and hundred thousands Represent numbers to 1.000.000 in various contexts Express numbers to 1.000.000 in standard, expanded and word forms	Count, compare and order numbers up to 10.000.000 Count by hundreds thousands and millions Express numbers to 10.000.000 in various forms Explore negative numbers in context Understand place value concepts through millions	Classify types of numbers using the knowledge of set theory Distinguish between types of numbers: a. natural and whole numbers b. odd and even c. prime and composite d. whole numbers and integers Compare numbers written in the decimal system with other number systems Perform basic operations on decimals, integers, proper fractions and mixed numbers Read and write numbers in the decimal (denary) system up to seven digits

	decompose multi digit numbers (including expanded form)				
Numbers and Operations (continuation)					
	Group 5 – grade 3	**Group 6 – grade 4**	**Group 7 – grade 5**	**Group 8 – grade 6**	**Form 1 – 2**
Fraction Concepts	Connect geometric concepts with unit fractions, halves, thirds and fourths Understand the relationship between a fraction and a whole Compare and order halves, thirds and fourths using bar models	Understand the meanings and uses of fractions including fraction of a set Understand that the size of a fractional part is relative to the size of the whole Compare fractions using models and number lines Identify equivalent fractions through the use of models, multiplication, division and number lines	Recognize, write, name and illustrate mixed numbers and improper fractions Find a fraction of a set Generate equivalent fractions Convert among mixed numbers and improper fractions	Convert fractions to decimals Relate fractions and division expressions Find fractional parts of given quantities	Perform basic operations on decimals, integers, proper fractions and mixed numbers
Money	Identify $1, $5, $10 and $20 bills Count and make combinations of coins and bills Compare money amounts	Add and subtract money Solve real-world problems involving additions and subtraction of money	Add and subtract money Solve real-world problems involving additions and subtraction of money	Add and subtract money Solve real-world problems involving additions and subtraction of money	Estimate results of operations with integers, money, decimals and proper fractions Perform the four basis operations using money Convert the currencies of one country to another Solve problems involving money conversions Compare the price of items to select the best value for money Solve simple problems involving household bills Investigate the effect of conservation on utility bills

Numbers and Operations (continuation)

	Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 – 2
Decimal concepts	Use the dollar sign and decimal point	Use the dollar sign and decimal point in money amounts	Model decimals using tenths and hundredths Understand decimal notation through hundredths as an extension of the base-ten system Read and write decimals that are greater than or less than 1 Compare and order decimals Identify equivalent decimals Connect equivalent fractions and decimals	Model decimals using thousandths Understand place value concepts through thousandths Convert decimals to fractions	Perform basic operations on decimals, integers, proper fractions and mixed numbers
Ratio, Proportion and Percent			Introduction of 100, 50 and 25 percent	Use ratios to solve problems Find equivalent ratios Solve problems with percent Convert fractions to percent Find a percent of a number	Write as a ratio the relationship between two quantities Write ratios in the simplest form Divide a quantity in a given ratio Express one quantity as a percentage of another Convert fractions to percentages and percentages to fractions Determine percentages of given quantities Determine estimates of percentages not exceeding 100

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					Increase or decrease a number by a given percentage
					Calculate profit, loss, percentage profit and loss, discount, and discount price, taxes, sales price
					Distinguish among the terms principal, cost price, selling price, instalment and deposit
					Calculate the cost price given the selling price and the profit or loss as a sum of money
					Calculate selling price given cost price and profit or loss as a sum of money
					Solve problems involving profit and loss
					Calculate total hire purchase price
					Solve problems involving hire purchase
					Calculate the simple interest and total amount for period of terms, including months and years (the use of formula is not required)
					Use knowledge of simple and compound interest to make decisions
					Calculate depreciation for 2 years (the use of formula is not required)
					Distinguish between taxable income and non-taxable income

					Solve problems related to income tax
					Perform calculations to obtain salaries and wages
					Calculate commission based on services rendered
					Solve problems involving wages, salaries, overtime and commission

