Structure of the domain

The Mathematics domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and a set of standards organised by dimension.

Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Mathematics, standards for assessing and reporting on student achievement apply from Level 1. Standards for Structure are introduced from Level 3.

Level 1

Learning focus

As students work towards the achievement of Level 1 standards in Mathematics, they manipulate and play with objects to develop links between their immediate environment, everyday language and mathematical activity.

In Number, students manipulate and group physical objects and drawings to develop basic understanding of the concepts of number and numerals. They group objects into sets (collections) and form simple correspondences (relations) between two sets; for example, in sharing pencils among students. They learn to count the number of objects up to 20 and relate the number counted to the use of a numeral. They describe and place objects in order such as first, second and third. They model addition by putting groups of objects together and counting the combined set and they model subtraction by moving apart groups of objects.
In *Space*, students manipulate and investigate the properties of basic two-and three-dimensional shapes. They use everyday objects and drawings to identify and describe points, lines, edges and surfaces. They recognise inside and outside. They participate in activities in which they create and follow simple verbal instructions to locate items in the classroom and immediate environment.

In *Measurement, chance and data*, students learn to compare common objects using terms such as *longer, heavier, fuller* and *hotter*. They begin to make estimates and simple measurements using informal units such as a number of paper clips in a length. In playing games of chance, students begin to recognise the unpredictability and uncertainty of events such as the roll of a die. They investigate situations requiring data collection and presentation in simple displays such as a pictogram of family pets.

When *Working mathematically*, students undertake activities and play to develop skills in making correspondences (for example, games such as Memory and activities such as matching students with their birth months). They create and explore number patterns using counters or other objects. They take risks by making and exploring conjectures relating to numbers, patterns, shapes and measurements (for example, ‘the bigger the object the heavier it is’ or ‘the next shape in a sequence will be …’). Students work with calculators to check the results of simple addition and subtraction. They draw and copy simple shapes and patterns by hand and also by using a computer drawing package.

**Standards**

**Number**

At Level 1, students form small sets of objects from simple descriptions and make simple correspondences between those sets. They count the size of small sets using the numbers 0 to 20. They use one-to-one correspondence to identify when two sets are equal in size and when one set is larger than another. They form collections of sets of equal size. They use ordinal numbers to describe the position of elements in a set from first to tenth. They use materials to model addition and subtraction by the aggregation (grouping together) and disaggregation (moving apart) of objects. They add and subtract by counting forward and backward using the numbers from 0 to 20.

**Space**

At Level 1, students recognise, copy and draw points, lines and simple freehand curves. They identify basic two-dimensional shapes such as triangles, circles and squares and three-dimensional solids and objects such as boxes and balls. They recognise the interior and
exterior of shapes and objects. They sort geometric objects according to simple descriptions. They place and orientate shapes according to simple descriptions such as next to, beside, in front of, behind, over and under. They develop and follow simple instructions to move and place shapes and objects in familiar situations in relation to what they can see, and to move themselves from one place to another.

**Measurement, chance and data**

At Level 1, students compare length, area, capacity and mass of familiar objects using descriptive terms such as longer, taller, larger, holds more and heavier. They make measurements using informal units such as paces for length, handprints for area, glasses for capacity, and bricks for weight. They recognise the continuity of time and the natural cycles such as day/night and the seasons. They correctly sequence days of the week. They use informal units such as heartbeats and hand claps at regular intervals to measure and describe the passage of time. They recognise and respond to unpredictability and variability in events, such as getting or not getting a certain number on the roll of a die in a game or the outcome of a coin toss. They collect and display data related to their own activities using simple pictographs.

**Working mathematically**

At Level 1, students use diagrams and materials to investigate mathematical and real life situations. They explore patterns in number and space by manipulating objects according to simple rules (for example, turning letters to make patterns like bqbqbq, or flipping to make bdldbdbd). They test simple conjectures such as ‘nine is four more than five’. They make rough estimates and check their work with respect to computations and construction in Number, Space, and Measurement, chance and data. They devise and follow ways of recording computations using the digit keys and +, × and = keys on a four function calculator. They use drawing tools such as simple shape templates and geometry software to draw points, lines, shapes and simple patterns. They copy a picture of a simple composite shape such as a child’s sketch of a house. In Mathematics, standards for the Structure dimension are introduced at Level 3.

