|  |
| --- |
| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Number and Algebra *toward* Foundation Level Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* finger count different sets of objects, such as one-two-three, identify different numbers of fingers being displayed on one and two hands, explore different finger counting systems throughout the ages and in various societies,
* visually identify the size of small sets of objects without counting for ‘two’, ‘three’ and ‘four’ such as in variants of Kim’s game, nd group together sets with the same number of elements
* Create tables for number names, numerals and symbols from one to ten, considering different languages, cultures and contexts, including indigenous Australian languages
* create simple alternating visual patterns such as: 🞎 ⭘ 🞎 ⭘ 🞎 ⭘ … using concrete materials, cards and technology

**Content Descriptions:**Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from  any starting point [(VCMNA069)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA069)Sort and classify familiar objects and explain the basis for these classifications, and copy, continue and create patterns with objects and drawings [(VCMNA076)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA076)Follow a short sequence of instructions [(VCMNA077)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA077) |
| **Example of Indicative Progress toward Foundation Level Achievement Standard** | **Mathematics Foundation Level Achievement Standard** |
| In **Mathematics**, indicative progression towards the Foundation Level achievement standard may be when students:* finger count up to ten
* recognise a simple alternating pattern with two different objects
* identify sets of the same size using one-to-one correspondence of their elements
 | By the end of Level 1:**Number and Algebra**Students connect number names and numerals with sets of up to 20 elements, estimate the size of these sets, and use counting strategies to solve problems that involve comparing, combining and separating these sets. They match individual objects with counting sequences up to and back from 20. Students order the first 10 elements of a set. They represent, continue and create simple patterns. |

|  |
| --- |
| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics: Number and Algebra *toward* Level 1 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* use a model of an object such as a pizza cut into equal sized pieces and shared with a friend, construct different models for one-half by partitioning sets or objects into two eual parts
* construct ‘scratch-mark’ counting sequences such as | || ||| |||| … and relate these to various artifacts
* count the number of elements in a range of different sets of objects using pairs and tallies of fives, use counting by pairs to count piles of small objects such as 5 cent coins
* create patterns using numbers, objects or symbols such as a repeating sequence of images: 🖐 ☺☺ 🖐 ☺☺ 🖐 ☺☺ …

**Content Descriptions:**Recognise and describe one-half as one of two equal parts of a whole (VCMNA091)Investigate and describe number patterns formed by skip counting and patterns with objects [(VCMNA093)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA093)Recognise the importance of repetition of a process in solving problems (VCMNA094) |
|  | **Example of Indicative Progress toward Level 1 Achievement Standard** | **Mathematics Level 1 Achievement Standard** |
| By the end of the Foundation level:**Number and Algebra**Students connect number names and numerals with sets of up to 20 elements, estimate the size of these sets, and use counting strategies to solve problems that involve comparing, combining and separating these sets. They match individual objects with counting sequences up to and back from 20. Students order the first 10 elements of a set. They represent, continue and create simple patterns.  | In **Mathematics**, indicative progression towards the Level 1 achievement standard may be when students:* share an object or sets of objects equally between two people
* count a set of objects ‘two at a time’ to keep a running total: two, four, six …
 | By the end of Level 1:**Number and Algebra**Students count to and from 100 and locate these numbers on a number line. They partition numbers using place value and carry out simple additions and subtractions, using counting strategies. Students recognise Australian coins according to their value. They identify representations of one half. Students describe number sequences resulting from skip counting by 2s, 5s and 10s. They continue simple patterns involving numbers and objects with and without the use of digital technology. |

|  |
| --- |
| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics Number and Algebra *toward* Level 2 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* discuss different number names for one, two and three such as unit, single, couple, brace, yoke, pair, duo, twin, triad, triple, quartet and compare counting in different languages, including Australian indigenous languages, create related lists compare the words for cardinal (size) and ordinal (position) numbers
* use various equivalent sums of numbers such as 2 + 3 = 4 + 1 = 1 + 1 + 1 + 1 +1 , and form compositions of these using counters
* determine total number of tiles in floor patterns such as 5 rows of 3 tiles = 3 + 3 + 3 + 3 + 3 = 15 = 5 lots of 3.