Operations					

	Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 – 2
Whole number computation: Addition and Subtraction Whole number computation: Addition and Subtraction in real-world problems	Model addition and subtraction with place value Recall addition and subtraction facts Use different methods to develop fluency in adding and subtracting multi-digit numbers Add and subtract whole numbers to 1000 Solve multi-digit addition and subtraction problems by using a bar model	Model regrouping in addition and subtraction with place value Add and subtract whole numbers to 10.000 Solve addition and subtraction problems with greater numbers by using a bar model	Model regrouping in addition and subtraction using place value strategies. Add whole numbers to 100.000 using the standard algorithm Add multi-digit numbers with and without regrouping Subtract whole numbers to 100.000 using the standard algorithm Subtract multi-digit whole numbers with and without regrouping using the standard algorithm	Add whole numbers to 1.000.000 using the standard algorithm Add multi-digit numbers with and without regrouping Subtract whole numbers to 1.000.000 using the standard algorithm Subtract multi-digit whole numbers with and without regrouping using the standard algorithm	Calculate a bill given the costs of a number of items Relate interest to buying, selling and saving Perform basis operations on decimals, integers, proper fractions and mixed numbers
Whole Number Computation: Multiplication and Division concepts Whole Number Computation: Multiplication and Division algorithms	Represent division as repeated subtraction Use the x, : and = symbols to represent multiplication and division situations Use bar models to represent multiplication and division situations Solve multiplication and division fact problems	Multiply and divide with 6, 7, 8 and 9 Represent multiplication in different ways Represent division in different ways Multiply 1s, 10s and 100s with and without regrouping Use addition and multiplication properties to multiply Divide 10s and 1s with and without regrouping, no remainder Use bar models to represent multiplication and division situations Solve one- and two step	Apply and understanding of models for multiplication and division Recall multiplication facts and related division facts Develop fluency in multiplying multi-digit numbers Divide by a 1-digit number with a remainder Solve multi-digit multiplication and division problems	Solve multi-digit multiplication and division problems Multiply multi-digit numbers Write numbers in word form, expanded form and standard form	Multiply multi-digit numbers Find quotients involving multi-digit dividends Solve multiplication and division problems Select the most useful form of the quotient and interpret the remainder Use the calculator to perform basis mathematical operations Use the calculator to obtain squares and square roots of numbers Read and interpret displayed quantities on the calculator

		multiplication and division problems			Perform basis operations on decimals, integers, proper fractions and mixed numbers

Operations (continuation)

	Group 5 – grade 3	**Group 6 – grade 4**	**Group 7 – grade 5**	**Group 8 – grade 6**	**Form 1 – 2**
Fraction computation	Add and subtract like fractions (halves, thirds, fourths)	Add and subtract like fractions	Add and subtract unlike fractions Solve problems with addition and subtraction of decimals	Add and subtract unlike fractions and mixed numbers Multiply proper fractions, improper fractions, mixed numbers and whole numbers Divide fractions by whole numbers Solve word problems with addition, subtraction, multiplication and division of fractions	Perform basic operations on decimals, integers, proper fractions and mixed numbers Solve problems involving integers, fractions, and decimals
Decimal computation	Solve addition and subtraction money problems	Add and subtract money amounts	Identify decimal numbers Write decimal numbers Represent decimal numbers on place value chart Add and subtract decimals using real world problems	Add and subtract decimals Solve problems with addition and subtraction of decimals	Add and subtract decimals Multiply and divide decimals by whole numbers Solve problems with multiplication and division of decimals Perform basic operations on decimals, integers, proper fractions and mixed numbers

Operations (continuation)					
	Group 5 – grade 3	**Group 6 – grade 4**	**Group 7 – grade 5**	**Group 8 – grade 6**	**Form 1 – 2**
Estimation and mental math	Use mental math strategies to add and subtract Round to the nearest ten to estimate sums and differences	Use mental math strategies to add and subtract, multiply and divide Use estimation and rounding to estimate sums and difference	Use mental math and estimation strategies to find sums, differences, products and quotients Decide whether an estimate or exact answer is needed Use estimation in determining relative sizes of amounts or distances Round and estimate with decimals	Use estimation and mental math to estimate sums, differences, products and quotients Estimate sums and differences with fractions and decimals Estimate products and quotients with decimals	Estimate results of operations with integers, money, decimals and proper fractions

		Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 – 2
Algebra						
Patterns			Create and analyse multiplication and division patterns

Skip count by 6s, 7s, 8s and 9s

Analyse number and counting patterns | Identify, describe and extend numeric and non-numeric patterns

Use a ruler to describe a sequence of numbers or objects | Identify, describe and extend numeric patterns involving all operations

Find rules to complete number patterns | Recognize patterns in sets and sequences of numbers

Complete and extend sequences according to a given pattern or rule

Use symbols to represent number patterns

Solve number problems using symbols

Write multiples and factors of whole numbers |
| Properties | | | Understand that multiplication and division are related

Create and analyse multiplication and division patterns

Model, define and explain properties of multiplication | Represent division as the inverse of multiplication | Represent division as the inverse of multiplication | Deduce the inverse of a given number sentence |
| Number Theory | | | Identify odd and even numbers | Find the greatest common factor and least common multiple

Identify prime and composite numbers | Find the greatest common factor and least common multiple

Identify prime and composite numbers | Write multiples and factors of whole numbers

Classify types of numbers using the knowledge of set theory

Distinguish between types of numbers:
a. natural and whole numbers
b. odd and even
c. prime and composite
d. whole numbers and integers |

		Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 – 2
Algebra (continuation)						
Functional Relationships			Understand the relationships between the numbers in multiplication and division fact families Describe number relationships in context	Understand the relationships between the numbers and symbols in formulas for area and perimeter Describe number relationships in context	Understand the relationships between the numbers and symbols in formulas for surface area and volume Describe number relationships in context	Convert fractions to percentages and percentages to fractions
Expressions/Models			Use a variety of concrete, pictorial and symbolic models for multi-digit addition, subtraction, multiplication and division	Use a variety of concrete, pictorial and symbolic models for multiplication and division; and addition and subtraction with fractions and decimals	Use letters as variables Simplify algebraic expressions Use the order of operations in numeric expressions with two or more operations	Solve and verify simple linear equations in one unknown by using an algebraic approach
Number Sentences and Equations			Write multiplication and division number sentences Write and solve number sentences for one- and two step real-world problems Determine the missing parts (quantities or symbols) in number sentences	Write and solve number sentences for one-, two-, and three-step real-world problems Use bar models and number sentences for one-, two-, and three-step real-world problems Determine the missing parts (quantities or symbols) in number sentences	Write and solve number sentences and equations form one- and two-step real-world problems Write and solve equations Graph linear equations	Solve and verify simple linear equations in one unknown by using an algebraic approach
Equality and Inequality			Understand equality and inequality Write and solve inequalities	Understand equality and inequality	Understand equality and inequality	Understand equality and inequality Solve and verify simple linear equations in one unknown by using an algebraic approach

			Geometry		

	Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 - 2
Size and Position					Describe directions appropriately using cardinal points
Lines and Angles	Identify parts of lines and curves	Identify perpendicular and parallel lines Identify right angles and compare angels to right angles	Identify different kinds of lines, i.e. horizontal and vertical Name and draw lines Use lines to make objects Identify lines of different objects Identify, read and draw angles Describe why different lines are used in different objects Recognize that angle can be broken down into smaller parts Draw and measure angles	Draw perpendicular and parallel lines Construct and measure angles	Work with angles on a straight line Work with angles at a point Identify types of lines Differentiate between types of angles Calculate unknown angles of polygons using the properties of the particular polygon Calculate the number of sides of a regular polygon given the sum of the interior angles
Expression/Models	Identify patterns in 2D shape	Identify patterns in 2D and 3D shapes/models to solve geometric equations	Use formulas to solve geometric equations		Draw nets of solids Solve problems relating to plane shapes
Two Dimensional Shapes	Identify, describe, sort and classify two-dimensional shapes Identify parts of lines and curves Compose and decompose two dimensional shapes Develop foundations for understanding area	Describe, analyse, compare and classify two-dimensional shapes by their sides and angles Classify and sort polygons and quadrilaterals by attributes and properties Investigate composing and decomposing two-dimensional shapes Use attributes and properties to solve problems	Apply the properties of squares and rectangles Find unknown angle measures and side lengths of squares and rectangles Identify figures that form tessellations Understand the relationships between the numbers and symbols in formulas area and perimeter	Apply the properties of right, isosceles and equilateral triangles Apply the sum of the angle measures of a triangle Apply the properties of a parallelogram, rhombus and trapezoid Demonstrate that the sum of any two side lengths of a triangle is greater than the length of the third side	State the properties of a given plane shape State the relationship among the sides of right angled triangles