**Level 2**

**Learning focus**
As students work towards the achievement of Level 2 standards in Mathematics, they begin to use mathematical symbols and language to describe their mathematical explorations of daily life.

In *Number*, students learn to use base 10 models (units, longs, flats and cubes) and arrays to identify, order and model the counting numbers up to 1000. They create number patterns mentally, by hand and with the use of the constant addition facility of calculators. They use models and arrays to support the development of skip counting up to 100. They recognise patterns created by skip counting (for example, when counting by fours, the pattern of the ones digits is 4, 8, 2, 6, 0, 4, 8). Students perform simple addition (count on) and subtraction (count back) using numbers up to 100. They use equal groups of objects and rectangular arrays to model multiplication and equal sharing for division. Students divide geometric objects including lines, arrays and regular shapes into equal parts to develop the concept of a simple fraction as part of a whole. They learn to order money amounts in dollars and cents, form different totals using dollars and cents, and carry out simple calculations such as change from small amounts.

In *Space*, students participate in activities which focus on identification of key features of shapes and solids. They learn to name familiar two- and three-dimensional shapes. They draw simple two-dimensional shapes, and visualise and describe the effect of transformations (for example, slides, flips and turns). They use mirrors and folding to investigate symmetry of shapes. Students learn to construct and follow directions, informal maps, diagrams and routes to locations in the local environment.

In *Measurement, chance and data*, students learn to use both non-uniform (for example, hand-spans) and uniform (for example, pencil length) informal measurement units. They recognise time units (second, minute, hour, day, week, and month) and investigate basic time patterns and cycles. They learn to tell the time using analogue and digital clocks.

Students pose and respond to questions leading to data collection. They use pictographs and bar graphs to organise and present data. They play games of chance to recognise and quantitatively describe the variability of outcomes. They use terms such as unlikely and almost certain, more likely and less likely to describe everyday chance events.

When *Working mathematically*, students learn to use a combination of everyday language and mathematical statements and symbols to describe their manipulation and play with sets of numbers, shapes, objects and patterns. They model and describe daily activities and familiar events using physical materials, diagrams and maps (for example, use a 1–1 graph to show attendance at class). Students test the truth of conjectures by attempting to find examples or counter-examples, and exploring special cases. They develop and consolidate their understanding of the commutative and associative properties for addition and multiplication.
They learn to use a calculator to check estimations, computations and solutions to simple number sentences and equations.

**Standards**

**Number**

At Level 2, students model the place value of the natural numbers from 0 to 1000. They order numbers and count to 1000 by 1s, 10s and 100s. Students skip count by 2s, 4s and 5s from 0 to 100 starting from any natural number. They form patterns and sets of numbers based on simple criteria such as odd and even numbers. They order money amounts in dollars and cents and carry out simple money calculations. They describe simple fractions such as one half, one third and one quarter in terms of equal sized parts of a whole object, such as a quarter of a pizza, and subsets such as half of a set of 20 coloured pencils. They add and subtract one- and two-digit numbers by counting on and counting back. They mentally compute simple addition and subtraction calculations involving one- or two-digit natural numbers, using number facts such as complement to 10, doubles and near doubles. They describe and calculate simple multiplication as repeated addition, such as $3 \times 5 = 5 + 5 + 5$; and division as sharing, such as 8 shared between 4. They use commutative and associative properties of addition and multiplication in mental computation (for example, $3 + 4 = 4 + 3$ and $3 + 4 + 5$ can be done as $7 + 5$ or $3 + 9$).

**Space**

At Level 2, students recognise lines, surfaces and planes, corners and boundaries; familiar two-dimensional shapes including rectangles, rhombuses and hexagons, and three-dimensional shapes and objects including pyramids, cones, and cylinders. They arrange a collection of geometric shapes, such as a set of attribute blocks, into subsets according to simple criteria, and recognise when one set of shapes is a subset of another set of shapes. They recognise and describe symmetry, asymmetry, and congruence in these shapes and objects. They accurately draw simple two-dimensional shapes by hand and construct, copy and combine these shapes using drawing tools and geometry software. They apply simple transformations to shapes (flips, turns, slides and enlargements) and depict both the original and transformed shape together. They specify location as a relative position, including left and right, and interpret simple networks, diagrams and maps involving a small number of points, objects or locations.

