Mathematics Level 8 map – example

**Use this curriculum area map to identify where content descriptions and achievement standards are explicitly addressed within your school’s teaching and learning plans. This template will help you to both map the Victorian Curriculum F–10 Version 2.0 and audit your current teaching and learning plans.**

# Instructions

1. Enter your details in the footer on page 1.
2. Enter the title of each teaching and learning unit in the first column of each mapping table. Indicate the connections to the curriculum by checking the box of the relevant content description(s) and writing the number of the relevant sentence(s) from the achievement standard.
3. Complete all the mapping tables, listing all teaching and learning units. Check that all achievement standard sentences have been covered. Detail any comments, notes and actions.
4. Complete the Assessment, Analysis of Curriculum Coverage and Next Steps sections on the final page(s).

**Hint:** Use your completed curriculum area map to start populating or updating your **curriculum area plan**.

|  |  |
| --- | --- |
| **Achievement standard (AS) paragraph for Number strand, with numbered sentences** | **Y/N** |
| 1. By the end of Level 8, students recognise irrational numbers as numbers that cannot develop from the division of integer values by natural numbers and terminating or recurring decimals.
 |[x]
| 1. They apply the exponent laws to calculations with numbers involving positive integer exponents.
 |[x]
| 1. Students solve problems involving the 4 operations with integers and positive rational numbers.
 |[x]
| 1. They use mathematical modelling to solve practical problems involving ratios, percentages and rates in measurement and financial contexts.
 |[x]

|  |  |  |
| --- | --- | --- |
|  | **Strand** | **Number** |
|  | **Content description (CD)** | recognise irrational numbers in applied contexts, including $π$ and numbers that develop from the square root of positive real numbers that are not perfect squares, and recognise that irrational numbers cannot develop from the division of integer values by natural numbersVC2M8N01 | establish and apply the exponent laws with positive integer exponents and the zero exponent, using exponent notation with numbers VC2M8N02 | convert between fractions and terminating or recurring decimals, using digital tools as appropriate VC2M8N03 | use the 4 operations with integers and with rational numbers, choosing and using efficient mental and written strategies, and digital tools where appropriate, and making estimates for these computations VC2M8N04 | solve problems involving the use of percentages, including percentage increases and decreases and percentage error, with and without digital tools VC2M8N05 | use mathematical modelling to solve practical problems involving rational numbers and percentages, including financial contexts involving profit and loss; formulate problems, choosing efficient mental and written calculation strategies and using digital tools where appropriate; interpret and communicate solutions in terms of the context, reviewing the appropriateness of the model VC2M8N06 |
| **Teaching and learning unit** | **Semester/Year** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** |
| 8.1.1 Integers and time zones | 1 |[ ]   |[ ]   |[ ]   |[x]  3 |[ ]   |[ ]   |
| 8.1.3 Rational numbers | 1 |[ ]   |[ ]   |[x]  3 |[x]  3 |[ ]   |[x]  4 |
| 8.1.4 Percentages | 1 |[ ]   |[ ]   |[ ]   |[ ]   |[x]  3 |[x]  4 |
| 8.1.5 Real numbers and exponents  | 1 |[x]  1 |[x]  2 |[ ]   |[ ]   |[ ]   |[ ]   |
| 8.2.7 Pythagoras’ theorem and applications | 2 |[x]  1 |[ ]   |[ ]   |[ ]   |[ ]   |[ ]   |
| **Comments, notes, actions** | Phythagoras’ theorem has been aligned to VC2M8N01 as it provides contexts for irrational square roots, and rational decimal approximations to these. |

|  |  |
| --- | --- |
| **Achievement standard (AS) paragraph for Algebra strand, with numbered sentences** | **Y/N** |
| 1. Students apply algebraic properties to simplify, rearrange, expand and factorise linear expressions.
 |[x]
| 1. They graph linear relations and solve linear equations with rational solutions and one-variable inequalities, graphically and algebraically.
 |[x]
| 1. Students plot linear and non-linear relations on the Cartesian plane, with and without the use of digital tools.
 |[x]
| 1. Students use mathematical modelling to solve problems using linear relations, interpreting and reviewing the model in context.
 |[x]
| 1. They make and test conjectures involving linear relations by developing algorithms and using digital tools.
 |[x]

