Grade One

Data Handling	Measurement	Shape and Space	Pattern and Function	Number
Data handling allows us to make a summary of what we know about the world and to make inferences about what we do not know. ● Data can be collected, organized, represented and summarized in a variety of ways to highlight similarities, differences and trends; the chosen format should illustrate the information without bias or distortion. ● Probability can be expressed qualitatively by using terms such as “unlikely”, “certain” or “impossible”. It can be expressed quantitatively on a numerical scale.	To measure is to attach a number to a quantity using a chosen unit. Since the attributes being measured are continuous, ways must be found to deal with quantities that fall between numbers. It is important to know how accurate a measurement needs to be or can ever be.	The regions, paths and boundaries of natural space can be described by shape. An understanding of the interrelationships of shape allows us to interpret, understand and appreciate our two-dimensional (2D) and three-dimensional (3D) world.	To identify pattern is to begin to understand how mathematics applies to the world in which we live. The repetitive features of patterns can be identified and described as generalized rules called “functions”. This builds a foundation for the later study of algebra.	Our number system is a language for describing quantities and the relationships between quantities. For example, the value attributed to a digit depends on its place within a base system. Numbers are used to interpret information, make decisions and solve problems. For example, the operations of addition, subtraction, multiplication and division are related to one another and are used to process information in order to solve problems. The degree of precision needed in calculating depends on how the result will be used.

Conceptual Understandings				
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.	Measurement involves comparing objects and events. Objects have attributes that can be measured using non-standard units. Events can be ordered and sequenced.	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.	Patterns and sequences occur in everyday situations. Patterns repeat and grow.	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.
Application of Concepts				
Represent information through pictographs and tally marks, sort and label real objects by attributes. Students will create pictographs and tally marks. Create living graphs using real objects and people.	Estimate and measure objects using standard units of measurement: length, mass, capacity, money and temperature. Read and write the time to the hour, half hour and quarter hour. Estimate and compare lengths of time: second,	Sort, describe and compare 3D shapes. Describe position and direction, for example, inside, outside, above, below, next to, behind, in front of, up, down. Explore and describe the paths, regions and boundaries of their	Describe patterns in various ways, for example, using words, drawings, symbols, materials, actions, numbers. Extend and create patterns.	Connect number names and numerals to the quantities they represent. Count to determine the number of objects in a set. Use number words and numerals to represent quantities in real-life Situations.

Describe real objects and events by attributes.	minute, hour, day, week and month. Use standard units of measurement to solve problems in real-life situations involving length, mass, capacity, money and temperature. Use measures of time to assist with problem solving in real-life situations.	immediate environment (inside, outside, above, below) and their position (next to, behind, in front of, up, down).		Use the language of mathematics to compare quantities in real-life situations, for example, more, less, first, second. Subitize in real-life situations. Use simple fraction names in real-life situations.
Learning outcomes				
When constructing meaning learners: understand that sets can be organized by different attributes. Understand that information about themselves and their surroundings can be obtained in different ways.	Understand the use of standard units to measure, for example, length, mass, money, time, temperature. Understand that tools can be used to measure. Understand that calendars can be used to determine the date, and to identify and sequence days of the	Understand that 2D and 3D shapes have characteristics that can be described and compared. Understand that common language can be used to describe position and direction, for example, inside, outside, above, below, next to, behind, in front of, up, down.	Understand that patterns can be found in everyday situations, for example, sounds, actions, objects, nature.	Understand one-to-one Correspondence. Understand that, for a set of objects, the number name of the last object counted describes the quantity of the whole set. Understand that numbers can be constructed in multiple ways, for

Discuss chance in daily events (impossible, maybe, certain).	week and months of the year. Understand that time is measured using universal units of measure, for example, years, months, days, hours, minutes and seconds.			example, by combining and partitioning. Understand conservation of number. Understand the relative magnitude of whole numbers. Recognize groups of zero to five objects without counting (subitizing). Understand whole-part relationships. Use the language of mathematics to compare quantities, for example, more, less, first, second.
COMMON CORE STANDARDS				
The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here