**Measurement, chance and data**

At Level 2, students make, describe and compare measurements of length, area, volume, mass and time using informal units. They recognise the differences between non-uniform measures, such as hand-spans, to measure length, and uniform measures, such as icy-pole
sticks. They judge relative capacity of familiar objects and containers by eye and make informal comparisons of weight by hefting. They describe temperature using qualitative terms (for example, cold, warm, hot). Students use formal units such as hour and minute for time, litre for capacity and the standard units of metres, kilograms and seconds.

Students recognise the key elements of the calendar and place in sequence days, weeks and months. They describe common and familiar time patterns and such as the time, duration and day of regular sport training and tell the time at hours and half-hours using an analogue clock, and to hours and minutes using a digital clock. Students predict the outcome of chance events, such as the rolling of a die, using qualitative terms such as certain, likely, unlikely and impossible. They collect simple categorical and numerical data (count of frequency) and present this data using pictographs and simple bar graphs.

**Working mathematically**

At Level 2, students make and test simple conjectures by finding examples, counter-examples and special cases and informally decide whether a conjecture is likely to be true. They use place value to enter and read displayed numbers on a calculator. They use a four-function calculator, including use of the constant addition function and x key, to check the accuracy of mental and written estimations and approximations and solutions to simple number sentences and equations. In Mathematics, standards for the *Structure* dimension are introduced at Level 3.

**Level 3**

**Learning focus**

As students work towards the achievement of Level 3 standards in Mathematics, they recognise and explore patterns in numbers and shapes. They increasingly use mathematical terms and symbols to describe computations, measurements and characteristics of objects.

In *Number*, students use structured materials to explore place value and order of numbers to tens of thousands. They skip count to create number patterns. They use materials to develop concepts of decimals to hundredths. They use suitable fraction material to develop concepts of equivalent fractions and to compare fraction sizes. They apply number skills to everyday
contexts such as shopping. They extend addition and subtraction computations to three digit numbers. They learn to multiply and divide by single digit numbers.

In Space, students sort lines, shapes and solids according to key features. They use nets to create three-dimensional shapes and explore them by counting edges, faces and vertices. They visualise and draw simple solids as they appear from different positions. They investigate simple transformations (reflections, slides and turns) to create tessellations and designs. They explore the concept of angle as turn (for example, using clock hands). They use grid references (for example, A5 on a street directory) to specify location and compass bearings to describe directions. They use local and larger-scale maps to locate places and describe suitable routes between them.

In Measurement, chance and data, students measure the attributes of everyday objects and events using formal (for example, metres and centimetres) and informal units (for example, pencil lengths). Students tell the time using analogue and digital clocks and relate familiar activities to the calendar. Students investigate natural variability in chance events and order them from least likely to most likely. Students conduct experiments and collect data to construct simple frequency graphs. They use simple two-way tables (karnaugh maps) to sort non-numerical data.

In Structure, students use structured material (in tens, hundreds and thousands) to develop ideas about multiplication by replication and division by sharing. They recognise the possibility of remainders when dividing. They learn to use number properties to support computations (for example, they use the commutative and associative properties for adding or multiplying three numbers in any order or combination). They investigate the distributive property to develop methods of multiplication and division by single digit whole numbers. They learn to use and describe simple algorithms for computations. They use simple rules to generate number patterns (for example, ‘the next term in the sequence is two more than the previous term’). They create and complete number sentences using whole numbers, decimals and fractions.

When Working mathematically, students use mathematical symbols (for example, brackets, division and inequality, the words and, or and not). Students develop and test ideas (conjectures) across the content of mathematical experience. For example:

• in Number, the size and type of numbers resulting from computations

• in Space, the effects of transformations of shapes

• in Measurement, chance and data, the outcomes of random experiments and inferences from collected samples.
Students learn to recognise practical applications of mathematics in daily life, including shopping, travel and time of day. They identify the mathematical nature of problems for investigation. They choose and use learned facts, procedures and strategies to find solutions. They use a range of tools for mathematical work, including calculators, computer drawing packages and measuring tools.