		Find and compare the area of plane figures in different square units		Find the area of a triangle	

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	Group 5 – grade 3	**Group 6 – grade 4**	**Group 7 – grade 5**	**Group 8 – grade 6**	**Form 1 – 2**
Three Dimensional Shapes	Identify, describe, sort and classify three-dimensional shapes Identify surfaces that slide, stack and roll	Identify, make, classify, sort and group three dimensional shapes	Use three dimensional shapes to make objects. Identify different three dimensional shapes on different objects Carry out hands on activities to explain how the move and function on different objects Draw and analyse three dimensional shapes	Identify and classify prisms and pyramids Identify the solid that can be made from a net Identify cylinders, spheres and cones Describe cylinders, spheres and cones by the number of and types of faces, and the number of edges and vertices Build solids using unit cubes	Classify regular shapes into sets and subsets of polygons Classify solids as cubes, cuboids, cylinders and cones Identify characteristics of regular solids
Congruence and Symmetry		Identify symmetrical figures and one line of symmetry Solve problems involving congruency	Identify line and rotational symmetry	Identify line and rotational symmetry Relate rotational symmetry to turns and congruency	State the properties of a given plane shape
Transformations		Identify pairs of shapes that show a flip, slide and turn Demonstrate that figures and their flip, slide and turn images are congruent	Use transformations to form tessellations		
Coordinate Geometry			Develop coordinate readiness with tables and line graphs	Plot points on a coordinate grid first quadrant only	Describe directions appropriately using cardinal points

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	Measurement				

	Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 - 2
Length and Distance	Demonstrate linear measure as an iteration of units Use rulers to measure length Measure lengths in meters, centimetres, feet, and inches Compare and measure lengths using customary and metric units Demonstrate partitioning and transitivity in relation to length Solve problems involving estimating, measuring and computing length	Select appropriate units and tools to estimate and measure length Use meter sticks, 12-inch rulers and yardsticks to measure length Measure length to the nearest half inch and inch Use referents to estimate distance Estimate and measure length, distance and height in meters, centimetres and kilometres Convert among metric units of length Solve one- and two-step real-world problems in measurement	Convert among units of length Convert customary units of length Solve real world problems in measurement (length)	Use measurement conversion of length in solving real world problems Convert smaller units to larger units using decimal notations.	Identify the appropriate measuring instrument for measuring length and mass Identify the most appropriate unit for measuring a given quantity Measure length and mass accurately Convert from one unit to another within the same system Convert from one system of measure to another and between systems
Weight, Mass	Compare and measure masses Solve mass problems	Select appropriate units and tools to estimate and measure weight Use referents to estimate weight Estimate and find masses of objects Convert among units of mass	Convert among units of mass Convert customary units of weight	Convert and estimate volume in cubic units Solve real life problems	Identify the appropriate measuring instrument for measuring length and mass Identify the most appropriate unit for measuring a given quantity Measure length and mass accurately Convert from one unit to another within the same system Convert from one system of measure to another and between systems

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		Measurement (continuation)			

	Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 – 2
Capacity, Volume	Measure volume (capacity) in litres Solve volume problems	Select appropriate tools and units to estimate and measure volume and capacity Determine the volume and capacity of a container Relate the units of customary capacity to one another Use referents to estimate capacity Estimate and measure capacity in litres and millilitres Convert among metric units of capacity	Convert among metric units of capacity/volume	Use formulas to find volume Solve real life problems	Calculate the volume of cylinder, cube and cuboid Make reasonable estimates of volumes
Time	Use am and pm to write time Tell time to five minutes Find elapsed time	Read time on a digital clock Convert between hours and minutes Determine elapsed time Add and subtract units of time	Understand the relative sizes of measurement units Convert units of time	Read time on analog and digital clocks Compare time from a different time zone	Perform calculations involving time Solve problems relating to time, distance and speed
Temperature		Read a thermometer Choose the appropriate tool and unit to measure temperature Use referents to estimate temperature	Identify objects used for measuring temperature Identify reading scale Read a thermometer	Read different thermometers (Fahrenheit and Celsius) and comparing readings scales Measure temperature and record reading	Measure temperature Convert from degree Celsius to degree Fahrenheit and vice versa Make reasonable estimate of temperature equivalence on Celsius and Fahrenheit scales
Angles		Compare angles to right angles Identify different angles Name, identify, measure and draw different angles	Estimate and measure angels with a protractor Classify angles by angle measure Relate ¼- , ½- , ¾ - and	Apply the idea that the sum of angles on a straight line is 180 Apply the idea that vertical angles are equal in measure	Differentiate between types of angles Calculate unknown angles of polygons using the properties of the particular polygon

		full turns to the number of right angles	Apply the idea that the sum of angles at a point is 360	Calculate the number of sides of a regular polygon given the sum of the interior angles

Measurement (continuation)

	Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 – 2
Perimeter		Measure perimeter of plane figures Choose the appropriate tool, unit and strategy to measure perimeter Estimate the perimeter of surfaces and objects	Find the perimeter of composite figures Solve problems involving the perimeter of squares, rectangles and composite figures		Find the perimeter and the area of regular and irregular plane shapes
Area		Find and compare the area of plane figures in different square units Make different plane figures with the same area Estimate area of small and large surfaces Compare the area and perimeter of two plane figures Find the area of rectangles and composite figures	Explain area as an attribute of two-dimensional figures Connect area measure to the area model for multiplication; use it to justify the formula for the area of a rectangle Estimate and measure area in square units Select appropriate units, strategies, and tools to solve area problems Explain the relationships among area formulas of different polygons	Find the area of triangles Find the area of a rectangle with traditional side lengths	Find the perimeter and the area of regular and irregular plane shapes
Surface Area and Volume		Decompose solid figures to find the surface area Estimate and measure volume in cubic units	Identify surface areas of different objects Decompose solid figures to find surface area	Decompose solid figures to find surface area Make objects with the use of surface area Solve real life problems	Solve practical problems relating to surface area and volume Calculate the volume of cylinder, cube and cuboid Make reasonable estimates of volumes

	Data Analysis				

	Group 5 – grade 3	**Group 6 – grade 4**	**Group 7 – grade 5**	**Group 8 – grade 6**	**Form 1 - 2**
Classifying and Sorting Collect and Organize Data Represent Data Data analysis	Classify and sort two- and three dimensional shapes by properties Collect and organize data in picture graphs Collect and organize data in different ways Represent data in picture graphs Interpret picture graphs with scales Solve real world problems using picture graphs	Classify and sort polygons and quadrilaterals by attributes and properties Collect and organize data in bar graphs and line plots Interpret picture and bar graphs with scales Use frequency tables, bar graphs and line plots to solve real-world problems	Construct line plots, stem-and-leaf plots, tables and line graphs Interpret tally charts, bar graphs, picture graphs, tables and line graphs Find the mean (average), median, mode and range of a data set	Represent data in a double graph, such as double bar graph analyse data in a double graph, such as double bar graph	Identify a typical representation of a given population Obtain data by using different data collection methods Make and use tally charts to count items in a data set Tabulate data extracted from familiar sources in the immediate surroundings Construct simple bar charts, line graphs and ungrouped frequency tables State the minimum and maximum value in a set of data Determine the range, mean, median, mode of a set of data Use calculation to show how extreme values may affect the mean of a set of scores Make inferences based on statistical measures Interpret information in frequency tables, ungrouped data, bar chart, pie charts and line graphs Draw inferences from data to make predictions