**Content Descriptions:**Recognise, model, represent and order numbers to at least 1000 [(VCMNA104)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA104)Describe patterns with numbers and identify missing elements [(VCMNA112)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA112)Apply repetition in arithmetic operations, including multiplication as repeated addition and division as repeated subtraction (VCMNA114) |
| **Mathematics Level 1 Achievement Standard**  | **Example of Indicative Progress toward Level 2 Achievement Standard** | **Mathematics Level 2 Achievement Standard** |
| By the end of Level 1:**Number and Algebra**Students count to and from 100 and locate these numbers on a number line. They partition numbers using place value and carry out simple additions and subtractions, using counting strategies. Students recognise Australian coins according to their value. They identify representations of one half. Students describe number sequences resulting from skip counting by 2s, 5s and 10s. They continue simple patterns involving numbers and objects with and without the use of digital technology. | In **Mathematics**, indicative progression towards the Level 2 achievement standard may be when students:* write the same number in different ways as a sum of several other numbers
* identify a missing number in a count
* represent multiplication problems in context with diagrams and solve them by repeated addition
 | By the end of Level 2:**Number and Algebra**Students count to and from, and order numbers up to 1000. They perform simple addition and subtraction calculations, using a range of strategies. They find the total value of simple collections of Australian notes and coins. Students represent multiplication and division by grouping into sets and divide collections and shapes into halves, quarters and eighths. They recognise increasing and decreasing number sequences involving 2s, 3s, 5s and 10s, identify the missing element in a number sequence, and use digital technology to produce sequences by constant addition.  |

|  |
| --- |
| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics Number and Algebra *toward* Level 3 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* create a 2 × table using counting by 2’s
* explore halving as the opposite of doubling and show that halving, sharing between two people and counting the number of sets of 2 give the same result
* explore the interactive use of simple function machines

**Content Descriptions:**Recall multiplication facts of two, three, five and ten and related division facts (VCMNA134)Describe, continue, and create number patterns resulting from performing addition or subtraction [(VCMNA138)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA138)Use a function machine and the inverse machine as a model to apply mathematical rules to numbers or shapes(VCMNA139) |
| **Mathematics Level 2 Achievement Standard**  | **Example of Indicative Progress toward Level 3 Achievement Standard** | **Mathematics Level 3 Achievement Standard** |
| By the end of Level 2:**Number and Algebra**Students count to and from, and order numbers up to 1000. They perform simple addition and subtraction calculations, using a range of strategies. They find the total value of simple collections of Australian notes and coins. Students represent multiplication and division by grouping into sets and divide collections and shapes into halves, quarters and eighths. They recognise increasing and decreasing number sequences involving 2s, 3s, 5s and 10s, identify the missing element in a number sequence, and use digital technology to produce sequences by constant addition.  | In **Mathematics**, indicative progression towards the Level 3 achievement standard may be when students:* recall multiplication facts for 2 and 10 and explore the connection between division by 2 and halving.
* Write out ‘the next three terms’ in number patterns based on a decrease by a fixed amount
* use a function machine to generate a sequence based on multiples
 | By the end of Level 3:**Number and Algebra**Students count and order numbers to and from 10 000. They recognise the connection between addition and subtraction, and solve problems using efficient strategies for multiplication with and without the use of digital technology. Students recall addition and multiplication facts for single-digit numbers. They represent money values in various ways and correctly count out change from financial transactions. Students model and represent unit fractions for halves, thirds, quarters, fifths and eighths, and multiples of these up to one. They classify numbers as either odd or even, continue number patterns involving addition or subtraction, and explore simple number sequences based on multiples. |

|  |
| --- |
| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics Number and Algebra *toward* Level 4 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* model the relationship between repeated addition and multiplication using rectangular arrays
* formulate and solve a variety of problems involving multiplication of single digit numbers *a* and *b* such that $a×b=c $where any one of *a*, *b* or *c* is not known and *c* is a one or two digit number
* complete a fraction wall for halves, quarters and sixths for up to 3 units, and show how 4 quarters = 1 and 12 sixths = 2 and so on.
* describe an algorithm for ordering or sorting a set of numbers or an arithmetic operation.