Standards

Number

At Level 3, students use place value (as the idea that ‘ten of these is one of those’) to determine the size and order of whole numbers to tens of thousands, and decimals to hundredths. They round numbers up and down to the nearest unit, ten, hundred, or thousand. They develop fraction notation and compare simple common fractions such as $\frac{3}{4} > \frac{2}{3}$ using physical models. They skip count forwards and backwards, from various starting points using multiples of 2, 3, 4, 5, 10 and 100. They estimate the results of computations and recognise whether these are likely to be over-estimates or under-estimates. They compute with numbers up to 30 using all four operations. They provide automatic recall of multiplication facts up to $10 \times 10$.

They devise and use written methods for:

- whole number problems of addition and subtraction involving numbers up to 999
- multiplication by single digits (using recall of multiplication tables) and multiples and powers of ten (for example, $5 \times 100$, $5 \times 70$)
- division by a single-digit divisor (based on inverse relations in multiplication tables).

They devise and use algorithms for the addition and subtraction of numbers to two decimal places, including situations involving money. They add and subtract simple common fractions with the assistance of physical models.

Space

At Level 3, students recognise and describe the directions of lines as vertical, horizontal or diagonal. They recognise angles are the result of rotation of lines with a common end-point. They recognise and describe polygons. They recognise and name common three-dimensional shapes such as spheres, prisms and pyramids. They identify edges, vertices and faces. They use two-dimensional nets, cross-sections and simple projections to represent simple three-
dimensional shapes. They follow instructions to produce simple tessellations (for example, with triangles, rectangles, hexagons) and puzzles such as tangrams. They locate and identify places on maps and diagrams. They give travel directions and describe positions using simple compass directions (for example, N for North) and grid references on a street directory.

Measurement, chance and data

At Level 3, students estimate and measure length, area, volume, capacity, mass and time using appropriate instruments. They recognise and use different units of measurement including informal (for example, paces), formal (for example, centimetres) and standard metric measures (for example, metre) in appropriate contexts. They read linear scales (for example, tape measures) and circular scales (for example, bathroom scales) in measurement contexts. They read digital time displays and analogue clock times at five-minute intervals. They interpret timetables and calendars in relation to familiar events. They compare the likelihood of everyday events (for example, the chances of rain and snow). They describe the fairness of events in qualitative terms. They plan and conduct chance experiments (for example, using colours on a spinner) and display the results of these experiments. They recognise different types of data: non-numerical (categories), separate numbers (discrete), or points on an unbroken number line (continuous). They use a column or bar graph to display the results of an experiment (for example, the frequencies of possible categories).

Structure

At Level 3, students recognise that the sharing of a collection into equal-sized parts (division) frequently leaves a remainder. They investigate sequences of decimal numbers generated using multiplication or division by 10. They understand the meaning of the ‘=” in mathematical statements and technology displays (for example, to indicate either the result of a computation or equivalence). They use number properties in combination to facilitate computations (for example, 7 + 10 + 13 = 10 + 7 + 13 = 10 + 20).

They multiply using the distributive property of multiplication over addition (for example, 13 \times 5 = (10 + 3) \times 5 = 10 \times 5 + 3 \times 5). They list all possible outcomes of a simple chance event. They use lists, Venn diagrams and grids to show the possible combinations of two attributes. They recognise samples as subsets of the population under consideration (for example, pets owned by class members as a subset of pets owned by all children). They construct number sentences with missing numbers and solve them.

Working mathematically

At Level 3, students apply number skills to everyday contexts such as shopping, with appropriate rounding to the nearest five cents. They recognise the mathematical structure of problems and use appropriate strategies (for example, recognition of sameness, difference
and repetition) to find solutions. Students test the truth of mathematical statements and
generalisations. For example, in:

• number (which shapes can be easily used to show fractions)
• computations (whether products will be odd or even, the patterns of remainders from
division)
• number patterns (the patterns of ones digits of multiples, terminating or repeating decimals
resulting from division)
• shape properties (which shapes have symmetry, which solids can be stacked)
• transformations (the effects of slides, reflections and turns on a shape)
• measurement (the relationship between size and capacity of a container).

Students use calculators to explore number patterns and check the accuracy of estimations.
They use a variety of computer software to create diagrams, shapes, tessellations and to
organise and present data.

Level 4

Learning focus

As students work towards the achievement of Level 4 standards in Mathematics, they
describe their investigations with correct mathematical terms, symbols and notations. They
use mathematical procedures to construct and systematically investigate conjectures or
hypotheses.