Probability					

	Group 5 – grade 3	**Group 6 – grade 4**	**Group 7 – grade 5**	**Group 8 – grade 6**	**Form 1 – 2**
Outcomes			Decide whether an outcome is certain, more likely, equally likely, less likely of impossible	Determine experimental probability of an outcome	Identify events that have a chance of occurring or not occurring
Expressing Probability			Express the probability of an event as a fraction	Compare the results of an experiment with theoretical probability Find all possible combinations buy listing, making a tree diagram and multiplying	Identify events that have a chance of occurring or not occurring Calculate simple probability

	Problem Solving				
	Group 5 – grade 3	**Group 6 – grade 4**	**Group 7 – grade 5**	**Group 8 – grade 6**	**Form 1 – 2**
Build skills through problem solving	Build skills in addition, subtraction, multiplication, division and measurement through problem solving	Build skills in addition, subtraction, multiplication, division and measurement through problem solving	Build skills in multiplication, division, fraction concepts, data analysis and measurement through problem solving	Build skills in multiplication; division; fractions concepts, decimals, ratios and percent's; data analysis; and measurement through problem solving	Draw inferences from data to make predictions
Solve real-world problems	Solve real-world problems involving addition, subtraction, multiplication, division and measurement	Solve real-world problems involving addition, subtraction, multiplication, division and measurement	Solve real-world problems involving multiplications, division, fraction concepts, data analysis and measurement, addition, subtraction	Solve real-world problems involving multiplications, division, fraction concepts, decimals, ratios and percent's; data analysis and measurement	Identify trends from a given set of data Draw inferences from data to make predictions
Use appropriate strategies and thinking skills to solve problems	Apply problem-solving strategies in Put on Your Thinking Cap! and Problem-Solving activities	Apply problem-solving strategies in Put on Your Thinking Cap! and Problem-Solving activities	Use appropriate strategies to solve real-world problems	Use appropriate strategies to solve real-world problems	Use appropriate strategies to solve real-world problems Identify events that have a chance of occurring or not occurring
Apply and explain problem solving	Apply and explain problem solving processes in Put on Your Thinking Cap! and other activities	Apply and explain problem solving processes in Put on Your Thinking Cap! and other activities	Apply and explain problem solving processes in Put on Your Thinking Cap! and other activities	Apply and explain problem solving processes in Put on Your Thinking Cap! and other activities	Apply and explain problem solving processes in Put on Your Thinking Cap! and other Activities Identify patterns (trends) from a given set of data
Explore concepts	Explore concepts more deeply and justify reasoning in Let's Explore and Hands-On activities Apply Thinking Skills, Put on Your Thinking Cap! Challenging Practice, and Problem-Solving activities	Explore concepts more deeply and justify reasoning in Let's Explore and Hands-On activities Apply Thinking Skills, Put on Your Thinking Cap! Challenging Practice, and Problem-Solving activities	Explore concepts more deeply and justify reasoning in Let's Explore and Hands-On activities Apply Thinking Skills, Put on Your Thinking Cap! Challenging Practice, and Problem-Solving activities	Explore concepts more deeply and justify reasoning in Let's Explore and Hands-On activities Apply Thinking Skills, Put on Your Thinking Cap! Challenging Practice, and Problem-Solving activities	Explore concepts more deeply and justify reasoning in Let's Explore and Hands-On activities Apply Thinking Skills, Put on Your Thinking Cap! Challenging Practice, and Problem-Solving Activities Identify events that have a chance of occurring or not occurring
Investigate mathematical ideas	Further investigate mathematical ideas by competing critical thinking skills activities	Further investigate mathematical ideas by competing critical thinking skills activities	Further investigate mathematical ideas by competing critical thinking skills activities	Further investigate mathematical ideas by competing critical thinking skills activities	Further investigate mathematical ideas by competing critical thinking skills activities