**Content Descriptions:**Recall multiplication facts up to 10 × 10 and related division facts [(VCMNA155)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA155)Use equivalent number sentences involving addition and subtraction to find unknown quantities [(VCMNA163)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA163)Define a simple class of problems and use an effective algorithm that involves a short sequence of steps and decisions to solve them(VCMNA164) |
| **Mathematics Level 3 Achievement Standard**  | **Example of Indicative Progress toward Level 4 Achievement Standard** | **Mathematics Level 4 Achievement Standard** |
| By the end of Level 3:**Number and Algebra**Students count and order numbers to and from 10 000. They recognise the connection between addition and subtraction, and solve problems using efficient strategies for multiplication with and without the use of digital technology. Students recall addition and multiplication facts for single-digit numbers. They represent money values in various ways and correctly count out change from financial transactions. Students model and represent unit fractions for halves, thirds, quarters, fifths and eighths, and multiples of these up to one. They classify numbers as either odd or even, continue number patterns involving addition or subtraction, and explore simple number sequences based on multiples. | In **Mathematics** indicative progression towards the Level 4 achievement standard may be when students:* solve practical problems involving single digit multiplication
* write down number sequences based on multiples
* describe an algorithm for sorting a set of numbers into a set of odd numbers and a set of even numbers
 | By the end of Level 4:**Number and Algebra**Students recall multiplication facts to 10 x 10 and related division facts. They choose appropriate strategies for calculations involving multiplication and division, with and without the use of digital technology, and estimate answers accurately enough for the context. Students solve simple purchasing problems with and without the use of digital technology. They locate familiar fractions on a number line, recognise common equivalent fractions in familiar contexts and make connections between fractions and decimal notations up to two decimal places. Students identify unknown quantities in number sentences. They use the properties of odd and even numbers and describe number patterns resulting from multiplication. Students continue number sequences involving multiples of single-digit numbers and unit fractions, and locate them on a number line. |

|  |
| --- |
| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics Number and Algebra *toward* Level 5 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* demonstrate various written multiplication algorithms using data from realistic contexts
* add and subtract decimals up to two decimal places
* devise an algorithm for ordering decimal numbers

**Content Descriptions:**Use estimation and rounding to check the reasonableness of answers to calculations [(VCMNA182)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA182)Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction [(VCMNA192)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA192)Follow a mathematical algorithm involving branching and repetition (iteration) (VCMNA194) |
| **Mathematics Level 4 Achievement Standard**  | **Example of Indicative Progress toward Level 5 Achievement Standard** | **Mathematics Level 5 Achievement Standard** |
| By the end of Level 4:* Students recall multiplication facts to 10 x 10 and related division facts.
* They choose appropriate strategies for calculations involving multiplication and division, with and without the use of digital technology, and estimate answers accurately enough for the context.
* Students solve simple purchasing problems with and without the use of digital technology.
* They locate familiar fractions on a number line, recognise common equivalent fractions in familiar contexts and make connections between fractions and decimal notations up to two decimal places.
* Students identify unknown quantities in number sentences.
* They use the properties of odd and even numbers and describe number patterns resulting from multiplication.
* Students continue number sequences involving multiples of single-digit numbers and unit fractions, and locate them on a number line.
 | In **Mathematics**, indicative progression towards the Level 5 achievement standard may be when students:* solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies
* add and subtract simple fractions with the same denominator
* explore contexts involving ‘if’ ‘then’ situations and write them as both descriptive statements and as flow charts, such as ordering a set of decimal numbers

  | By the end of Level 5:* Students solve simple problems involving the four operations using a range of strategies including digital technology.
* They estimate to check the reasonableness of answers and approximate answers by rounding.
* Students identify and describe factors and multiples.
* They explain plans for simple budgets.
* Students order decimals and unit fractions and locate them on a number line.
* Students add and subtract fractions with the same denominator.
* They find unknown quantities in number sentences and continue patterns by adding or subtracting fractions and decimals.
 |

|  |
| --- |
| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics Number and Algebra *toward* Level 6 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* construct factor trees and investigate divisibility tests, such as ‘when is a number divisible by 3?’
* create patterns for the geometric numbers (triangular, square, hexagonal) and explore the distribution of these and prime numbers on a number line
* apply formulas defined using the four operations and brackets to solve practical problems
* express numbers in equivalent decimal, fraction and percentage forms, represent these on a number line and interpret percentages in context

**Content Descriptions:**Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies [(VCMNA218)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA218)Explore the use of brackets and order of operations to write number sentences [(VCMNA220)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA220)Design algorithms involving branching and iteration to solve specific classes of mathematical problems [(VCMNA221)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA221) |
| **Mathematics Level 5 Achievement Standard**  | **Example of Indicative Progress toward Level 6 Achievement Standard** | **Mathematics Level 6 Achievement Standard** |
| By the end of Level 5:* Students solve simple problems involving the four operations using a range of strategies including digital technology.
* They estimate to check the reasonableness of answers and approximate answers by rounding. Students identify and describe factors and multiples.
* They explain plans for simple budgets.
* Students order decimals and unit fractions and locate them on a number line.
* Students add and subtract fractions with the same denominator. They find unknown quantities in number sentences and continue patterns by adding or subtracting fractions and decimals.