In *Number*, students extend their understanding of whole numbers, fractions and decimals.
They use patterns and arrays to develop understanding of multiples (including lowest
common multiple), factors (including highest common factor), prime and composite
numbers. They recognise and use simple powers (for example, $2^3 = 8$). Students investigate
and use equivalent forms of common fractions. They order fractions and decimals and locate
them on a number line. They investigate temperature and other contexts to develop the
concept of negative numbers. They explore ideas of ratio (as a comparison) and percentage
(comparing to 100). They use materials to explore decimals, ratios and percentages as
equivalent forms of fractions (for example, $1/2 = 0.5 = 50\% = 1 : 2$).
Students devise and use mental and written methods (algorithms) to add, subtract, multiply and divide whole numbers. For division they recognise remainders as common fractions or decimals. They devise and use mental and written methods to add and subtract decimals. They use materials and number lines to develop understanding of multiplication and division of decimals (to two decimal places) and simple common fractions. They routinely make estimations and approximations in calculations and make judgments about their accuracy.

In Space, students identify and sort shapes by properties such as parallel and perpendicular lines (for example, quadrilaterals). They use the ideas of angle, size and scale to describe the features of shapes and solids. They identify symmetry by reflection or rotation. They create and compare pairs of enlarged shapes using simple scale factors. They describe the features that change (for example, side lengths) and features that remain the same (for example, angles). They represent solids (for example, prisms, pyramids, cylinders and cones) as two-dimensional drawings and nets. They visualise and describe relative location and routes between places shown on a map. They create and interpret simple networks such as a road network to show connectedness between towns.

In Measurement, chance and data, students estimate and measure lengths (including perimeter), area (including surface area), volumes, capacity, time (including duration), and temperature in metric units using appropriate instruments and scales. They determine and use the level of accuracy required for the purpose of the measurement. They develop simple procedures to determine the perimeter and area of simple shapes (for example, counting squares in a grid to determine area). Students estimate and describe the chance of random events using words, percentages and fractions or decimals between 0 and 1. They investigate the sample space (possible outcomes) for simple chance events and calculate theoretical probability. They explain how symmetry in chance situations (for example, the roll of a die) creates equally likely outcomes. They create simulations of chance events to estimate probability (for example, randomly selecting a card from a pack without kings to choose a month).

Students plan and conduct questionnaires to collect data for a specific purpose. They recognise different data types such as categorical and numerical, discrete and continuous. They organise and present grouped and ungrouped data using displays such as simple frequency tables and histograms. They calculate and interpret measures of centre (mean, median and mode) and spread (range) for ungrouped data.

In Structure, students use venn diagrams and tables (karnaugh maps) to test the validity of statements involving the quantifiers none, some and all. They develop algorithms involving words, diagrams and mathematical symbols (for example, for testing the divisibility of a number). Students create number sequences by computing the next term from the previous term or terms (recursion). They develop function rules for the terms in
sequences based on their position in the sequence. Students recognise that the ‘identity’ for each operation has no effect: the number 0 for addition and subtraction, and 1 for multiplication and division. They form and solve equations using words and symbols.

When *Working mathematically*, students make and test conjectures and generalisations about numbers, shapes and mathematical structure using concrete materials and diagrams. For example:

- in *Number*, the factors of primes and composites
- in *Space*, the properties of shapes
- in *Measurement, chance and data*, the probability of outcomes in games of chance
- in *Structure*, the patterns of remainders formed by division.

Students identify and investigate real life, practical and historical applications of mathematics. They pose and solve mathematical problems using a range of strategies (for example, make a list, find a pattern, work backwards). They solve new problems based on familiar problem structures. Students develop and use estimation procedures to check the results of computations made using technology. They use technology for complex and extended computations. They use appropriate technology to explore puzzles involving numbers (for example, solve a magic square using a spreadsheet) and to generate drawings of shapes, solids, nets and geometric designs.