|  |  |  |
| --- | --- | --- |
|  | **Strand** | **Algebra** |
|  | **Content description (CD)** | create, expand, factorise, rearrange and simplify linear expressions, applying the associative, commutative, identity, distributive and inverse properties VC2M8A01 | graph linear relations on the Cartesian plane using digital tools where appropriate; solve linear equations and one-variable inequalities using graphical and algebraic techniques; verify solutions by substitutionVC2M8A02 | use mathematical modelling to solve applied problems involving linear relations, including financial contexts involving profit and loss; formulate problems with linear functions, and choose a representation; interpret and communicate solutions in terms of the context, and review the appropriateness of the model VC2M8A03 | use algorithms and related testing procedures to identify and correct errors VC2M8A04 | experiment with linear functions and relations using digital tools, making and testing conjectures and generalising emerging patterns VC2M8A05 |
| **Teaching and learning unit** | **Semester/Year** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** |
| 8.1.2 The Cartesian plane | 1 |[ ]   |[x]  7 |[ ]   |[ ]   |[ ]   |
| 8.1.3 Rational numbers | 1 |[ ]   |[ ]   |[ ]   |[x]  9 |[ ]   |
| 8.2.1 Algebra and linear expressions  | 2 |[x]  5 |[ ]   |[ ]   |[ ]   |[ ]   |
| 8.2.2 Linear equations and inequalities | 2 |[ ]   |[x]  6, 7 |[ ]   |[ ]   |[x]  9 |
| 8.2.6 Linear functions and graphs | 2 |[ ]   |[x]  6, 7 |[x]  8 |[ ]   |[x]  9 |
| **Comments, notes, actions** | VC2M8A04 – Connect use of algorithms and related testing procedures with divisibility tests. |

|  |  |
| --- | --- |
| **Achievement standard (AS) paragraph for Measurement strand, with numbered sentences** | **Y/N** |
| 1. composite shapes, and volume of right prisms.
 |[x]
| 1. They use Pythagoras’ theorem to solve measurement problems involving unknown lengths of right-angled triangles.
 |[x]
| 1. Students use formulas to solve problems involving the area and circumference of circles.
 |[x]
| 1. They solve problems of duration involving 12- and 24-hour cycles across multiple time zones.
 |[x]

|  |  |  |
| --- | --- | --- |
|  | **Strand** | **Measurement** |
|  | **Content description (CD)** | solve problems involving the area and perimeter of irregular and composite shapes using appropriate units VC2M8M01 | solve problems involving the volume and capacity of right prisms using appropriate unitsVC2M8M02 | solve problems involving the circumference and area of a circle using formulas and appropriate units VC2M8M03 | solve problems involving time and duration, including using 12- and 24-hour time across multiple time zones VC2M8M04 | recognise and use rates to solve problems involving the comparison of 2 related quantities of different units of measure VC2M8M05 | use Pythagoras’ theorem to solve problems involving the side lengths of right-angled triangles VC2M8M06 | use mathematical modelling to solve practical problems involving ratios and rates, including distance-time problems for travel at a constant speed and financial contexts; formulate problems; interpret and communicate solutions in terms of the situation, reviewing the appropriateness of the model VC2M8M07 |
| **Teaching and learning unit** | **Semester/Year** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** |
| 8.1.1 Integers and time zones | 1 |[ ]   |[ ]   |[ ]   |[x]  13 |[ ]   |[ ]   |[ ]   |
| 8.1.6 Shapes, perimeter and area | 1 |[x]  10 |[ ]   |[x]  12 |[ ]   |[ ]   |[ ]   |[ ]   |
| 8.2.3 Ratio and rates | 2 |[ ]   |[ ]   |[ ]   |[ ]   |[x]  4 |[ ]   |[x]  4 |
| 8.2.5 Objects, surface area and volume | 2 |[ ]   |[x]  10 |[ ]   |[ ]   |[ ]   |[ ]   |[ ]   |
| 8.2.7 Pythagoras’ theorem and applications | 2 |[ ]   |[ ]   |[ ]   |[ ]   |[ ]   |[x]  11 |[ ]   |
| **Comments, notes, actions** | Teaching and learning unit 8.1.5 addresses the first part of achievement standard sentence 10 (composite shapes); the second part (volume of right prisms) is addressed in 8.2.5.Note, achievement standard sentence 4 relates to several strands, as it involves modelling practical problems involving ratios, percentages and rates in measurement and financial contexts. |