  | In **Mathematics**, indicative progression towards the Level 6 achievement standard may be when students:* Solve problems for different rates of discount applied to various items for purchase, such as clothing or furniture
* solve practical problems involving multiple computations with mixed operations and brackets.
* apply an algorithm to determine which elements of a set of numbers are prime
 | By the end of Level 6:* Students recognise the properties of prime, composite, square and triangular numbers and determine sets of these numbers.
* They solve problems that involve all four operations with whole numbers and describe the use of integers in everyday contexts.
* Students locate fractions and integers on a number line and connect fractions, decimals and percentages as different representations of the same number.
* They solve problems involving the addition and subtraction of related fractions
* Students calculate a simple fraction of a quantity and calculate common percentage discounts on sale items, with and without the use of digital technology.
* They make connections between the powers of 10 and the multiplication and division of decimals.
* Students add, subtract and multiply decimals and divide decimals where the result is rational.
* Students write number sentences using brackets and order of operations, and specify rules used to generate sequences involving whole numbers, fractions and decimals.
* They use ordered pairs of integers to represent coordinates of points and locate a point in any one of the four quadrants on the Cartesian plane.
 |

|  |
| --- |
| Previous level’s achievement standard as a starting point of comparison Previous level’s achievement standard as a starting point of comparison **CURRICULUM AREA – Mathematics Number and Algebra *toward* Level 7 Achievement Standard** |
| **VCAA EXAMPLE****Context:**Students cover related content and proficiencies when they engage in learning activities where they:* create shapes in the plane by joining sets of points with line segments
* interpret and analyse graphs from real life data, such as water level in a dam over time
* develop algorithms for simple mathematical processes, such as converting between fractions, decimals and percentages using language, flowcharts and simple programs

**Content Descriptions:** Compare, order, add and subtract integers [(VCMNA241)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCMNA241)Explore the use of brackets and order of operations to write number sentences (VCMNA220)Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (VCMNA253)Design and implement mathematical algorithms using a simple general-purpose programming language (VCMNA254) |
|  | **Example of Indicative Progress toward Level 7 Achievement Standard** | **Mathematics Level 7 Achievement Standard** |
| By the end of Level 6:* Students recognise the properties of prime, composite, square and triangular numbers and determine sets of these numbers.
* They solve problems that involve all four operations with whole numbers and describe the use of integers in everyday contexts.
* Students locate fractions and integers on a number line and connect fractions, decimals and percentages as different representations of the same number.
* They solve problems involving the addition and subtraction of related fractions.
* Students calculate a simple fraction of a quantity and calculate common percentage discounts on sale items, with and without the use of digital technology.
* They make connections between the powers of 10 and the multiplication and division of decimals.
* Students add, subtract and multiply decimals and divide decimals where the result is rational.
* Students write number sentences using brackets and order of operations, and specify rules used to generate sequences involving whole numbers, fractions and decimals.
* They use ordered pairs of integers to represent coordinates of points and locate a point in any one of the four quadrants on the Cartesian plane.
 | In **Mathematics**, indicative progression towards the Level 7 achievement standard may be when students:* solve practical problems involving differences that are modeled by integers and integer operations
* plot points from tables of values involving real life bivariate numerical data
* Use structured English or pseudo-code to devise an algorithm for the addition of fractions implemented using a simple general purpose programming language
 | By the end of Level 7:* Students solve problems involving the order, addition and subtraction of integers.
* They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots.
* They solve problems involving all four operations with fractions, decimals, percentages and their equivalences, and express fractions in their simplest form.
* Students compare the cost of items to make financial decisions, with and without the use of digital technology.
* They make simple estimates to judge the reasonableness of results.
* Students use variables to represent arbitrary numbers and connect the laws and properties of number to algebra and substitute numbers into algebraic expressions.
* They assign ordered pairs to given points on the Cartesian plane and interpret and analyse graphs of relations from real data.
* Students develop simple linear models for situations, make predictions based on these models, solve related equations and check their solutions.
 |