**Standards**

**Number**

At Level 4, students comprehend the size and order of small numbers (to thousandths) and large numbers (to millions). They model integers (positive and negative whole numbers and zero), common fractions and decimals. They place integers, decimals and common fractions on a number line. They create sets of number multiples to find the lowest common multiple of the numbers. They interpret numbers and their factors in terms of the area and dimensions of rectangular arrays (for example, the factors of 12 can be found by making rectangles of dimensions $1 \times 12$, $2 \times 6$, and $3 \times 4$). Students identify square, prime and composite numbers. They create factor sets (for example, using factor trees) and identify the highest common factor of two or more numbers. They recognise and calculate simple powers of whole numbers (for example, $2^4 = 16$). Students use decimals, ratios and percentages to find equivalent representations of common fractions (for example, $3/4 = 9/12 = 0.75 = 75\% = 3 : 4 = 6 : 8$). They explain and use mental and written algorithms for the addition, subtraction, multiplication and division of natural numbers (positive whole numbers). They add, subtract,
and multiply fractions and decimals (to two decimal places) and apply these operations in practical contexts, including the use of money. They use estimates for computations and apply criteria to determine if estimates are reasonable or not.

**Space**

At Level 4, students classify and sort shapes and solids (for example, prisms, pyramids, cylinders and cones) using the properties of lines (orientation and size), angles (less than, equal to, or greater than 90°), and surfaces. They create two-dimensional representations of three dimensional shapes and objects found in the surrounding environment. They develop and follow instructions to draw shapes and nets of solids using simple scale. They describe the features of shapes and solids that remain the same (for example, angles) or change (for example, surface area) when a shape is enlarged or reduced. They apply a range of transformations to shapes and create tessellations using tools (for example, computer software).

Students use the ideas of size, scale, and direction to describe relative location and objects in maps. They use compass directions, coordinates, scale and distance, and conventional symbols to describe routes between places shown on maps. Students use network diagrams to show relationships and connectedness such as a family tree and the shortest path between towns on a map.

**Measurement, chance and data**

At Level 4, students use metric units to estimate and measure length, perimeter, area, surface area, mass, volume, capacity time and temperature. They measure angles in degrees. They measure as accurately as needed for the purpose of the activity. They convert between metric units of length, capacity and time (for example, L–mL, sec–min).

Students describe and calculate probabilities using words, and fractions and decimals between 0 and 1. They calculate probabilities for chance outcomes (for example, using spinners) and use the symmetry properties of equally likely outcomes. They simulate chance events (for example, the chance that a family has three girls in a row) and understand that experimental estimates of probabilities converge to the theoretical probability in the long run.

Students recognise and give consideration to different data types in forming questionnaires and sampling. They distinguish between categorical and numerical data and classify numerical data as discrete (from counting) or continuous (from measurement). They present data in appropriate displays (for example, a pie chart for eye colour data and a histogram for grouped data of student heights). They calculate and interpret measures of centrality (mean, median, and mode) and data spread (range).
Structure

At Level 4 students form and specify sets of numbers, shapes and objects according to given criteria and conditions (for example, 6, 12, 18, 24 are the even numbers less than 30 that are also multiples of three). They use venn diagrams and karnaugh maps to test the validity of statements using the words none, some or all (for example, test the statement ‘all the multiples of 3, less than 30, are even numbers’). Students construct and use rules for sequences based on the previous term, recursion (for example, the next term is three times the last term plus two), and by formula (for example, a term is three times its position in the sequence plus two).

Students establish equivalence relationships between mathematical expressions using properties such as the distributive property for multiplication over addition (for example, \(3 \times 26 = 3 \times (20 + 6)\)). Students identify relationships between variables and describe them with language and words (for example, how hunger varies with time of the day).

Students recognise that addition and subtraction, and multiplication and division are inverse operations. They use words and symbols to form simple equations. They solve equations by trial and error.

Working mathematically

At Level 4, use students recognise and investigate the use of mathematics in real (for example, determination of test results as a percentage) and historical situations (for example, the emergence of negative numbers). Students develop and test conjectures. They understand that a few successful examples are not sufficient proof and recognise that a single counter-example is sufficient to invalidate a conjecture. For example, in:

- number (all numbers can be shown as a rectangular array)
- computations (multiplication leads to a larger number)
- number patterns (the next number in the sequence 2, 4, 6 … must be 8)
- shape properties (all parallelograms are rectangles)
- chance (a six is harder to roll on die than a one).

Students use the mathematical structure of problems to choose strategies for solutions. They explain their reasoning and procedures and interpret solutions. They create new problems based on familiar problem structures. Students engage in investigations involving mathematical modelling. They use calculators and computers to investigate and implement algorithms (for example, for finding the lowest common multiple of two numbers), explore number facts and puzzles, generate simulations (for example, the gender of children in a family of four children), and transform shapes and solids.