|  |  |
| --- | --- |
| **Achievement standard (AS) paragraph for Space strand, with numbered sentences** | **Y/N** |
| 1. Students use 3 dimensions to locate and describe position.
 |[x]
| 1. They identify conditions for congruency and similarity in triangles and other common shapes, and design and test algorithms to test for congruency and similarity.
 |[x]
| 1. Students apply the properties of quadrilaterals to solve problems.
 |[x]
| **Achievement standard (AS) paragraph for Statistics strand, with numbered sentences** | **Y/N** |
| 1. Students conduct statistical investigations and explain the implications of obtaining data through sampling.
 |[x]
| 1. Students analyse and describe the distribution of data.
 |[x]
| 1. They compare the variation in distributions of random samples of the same and different size from a given population with respect to shape, measures of central tendency and range.
 |[x]

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Strand** | **Space** | **Statistics** |
|  | **Content description (CD)** | identify the conditions for congruence and similarity of triangles and explain the conditions for other sets of common shapes to be congruent or similar, including those formed by transformations VC2M8SP01 | establish properties of quadrilaterals using congruent triangles and angle properties, and solve related problems explaining reasoning VC2M8SP02 | describe in different ways the position and location of three-dimensional objects in 3 dimensions, including using a three-dimensional Cartesian coordinate system with the use of dynamic geometry software or other digital tools VC2M8SP03 | design and test algorithms involving a sequence of steps and decisions that identify congruency or similarity of shapes, and describe how the algorithm works VC2M8SP04 | distinguish between a population and a sample, and investigate techniques for data collection including census, sampling, experiment and observation, and explain the practicalities and implications of obtaining data through these techniques VC2M8ST01 | analyse and report on the distribution of data from primary and secondary sources using random and non-random sampling techniques VC2M8ST02 | compare variations in distributions and proportions obtained from random samples of the same size drawn from a population and recognise the effect of sample size on this variation VC2M8ST03 | plan and conduct statistical investigations involving samples of a population; use ethical and fair methods to make inferences about the population and report findings, acknowledging uncertainty VC2M8ST04 |
| **Teaching and learning unit** | **Semester/Year** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** |
| 8.1.7 Collecting and displaying data | 1 |[ ]   |[ ]   |[ ]   |[ ]   |[x]  17 |[x]  18 |[x]  19 |[x]  17, 18, 19 |
| 8.2.4 Congruence and similarity  | 2 |[x]  15 |[x]  16 |[ ]   |[x]  15 |[ ]   |[ ]   |[ ]   |[ ]   |
| 8.2.5 Objects, surface area and volume | 2 |[ ]   |[ ]   |[x]  14 |[ ]   |[ ]   |[ ]   |[ ]   |[ ]   |
| **Comments, notes, actions** |  |

|  |  |
| --- | --- |
| **Achievement standard (AS) paragraph for Probability strand, with numbered sentences** | **Y/N.** |
| 1. Students represent the possible combinations of 2 events with tables and diagrams, and determine related probabilities to solve practical problems.
 |[x]
| 1. They conduct experiments or simulations using digital tools to determine related probabilities of compound events.
 |[x]

|  |  |  |
| --- | --- | --- |
|  | **Strand** | **Probability** |
|  | **Content description (CD)** | recognise that complementary events have a combined probability of one; use this relationship to calculate probabilities in applied contexts VC2M8P01 | determine all possible outcome combinations for 2 events, using two-way tables, tree diagrams and Venn diagrams, and use these to determine probabilities of specific events in practical situations VC2M8P02 | conduct repeated chance experiments and simulations, using digital tools to determine probabilities for compound events, and describe results VC2M8P03 |
| **Teaching and learning unit** | **Semester/Year** | **CD** | **AS no.** | **CD** | **AS no.** | **CD** | **AS no.** |
| 8.2.8 Probability and simulations  | 2 |[x]  20 |[x]  20 |[x]  21 |
| **Comments, notes, actions** |  |