					Identify events that have a chance of occurring or not occurring

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	Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 – 2
Identify, demonstrate and explain mathematical proof	Demonstrate the inverse relationship between the size of a unit and the number of units Identify, describe, sort and classify two- and three-dimensional shapes Interpret picture graphs with scales Identify rules for number patterns	Demonstrate that figures and their flip, slide and turn images are congruent Identify pairs of shapes that show a flip, slide and turn Interpret bar graphs with scales Create and analyse multiplication and division patterns	Show that some figures can be turned and not change shape or size (rotational symmetry) Use properties of squares and rectangles to solve problems Analyse a data set by finding its mean, median, mode and range Identify, describe and extend numeric and non-numeric patterns	Apply the idea that the sum of angles on a straight line is 180 Apply the idea that the sum of angles at a point is 360 Explain the relationships among area formulas of different polygons Compare the results of an experiment to validate the use of theoretical probability Identify, describe and extend numeric patterns involving all Operations	
Use a variety of reasoning skills	Identify surfaces that slide, stack and roll Explore the inverse relationship between addition and subtraction	Model, define, and explain properties of multiplication Explore the inverse relationship between multiplication and division Use estimation to check reasonableness	Use properties of squares and rectangles to solve problems about area and perimeter Use estimation to check reasonableness (whole number addition, subtraction, multiplication and division	Explore the relationship among lists, tree diagrams and multiplication to calculate combinations Use properties of multiplication (including the distributive property) in estimation and mental math	

Communication					
	Group 5 – grade 3	**Group 6 - grade 4**	**Group 7 – grade 5**	**Group 8 – grade 6**	**Form 1 – 2**
Consolidate mathematical thinking	Students build new mathematical knowledge through problem solving Students solve problems that arise in mathematics and in other contexts	Students apply and adapt a variety of appropriate strategies to solve problems Students monitor and reflect on the process of mathematical problem solving	Students share and clarify their ideas, understandings, and solutions	Students ask effective questions to acquire knowledge; listen to all points of view and ensure that those views are heard; voice their own opinions; and advocate for ideas	Students recognize reasoning and proof as fundamental aspects of mathematics Students make and investigate mathematical conjectures
Communicate with peers, teachers and others	Students interact with materials and use various kinds of communication skills while interfacing with peers, teachers and others during the learning process	Students use different communication skills in sharing during learning interaction demonstrating their understanding of the concept	Students construct knowledge and apply what they learn to all areas of their lives – at school, home, and work; among friends; and in the community – with a focus on making connections and understanding relationships	Students construct knowledge and apply what they learn to all areas of their lives – at school, home, and work; among friends; and in the community – with a focus on making connections and understanding relationships	Students develop and evaluate mathematical arguments and proofs and share their ideas in their own words Students select and use various types of communication reasoning and methods
Share mathematical thinking	Students discuss ideas and concepts to reinforce concept building and solving problems	Students discuss ideas and concepts to reinforce concept building and solving problems	Students provide meaningful descriptive feedback to peers; and asks questions and co-construct knowledge, meaning and content	Students provide meaningful descriptive feedback to peers; and asks questions and co-construct knowledge, meaning and content	Students provide meaningful descriptive feedback to peers; and asks questions and co-construct knowledge, meaning and content
Express mathematical ideas	Students create and explain mathematical problems, explain how they obtain their answers; steps and procedures used	Students create and explain mathematical problems, explain how they obtain their answers; steps and procedures used	Students create and explain mathematical problems, explain how they obtain their answers; steps and procedures used	Students communicate effectively in different contexts, orally and in writing, using a variety of media	Students communicate effectively in different contexts, orally and in writing, using a variety of media