Grade Two

Data Handling	Measurement	Shape and Space	Pattern and Function	Number
Data handling allows us to make a summary of what we know about the world and to make inferences about what we do not know. ● Data can be collected, organized, represented and summarized in a variety of ways to highlight similarities, differences and trends; the chosen format should illustrate the information without bias or distortion. ● Probability can be expressed qualitatively by using terms such as “unlikely”, “certain” or “impossible”. It can be expressed quantitatively on a numerical scale.	To measure is to attach a number to a quantity using a chosen unit. Since the attributes being measured are continuous, ways must be found to deal with quantities that fall between numbers. It is important to know how accurate a measurement needs to be or can ever be.	The regions, paths and boundaries of natural space can be described by shape. An understanding of the interrelationships of shape allows us to interpret, understand and appreciate our two-dimensional (2D) and three-dimensional (3D) world.	To identify pattern is to begin to understand how math ematics applies to the world in which we live. The repetitive features of patterns can be identified and described as generalized rules called “functions”. This builds a foundation for the later study of algebra.	Our number system is a language for describing quantities and the relationships between quantities. For example, the value attributed to a digit depends on its place within a base system. Numbers are used to interpret information, make decisions and solve problems. For example, the operations of addition, subtraction, multiplication and division are related to one another and are used to process information in order to solve problems. The degree of precision needed in calculating depends on how the result will be used.
Conceptual Understandings				
Information can be expressed as	Language to identify, compare, order and	Shapes are classified and named	Whole numbers exhibit patterns and	The base 10 place value system is used

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.	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.	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.	relationships that can be observed and described. Patterns can be represented using numbers and other symbols.	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.
Application of Concepts				
collect and represent data in different types of graphs, for example, tally marks, bar graphs represent the relationship between	estimate and measure objects using standard units of measurement: length, mass, capacity, money and temperature	sort, describe and label 2D and 3D shapes analyse and describe the relationships between 2D and 3D shapes	represent patterns in a variety of ways, for example, using words, drawings, symbols, materials, actions, numbers describe number patterns, for	read and write whole numbers up to hundreds or beyond read, write, compare and order cardinal and ordinal numbers

objects in sets using tree, Venn and Carroll diagrams express the chance of an event happening using words or phrases (impossible, less likely, maybe, most likely, certain). Students will 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 (for example, more, fewer, less than, greater than) use tree, Venn and Carroll diagrams to explore relationships between data identify and describe chance in daily events (impossible, less likely, maybe, most likely, certain).	read and write the time to the hour, half hour and quarter hour estimate and compare lengths of time: second, minute, hour, day, week and month. use standard units of measurement to solve problems in real-life situations involving length, mass, capacity, money and temperature use measures of time to assist with problem solving in real-life situations.	create and describe symmetrical and tessellating patterns identify lines of reflective symmetry represent ideas about the real world using geometric vocabulary and symbols, for example, through oral description, drawing, modelling, labelling interpret and create simple directions, describing paths, regions, positions and boundaries of their immediate environment. bout 3D shapes to describe and work with 2D shapes recognize and explain simple symmetrical designs in the environment apply knowledge of symmetry to problem-solving situations	example, odd and even numbers, skip counting. extend and create patterns in numbers, for example, odd and even numbers, skip counting use number patterns to represent and understand real-life situations use the properties and relationships of addition and subtraction to solve problems.	describe mental and written strategies for adding and subtracting two-digit numbers. use whole numbers up to hundreds or beyond in real-life situations use cardinal and ordinal numbers in real-life situations use fast recall of addition and subtraction number facts in real-life situations use fractions in real-life situations use mental and written strategies for addition and subtraction of two digit numbers or beyond in real-life situations select an appropriate method for solving a problem, for example, mental estimation, mental or written strategies, or by using a calculator

		interpret and use simple directions, describing paths, regions, positions and boundaries of their immediate environment.		use strategies to evaluate the reasonableness of answers.
Learning outcomes				
When constructing meaning learners: understand that sets can be organized by one or more attributes understand that information about themselves and their surroundings can be collected and recorded in different ways understand the concept of chance in daily events (impossible, less likely, maybe, most likely, certain).	understand the use of standard units to measure, for example, length, mass, money, time, temperature understand that tools can be used to measure understand that calendars can be used to determine the date, and to identify and sequence days of the week and months of the year understand that time is measured using universal units of measure, for example, years, months, days, hours,	understand that there are relationships among and between 2D and 3D shapes understand that 2D and 3D shapes can be created by putting together and/or taking apart other shapes understand that examples of symmetry and transformations can be found in their immediate environment understand that geometric shapes are useful for representing real-world situations	understand that patterns can be found in numbers, for example, odd and even numbers, skip counting understand the inverse relationship between addition and subtraction understand the associative and commutative properties of addition.	model numbers to hundreds or beyond using the base 10 place value system** estimate quantities to 100 or beyond model simple fraction relationships use the language of addition and subtraction, for example, add, take away, plus, minus, sum, difference model addition and subtraction of whole numbers develop strategies for memorizing addition and subtraction number facts

	minutes and seconds.	understand that directions can be used to describe pathways, regions, positions and boundaries of their immediate environment.		estimate sums and differences understand situations that involve multiplication and division model addition and subtraction of fractions with the same denominator.
COMMON CORE STANDARDS				
The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here