# Assessment

|  |  |  |
| --- | --- | --- |
| **Teaching and learning unit** | **Assessment task name(s) and type(s)** | **AS no.** |
| 8.1.1 Integers and time zones | Pre-test (formative, DAL)Activity: Organising a virtual global meeting (formative)End-of-unit test (summative) | 3, 13 |
| 8.1.2 The Cartesian plane | Unit assignment and presentation: Obstacle course (summative) | 7 |
| 8.1.3 Rational numbers | Pre-test (formative, DAL)End-of-unit test (summative) | 3, 4, 9 |
| 8.1.4 Percentages | Task: Tracking changes (summative)End-of-unit test (summative) | 3, 4 |
| 8.1.5 Real numbers and exponents  | Activity: Rice grain (formative)Activity: Estimating the circumference of a circle (formative)End-of-unit test (summative) | 1, 2 |
| 8.1.6 Shapes, perimeter and area | Task: Wacky mansion (summative)End-of-unit test (summative) | 10, 12 |
| 8.1.7 Collecting and displaying data | Unit assignment and presentation: Statistical investigation (summative) | 17, 18, 19 |
| 8.2.1 Algebra and linear expressions  | Pre-test (formative, DAL)End-of-unit test (summative) | 5 |
| 8.2.2 Linear equations and inequalities | Activity: What side are you on? (formative)End-of-unit test (summative) | 6, 7, 9 |
| 8.2.3 Ratio and rates | Pre-test (formative, DAL)Task: How fast can it move? (summative)End-of-unit test (summative) | 4 |
| 8.2.4 Congruence and similarity  | Activity: Do they match? (formative)End-of-unit test (summative) | 15, 16 |
| 8.2.5 Objects, surface area and volume | Unit assignment and presentation: Moon station (summative) | 10, 14 |
| 8.2.6 Linear functions and graphs | Activity: Exploring patterns (formative)Activity: Modelling a practical problem (summative, VCAA ‘Level 8 example assessment task – Linear relations’) End-of-unit test (summative) | 6, 7, 8, 9 |
| 8.2.7 Pythagoras’ theorem and applications | Activity: Triangle review (formative)Activity: Finding lengths (formative)End-of-unit task (summative, VCAA Level 8 example assessment task – Pythagoras’ theorem)  | 1, 11 |
| 8.2.8 Probability and simulations  | Unit assignment and presentation (summative) | 20, 21 |

# Analysis of curriculum coverage

|  |
| --- |
| The curriculum area map is based on 2 18-week semesters and addresses all Level 8 content descriptions (CDs) and all aspects of the Level 8 achievement standard (AS).Several AS sentences have been mapped to more than one unit. In particular, the following 4 AS sentences are addressed across 3 units:* AS sentence 3. Students solve problems involving the 4 operations with integers and positive rational numbers.
* AS sentence 4. They use mathematical modelling to solve practical problems involving ratios, percentages and rates in measurement and financial contexts.
* AS sentence 7. Students plot linear and non-linear relations on the Cartesian plane, with and without the use of digital tools.
* AS sentence 9. They make and test conjectures involving linear relations by developing algorithms and using digital tools.

Some notable changes between this sequence of units and the previous sequence of units (based on Victorian Curriculum Version 1.0) are as follows:* Time zones has been shifted to 8.1.1 to connect with the work on integers.
* Real numbers are now addressed in Semester 1, ahead of the introduction of $π$.
* Ratio and rates are being taught earlier to support 8.2.4. Note the inclusion of similarity at Level 8, including those formed by transformations.
* Introduction of three-dimensional Cartesian coordinate system, with the use of dynamic geometry software or other digital tools, has been incorporated into 8.2.5.
* Inclusion of one-variable inequalities using graphical and algebraic techniques has been incorporated into 8.2.2 and 8.2.6.
* Pythagoras’ theorem is introduced at Level 8.

The listed assessments provide a common set of formative and summative assessments to be completed by all Level 8 classes. Additional formative activities can be undertaken as required. |

# Next steps

|  |
| --- |
| Familiarise yourself with the specific Level 8 curriculum updates – see VCAA **Mathematics – comparison of curriculums document (Version 1.0 to Version 2.0)** – including the increased emphasis on the 4 mathematical processes of:* probability experiments and simulations
* statistical investigation
* mathematical modelling
* computational thinking.

In year level teams:* determine the time allocated for each of the units listed in the curriculum area map
* review existing individual Victorian Curriculum F–10 Version 1.0 teaching and learning unit plans, and update or redevelop as applicable.
 |