	Group 5 – grade 3	Group 6 - grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 – 2
Recognize connections in mathematical ideas	Students have the ability to address complex, real-world problems by acquiring and analyzing information in order to take informed action	Students have the ability to address complex, real-world problems by acquiring and analyzing information in order to take informed action	Students have the ability to address complex, real-world problems by acquiring and analyzing information in order to take informed action	Students have the ability to address complex, real-world problems by acquiring and analyzing information in order to take informed action	Students have the ability to address complex, real-world problems by acquiring and analyzing information in order to take informed action
Understand how concepts build on one another	Students engage in inquiry processes that include locating, processing, interpreting, synthesizing, and critically analyzing information in order to solve problems and make informed decisions	Students engage in inquiry processes that include locating, processing, interpreting, synthesizing, and critically analyzing information in order to solve problems and make informed decisions	Students engage in inquiry processes that include locating, processing, interpreting, synthesizing, and critically analyzing information in order to solve problems and make informed decisions	Students use the processes involve critical, digital, and data literacy	Students use the processes involve critical, digital, and data literacy
Solve real-world problems in contexts outside of mathematics	Students identify and analyze the problem, create a plan, prioritize actions to be taken, and act on the plan – as they address issues and design and manage projects	Students identify and analyze the problem, create a plan, prioritize actions to be taken, and act on the plan – as they address issues and design and manage projects	Students identify and analyze the problem, create a plan, prioritize actions to be taken, and act on the plan – as they address issues and design and manage projects	Students solve meaningful and complex real-life problems by taking concrete steps – identifying and analyzing the problem, creating a plan, prioritizing actions to be taken, and acting on the plan – as they address issues and design and manage projects	Students solve meaningful and complex real-life problems by taking concrete steps – identifying and analyzing the problem, creating a plan, prioritizing actions to be taken, and acting on the plan – as they address issues and design and manage projects

	Group 5 – grade 3	Group 6 – grade 4	Group 7 – grade 5	Group 8 – grade 6	Form 1 – 2
Representation					
Use presentations to model, organize and record	Students increase opportunities for the use of critical thinking skills (e.g., selecting appropriate tools and strategies, estimating, evaluating, classifying, assuming, recognizing relationships, conjecturing, posing questions, offering opinions with reasons, making judgements) to develop mathematical reasoning	Students increase opportunities for the use of critical thinking skills (e.g., selecting appropriate tools and strategies, estimating, evaluating, classifying, assuming, recognizing relationships, conjecturing, posing questions, offering opinions with reasons, making judgements) to develop mathematical reasoning	Students increase opportunities for the use of critical thinking skills (e.g., selecting appropriate tools and strategies, estimating, evaluating, classifying, assuming, recognizing relationships, conjecturing, posing questions, offering opinions with reasons, making judgements) to develop mathematical reasoning	Students detect patterns, make connections, and transfer or apply what they have learned in a given situation to other situations, including real-world situations	Students create and use representations to organize, record, and communicate mathematical ideas Students select, apply, and translate among mathematical representations to solve problems Students use representations to model and interpret physical, social, and mathematical ideas and connections
Select and apply representations to model problems	Students will create and use representations to organize, record, and communicate mathematical ideas and using the correct terms	Students will elect, apply, and translate among mathematical representations to solve problems Students use concept terms correctly	Students will and interpret physical, social, and mathematical concepts and using the correct terms	Students will use knowledge to solve real life problems	Students will use knowledge to solve real life problems
Interpret phenomena through representations	Students will make connections among mathematical knowledge, concepts, and skills used in their daily lives	Students will make connections among mathematical knowledge, concepts, and skills, and between the classroom and situations outside the classroom	Students will make connections among mathematical knowledge, concepts, and skills, and between the classroom and situations outside the classroom	Students will engage in inquiry processes that include locating, processing, interpreting, synthesizing, and critically analyzing information in order to solve problems and make informed decisions. These processes involve critical, digital, and data literacy	Students will engage in inquiry processes that include locating, processing, interpreting, synthesizing, and critically analyzing information in order to solve problems and make informed decisions. These processes involve critical, digital, and data literacy

Als landelijk expertisecentrum richt SLO zich op de ontwikkeling van het curriculum in het primair, speciaal en voortgezet onderwijs in Nederland. We werken met het onderwijsveld aan de doelen, kaders en instrumenten waarmee scholen hun opdracht vanuit een eigen visie kunnen vervullen.

We brengen praktijk, beleid, maatschappelijke ontwikkelingen en onderzoek samen en stellen onze expertise beschikbaar aan onderwijs en overheid, bijvoorbeeld in de vorm van leerplannen, tools, voorbeeldlesmaterialen, conferenties en rapporten.