Grade Three

Data Handling	Measurement	Shape and Space	Pattern and Function	Number
Data handling allows us to make a summary of what we know about the world and to make inferences about what we do not know. ● Data can be collected, organized, represented and summarized in a variety of ways to highlight similarities, differences and trends; the chosen format should illustrate the information without bias or distortion. ● Probability can be expressed qualitatively by using terms such as “unlikely”, “certain” or “impossible”. It can be expressed quantitatively on a numerical scale.	To measure is to attach a number to a quantity using a chosen unit. Since the attributes being measured are continuous, ways must be found to deal with quantities that fall between numbers. It is important to know how accurate a measurement needs to be or can ever be.	The regions, paths and boundaries of natural space can be described by shape. An understanding of the interrelationships of shape allows us to interpret, understand and appreciate our two-dimensional (2D) and three-dimensional (3D) world.	To identify patterns is to begin to understand how mathematics applies to the world in which we live. The repetitive features of patterns can be identified and described as generalized rules called “functions”. This builds a foundation for the later study of algebra.	Our number system is a language for describing quantities and the relationships between quantities. For example, the value attributed to a digit depends on its place within a base system. Numbers are used to interpret information, make decisions and solve problems. For example, the operations of addition, subtraction, multiplication and division are related to one another and are used to process information in order to solve problems. The degree of precision needed in calculating depends on how the result will be used.
Conceptual Understandings				

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.	Objects and events have attributes that can be measured using appropriate tools. Relationships exist between standard units that measure the same attributes.	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.	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.	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.
Application of Concepts				
design a survey and systematically collect, organize and display data in pictographs and bar graphs	estimate and measure using standard units of measurement: perimeter, area and volume describe measures that fall between	sort, describe and model regular and irregular polygons describe and model congruency and similarity in 2D shapes	describe the rule for a pattern in a variety of ways represent rules for patterns using words, symbols and tables	read, write, compare and order whole numbers up to thousands or beyond develop strategies for memorizing

select appropriate graph form(s) to display data interpret range and scale on graphs use probability to determine mathematically fair and unfair games and to explain possible outcomes express probability using simple fractions. collect, display and interpret data using simple graphs, for example, bar graphs, line graphs identify, read and interpret range and scale on graphs identify the mode of a set of data use tree diagrams to express probability using simple fractions.	numbers on a scale read and write digital and analogue time on 12-hour and 24-hour clocks. use standard units of measurement to solve problems in real-life situations involving perimeter, area and volume select appropriate tools and units of measurement use timelines in units of inquiry and other real-life situations.	analyse angles by comparing and describing rotations: whole turn; half turn; quarter turn; north, south, east and west on a compass locate features on a grid using coordinates describe and/or represent mental images of objects, patterns, and paths. analyse and describe 2D and 3D shapes, including regular and irregular polygons, using geometrical vocabulary identify, describe and model congruency and similarity in 2D shapes recognize and explain symmetrical patterns, including tessellation, in the environment apply knowledge of transformations	identify a sequence of operations relating one set of numbers to another set. presenting patterns, for example using words, symbols and tables use number patterns to make predictions and solve problems use the properties and relationships of the four operations to solve problems.	addition, subtraction, multiplication and division number facts read, write, compare and order Fractions read and write equivalent fractions read, write, compare and order fractions to hundredths or beyond describe mental and written strategies for multiplication and division. use whole numbers up to thousands or beyond in real-life situations use fast recall of multiplication and division number facts in real-life situations tuations use mental and written strategies for multiplication and division in real-life situations

		to problem-solving situations.		select an efficient method for solving a problem, for example, mental estimation, mental or written strategies, or by using a calculator use strategies to evaluate the reasonableness of answers add and subtract fractions with related denominators in real-life situations add and subtract decimals in real-life situations, including money estimate sum, difference, product and quotient in real-life situations, including fractions and decimals.
Learning outcomes				
understand that data can be	understand the use of standard	understand the common language used to describe shapes understand the properties of regular	understand that patterns can be	model numbers to thousands or

