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**AusVELS Mathematics Level 5**

**Understanding** includes making connections between representations of numbers, using fractions to represent probabilities, comparing and ordering fractions and decimals and representing them in various ways

**Fluency** includes choosing appropriate units of measurement for calculation of perimeter and area, using estimation to check the reasonableness of answers to calculations and using instruments to measure angles

 **Problem Solving** includes formulating and solving authentic problems using numbers and measurements, creating transformations and identifying line and rotational symmetries

 **Reasoning** includes investigating strategies to perform calculations efficiently, creating financial plans, interpreting results of chance experiments and interpreting data sets

\*This document intends to assist teachers in their implementation of the Australian curriculum through AUSVELS– it combines description and elaboration statements. The blue elaborations are examples of how the learning can be achieved; not a list of tasks that have to be done. Teachers are advised to consult the online documentation to clarify further detail for themselves. The ‘AusVELS’ is the official documentation for Victorian schools.

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| **Number & Algebra:** | **Measurement & Geometry:** | **Statistics & Probability:** |
| **Number & place value:**Identify and describe factors and multiples of whole numbers and use them to solve problems (ACMNA098)* exploring factors and multiples using number sequences
* using simple divisibility tests

Use estimation and rounding to check the reasonableness of answers to calculations(ACMNA099)* recognising the usefulness of estimation to check calculations
* applying mental strategies to estimate the result of calculations, such as estimating the cost of a supermarket trolley load

Solve problems involving multiplication of large numbers by one or two digit numbers using efficient mental, written strategies and appropriate digital technologies (ACMNA100)* exploring techniques for multiplication such as the area model, the Italian lattice method or the partitioning of numbers
* applying the distributive law and using arrays to model multiplication and explain calculation strategies

Solve problems involving division by a one digit number, including those that result in a remainder (ACMNA101)* using the fact that equivalent division calculations result if both numbers are divided by the same factor
* interpreting and representing the remainder in division calculations sensibly for the context

Use efficient mental and written strategies and apply appropriate digital technologies to solve problems (ACMNA291)* using calculators to check the reasonableness of answers

**Fractions & Decimals:**Compare and order common unit fractions and locate and represent them on a number line (ACMNA102)* recognising the connection between the value of a unit fraction and its denominator

Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator (ACMNA103)* modelling and solving addition and subtraction problems involving fractions by using jumps on a number line, or making diagrams of fractions as parts of shapes

Recognise that the place value system can be extended beyond hundredths (ACMNA104)* using knowledge of place value and division by 10 to extend the number system to thousandths and beyond
* recognising the equivalence of thousandths and 0.001

Compare, order and represent decimals (ACMNA105)* recognising that the number of digits after the decimal place is not equivalent to the value of the fraction
* locating decimals on a number line

**Money & Financial mathematics:**Create simple financial plans (ACMNA106)* creating a simple budget for a class fundraising event
* identifying the GST component of invoices and receipts

**Patterns & algebra:**Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction (ACMNA107)* using the number line or diagrams to create patterns involving fractions or decimals

Use equivalent number sentences involving multiplication and division to find unknown quantities (ACMNA121)* using relevant problems to develop number sentences
 | **Using units of measurement:**Choose appropriate units of measurement for length, area, volume, capacity and mass (ACMMG108)http://www.australiancurriculum.edu.au/Static/img/icons/tags/leg-c2.gif* investigating alternative measures of scale to demonstrate that these vary between countries and change over time, for example temperature measurement in Australia, Indonesia, Japan and USA
* recognising that some units of measurement are better suited for some tasks than others, for example kilometres rather than metres to measure the distance between two towns

 Calculate the perimeter and area of rectangles using familiar metric units (ACMMG109)* exploring efficient ways of calculating the perimeters of rectangles such as adding the length and width together and doubling the result
* exploring efficient ways of finding the areas of rectangles, such as recognising that counting the number of square centimetres in a grid gives the same result as multiplying the length and width

Compare 12 and 24 hour time systems and convert between them (ACMMG110)http://www.australiancurriculum.edu.au/Static/img/icons/tags/leg-c1.gif* investigating the ways time was and is measured in different Aboriginal Country, such as using tidal change
* using units hours, minutes and seconds

**Shape:**Connect three-dimensional objects with their nets and other two-dimensional representations (ACMMG111)* identifying the shape and relative position of each face of a solid to determine the net of the solid, including that of prisms and pyramids
* representing two-dimensional shapes such as photographs, sketches and images created by digital technologies

**Location & transformation:**Use a grid reference system to describe locations. Describe routes using landmarks and directional language (ACMMG113)http://www.australiancurriculum.edu.au/Static/img/icons/tags/leg-c1.gif* comparing aerial views of Country, desert paintings and maps with grid references
* creating a grid reference system for the classroom and using it to locate objects and describe routes from one object to another

Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries (ACMMG114)* identifying and describing the line and rotational symmetry of a range of two-dimensional shapes, by manually cutting, folding and turning shapes and by using digital technologies
* identifying the effects of transformations by manually flipping, sliding and turning two-dimensional shapes and by using digital technologies

Apply the enlargement transformation to familiar two-dimensional shapes and explore the properties of the resulting image compared with the original(ACMMG115)* using digital technologies to enlarge shapes
* using a grid system to enlarge a favourite image or cartoon

**Geometric reasoning:**Estimate, measure and compare angles using degrees. Construct angles using a protractor (ACMMG112)* measuring and constructing angles using both 180° and 360°protractors
 | **Chance:**List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions (ACMSP116)http://www.australiancurriculum.edu.au/Static/img/icons/tags/leg-c2.gif* commenting on the likelihood of winning simple games of chance by considering the number of possible outcomes and the consequent chance of winning in simple games of chance such as jan-ken-pon (rock-paper-scissors)

Recognise that probabilities range from 0 to 1 (ACMSP117)* investigating the probabilities of all outcomes for a simple chance experiment and verifying that their sum equals 1

**Data representation & interpretation:**Pose questions and collect categorical or numerical data by observation or survey (ACMSP118)http://www.australiancurriculum.edu.au/Static/img/icons/tags/leg-c3.gif* posing questions about insect diversity in the playground, collecting data by taping a one-metre-square piece of paper to the playground and observing the type and number of insects on it over time

Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies (ACMSP119)* identifying the best methods of presenting data to illustrate the results of investigations and justifying the choice of representations

Describe and interpret different data sets in context (ACMSP120)* using and comparing data representations for different data sets to help decision making, such as choosing the best mobile phone plan
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| **Level 5 Achievement Standard****Number and Algebra**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.**Measurement and Geometry**Students use appropriate units of measurement for length, area, volume, capacity and mass, and calculate perimeter and area of rectangles. They convert between 12 and 24 hour time. Students use a grid reference system to locate landmarks. They estimate angles, and use protractors and digital technology to construct and measure angles. Students connect three dimensionalobjects with their two dimensional representations. They describe transformations of two dimensional shapes and identify line and rotational symmetry.**Statistics and Probability**Students pose questions to gather data and construct various displays appropriate for the data, with and without the use of digital technology. They compare and interpret different data sets. Students list outcomes of chance experiments with equally likely outcomes and assign probabilities as a number from 0 to 1.Mathematics |

Cross-curriculum priorities to be included in all learning areas:

Aboriginal and Torres Strait Islander histories and cultures ();

Asia and Australia’s engagement with Australia ( );

Sustainability ()

Reference : <http://ausvels.vcaa.vic.edu.au/> This grid is an adaption of the information from the VCAA site to create a visual representation to assist teachers.