collected, displayed and interpreted using simple graphs, for example, bar graphs, line graphs understand that scale can represent different quantities in graphs understand that the mode can be used to summarize a set of data understand that one of the purposes of a database is to answer questions and solve problems understand that probability is based on experimental events.	units to measure perimeter, area and Volume understand that measures can fall between numbers on a measurement scale, for example, 3ó kg, between 4 cm and 5 cm understand relationships between units, for example, metres, centimetres and millimetres understand an angle as a measure of rotation.	and irregular polygons understand congruent or similar Shapes understand that lines and axes of reflective and rotational symmetry assist with the construction of shapes understand an angle as a measure of Rotation understand that directions for location can be represented by coordinates on a grid understand that visualization of shape and space is a strategy for solving problems.	analysed and rules identified 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.	beyond using the base 10 place value system model equivalent fractions use the language of fractions, for example, numerator, denominator model decimal fractions to hundredths or beyond model multiplication and division of whole numbers use the language of multiplication and division, for example, factor, multiple, product, quotient, prime numbers, composite number model addition and subtraction of fractions with related denominators*** model addition and subtraction of decimals.
COMMON CORE STANDARDS				

The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here

Grade Four

Data Handling	Measurement	Shape and Space	Pattern and Function	Number
Data handling allows us to make a summary of what we know about the world and to make inferences about what we do not know. ● Data can be collected, organized, represented and summarized in a variety of ways to highlight similarities, differences and trends; the chosen format should illustrate the information without bias or distortion. ● Probability can be expressed qualitatively by using terms such as “unlikely”, “certain” or “impossible”. It can be expressed quantitatively on a numerical scale.	To measure is to attach a number to a quantity using a chosen unit. Since the attributes being measured are continuous, ways must be found to deal with quantities that fall between numbers. It is important to know how accurate a measurement needs to be or can ever be.	The regions, paths and boundaries of natural space can be described by shape. An understanding of the interrelationships of shape allows us to interpret, understand and appreciate our two-dimensional (2D) and three-dimensional (3D) world.	To identify pattern is to begin to understand how mathematics applies to the world in which we live. The repetitive features of patterns can be identified and described as generalized rules called “functions”. This builds a foundation for the later study of algebra.	Our number system is a language for describing quantities and the relationships between quantities. For example, the value attributed to a digit depends on its place within a base system. Numbers are used to interpret information, make decisions and solve problems. For example, the operations of addition, subtraction, multiplication and division are related to one another and are used to process information in order to solve problems. The degree of precision needed in calculating depends on how the result will be used.

Conceptual Understandings				
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.	Objects and events have attributes that can be measured using appropriate tools. Relationships exist between standard units that measure the same attributes.	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.	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.	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.

Application of Concepts				
design a survey and systematically collect, organize and display data in pictographs and bar graphs select appropriate graph form(s) to display data interpret range and scale on graphs use probability to determine mathematically fair and unfair games and to explain possible outcomes express probability using simple fractions. collect, display and interpret data using simple graphs, for example, bar graphs, line graphs identify, read and interpret range and scale on graphs identify the mode of a set of data use tree diagrams to express	estimate and measure using standard units of measurement: perimeter, area and volume describe measures that fall between numbers on a scale read and write digital and analogue time on 12-hour and 24-hour clocks. use standard units of measurement to solve problems in real-life situations involving perimeter, area and volume select appropriate tools and units of measurement use timelines in units of inquiry and other real-life situations.	irregular polygons describe and model congruency and similarity in 2D shapes analyse angles by comparing and describing rotations: whole turn; half turn; quarter turn; north, south, east and west on a compass locate features on a grid using coordinates describe and/or represent mental images of objects, patterns, and paths. analyse and describe 2D and 3D shapes, including regular and irregular polygons, using geometrical vocabulary identify, describe and model congruency and similarity in 2D shapes	describe the rule for a pattern in a variety of ways represent rules for patterns using words, symbols and tables identify a sequence of operations relating one set of numbers to another set. select appropriate methods for representing patterns, for example using words, symbols and tables use number patterns to make predictions and solve problems use the properties and relationships of the four operations to solve problems.	read, write, compare and order whole numbers up to thousands or beyond develop strategies for memorizing addition, subtraction, multiplication and division number facts read, write, compare and order fractions read and write equivalent fractions read, write, compare and order fractions to hundredths or beyond describe mental and written strategies for multiplication and division. use whole numbers up to thousands or beyond in real-life situations use fast recall of multiplication and division number facts in real-life

probability using simple fractions.		recognize and explain symmetrical patterns, including tessellation, in the environment apply knowledge of transformations to problem-solving situations.		situations use decimal fractions in real-life situations use mental and written strategies for multiplication and division in real-life situations select an efficient method for solving a problem, for example, mental estimation, mental or written strategies, or by using a calculator use strategies to evaluate the reasonableness of answers add and subtract fractions with related denominators in real-life situations add and subtract decimals in real-life situations, including money estimate sum, difference, product and quotient in real-life situations, including fractions and decimals.

Learning outcomes				
understand that data can be collected, displayed and interpreted using simple graphs, for example, bar graphs, line graphs understand that scale can represent different quantities in graphs understand that the mode can be used to summarize a set of data understand that one of the purposes of a database is to answer questions and solve problems understand that probability is based on experimental events.	understand the use of standard units to measure perimeter, area and volume understand that measures can fall between numbers on a measurement scale, for example, 3ó kg, between 4 cm and 5 cm understand relationships between units, for example, metres, centimetres and millimetres understand an angle as a measure of rotation.	understand the common language used to describe shapes understand the properties of regular and irregular polygons understand congruent or similar shapes understand that lines and axes of reflective and rotational symmetry assist with the construction of shapes understand an angle as a measure of rotation understand that directions for location can be represented by coordinates on a grid understand that visualization of shape and space is a strategy for solving problems.	understand that patterns can be analysed and rules identified 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.	model numbers to thousands or beyond using the base 10 place value system model equivalent fractions use the language of fractions, for example, numerator, denominator model decimal fractions to hundredths or beyond model multiplication and division of whole numbers use the language of multiplication and division, for example, factor, multiple, product, quotient, prime numbers, composite number model addition and subtraction of fractions with related denominators*** model addition and subtraction of decimals.

COMMON CORE STANDARDS				
The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here	The appropriate standards you want to address can be placed here

PYP Math Scope and Sequence

Grade Five

Data Handling	Measurement	Shape and Space	Pattern and Function	Number
Data handling allows us to make a summary of what we know about the world and to make inferences about what we do not know. ● Data can be collected, organized, represented and summarized in a variety of ways to highlight similarities, differences and trends; the chosen format should illustrate the information without bias or distortion. ● Probability can be expressed qualitatively by using terms such as “unlikely”, “certain” or “impossible”. It can be expressed quantitatively on a numerical scale.	To measure is to attach a number to a quantity using a chosen unit. Since the attributes being measured are continuous, ways must be found to deal with quantities that fall between numbers. It is important to know how accurate a measurement needs to be or can ever be.	The regions, paths and boundaries of natural space can be described by shape. An understanding of the interrelationships of shape allows us to interpret, understand and appreciate our two-dimensional (2D) and three-dimensional (3D) world.	To identify pattern is to begin to understand how mathematics applies to the world in which we live. The repetitive features of patterns can be identified and described as generalized rules called “functions”. This builds a foundation for the later study of algebra.	Our number system is a language for describing quantities and the relationships between quantities. For example, the value attributed to a digit depends on its place within a base system. Numbers are used to interpret information, make decisions and solve problems. For example, the operations of addition, subtraction, multiplication and division are related to one another and are used to process information in order to solve problems. The degree of precision needed in calculating depends on how the result will be used.
Conceptual Understandings				

Data can be presented effectively for valid interpretation and communication. Range, mode, median and mean can be used to analyse statistical data. Probability can be represented on a scale between 0–1 or 0%–100%. The probability of an event can be predicted theoretically.	Accuracy of measurements depends on the situation and the precision of the tool. Conversion of units and measurements allows us to make sense of the world we live in. A range of procedures exists to measure different attributes of objects and events.	Manipulation of shape and space takes place for a particular purpose. Consolidating what we know of geometric concepts allows us to make sense of and interact with our world. Geometric tools and methods can be used to solve problems relating to shape and space.	Patterns can often be generalized using algebraic expressions, equations or functions. Exponential notation is a powerful way to express repeated products of the same number.	infinitely in two directions. Fractions, decimal fractions and percentages are ways of representing whole-part relationships. For fractional and decimal computation, the ideas developed for whole-number computation can apply. Ratios are a comparison of two numbers or quantities.
Application of Concepts				
collect, display and interpret data in circle graphs (pie charts) and line graphs identify, describe and explain the range, mode, median and mean in a set of data set up a spreadsheet using simple formulas to manipulate data and to create graphs	develop and describe formulas for finding perimeter, area and volume use decimal and fraction notation in measurement, for example, 3.2 cm, 1.47 kg, 16 miles read and interpret scales on a range of measuring instruments measure and construct angles in	analyse, describe, classify and visualize 2D (including circles, triangles and quadrilaterals) and 3D shapes, using geometric vocabulary describe lines and angles using geometric vocabulary identify and use scale (ratios) to enlarge and reduce shapes	represent the rule of a pattern by using a function analyse pattern and function using words, tables and graphs, and, when possible, symbolic rules. select appropriate methods to analyse patterns and identify rules use functions to solve problems.	read, write, compare and order whole numbers up to millions or beyond read and write ratios read and write integers in appropriate contexts read and write exponents and square roots convert improper fractions to mixed numbers and vice versa

express probabilities using scale (0–1) or per cent (0%–100%). design a survey and systematically collect, record, organize and display the data in a bar graph, circle graph, line graph identify, describe and explain the range, mode, median and mean in a set of data create and manipulate an electronic database for their own purposes determine the theoretical probability of an event and explain why it might differ from experimental probability.	degrees using a protractor carry out simple unit conversions within a system of measurement (metric or customary). select and use appropriate units of measurement and tools to solve problems in real-life situations determine and justify the level of accuracy required to solve real-life problems involving measurement use decimal and fractional notation in measurement, for example, 3.2 cm, 1.47 kg, 16 miles use timetables and schedules (12-hour and 24-hour clocks) in real-life situations determine times worldwide.	identify and use the language and notation of bearing to describe direction and position create and model how a 2D net converts into a 3D shape and vice versa explore the use of geometric ideas and relationships to solve problems in other areas of mathematics. use geometric vocabulary when describing shape and space in mathematical situations and beyond use scale (ratios) to enlarge and reduce shapes apply the language and notation of bearing to describe direction and position use 2D representations of 3D objects		simplify fractions in mental and written form read, write, compare and order decimal fractions to thousandths or beyond read, write, compare and order percentages convert between fractions, decimals and percentages. use whole numbers up to millions or beyond in real-life situations use ratios in real-life situations use integers in real-life situations convert improper fractions to mixed numbers and vice versa in real-life situations simplify fractions in computation answers use fractions, decimals and

		to visualize and solve problems, for example using drawings or models.		percentages interchangeably in reallife situations select and use an appropriate sequence of operations to solve word problems select an efficient method for solving a problem: mental estimation, mental computation, written algorithms, by using a calculator use strategies to evaluate the reasonableness of answers use mental and written strategies for adding, subtracting, multiplying and dividing fractions and decimals in real-life situations estimate and make approximations in real-life situations involving fractions, decimals and percentages.

Learning outcomes				
graphs have special purposes understand that the mode, median, mean and range can summarize a set of data understand that probability can be expressed in scale (0–1) or per cent (0%–100%) understand the difference between experimental	understand procedures for finding area, perimeter and volume understand the relationships between area and perimeter, between area and volume, and between volume and capacity understand unit conversions within measurement systems (metric or customary).	understand the common language used to describe shapes understand the properties of regular and irregular polyhedra understand the properties of circles understand how scale (ratios) is used to enlarge and reduce shapes understand systems for describing position and direction understand that 2D representations of 3D objects can be used to visualize and solve problems understand that geometric ideas and relationships can be used to solve problems in other areas of mathematics and in real life.	understand that patterns can be generalized by a rule understand exponents as repeated multiplication understand the inverse relationship between exponents and roots understand that patterns can be represented, analysed and generalized using tables, graphs, words, and, when possible, symbolic rules.	model numbers to millions or beyond using the base 10 place value system model ratios model integers in appropriate contexts model exponents and square roots model improper fractions and mixed numbers simplify fractions using manipulatives model decimal fractions to thousandths or beyond model percentages understand the relationship between fractions, decimals and percentages model addition, subtraction, multiplication and division of fractions model addition, subtraction, multiplication and division of decimals.

COMMON CORE STANDARDS				