Australian Mathematics Curriculum – AusVELS – Level 5

These levels [levels 3 – 6] emphasise the importance of students studying coherent, meaningful and purposeful mathematics that is relevant to their lives. Students still require active experiences that allow them to construct key mathematical ideas, but also gradually move to using models, pictures and symbols to represent these ideas.

The curriculum develops key understandings by extending the number, measurement, geometric and statistical learning from the early levels; by building foundations for future studies through an emphasis on patterns that lead to generalisations; by describing relationships from data collected and represented; by making predictions; and by introducing topics that represent a key challenge in these levels, such as fractions and decimals.

In these levels of schooling, it is particularly important for students to develop a deep understanding of whole numbers to build reasoning in fractions and decimals and to develop a conceptual understanding of place value. These concepts allow students to develop proportional reasoning and flexibility with number through mental computation skills, and to extend their number sense and statistical fluency.

Suggested Yearly Overview – Term by Term Planner

- The following overview has been developed using the Australian Mathematics Curriculum content and proficiency standards as a basis for the outline. Teachers will therefore need to develop appropriate quality learning experiences, and use the outcomes from these activities to determine progress in relation to the standards. Teachers need to make continual reference to the descriptors and elaborations listed in the AMC as this overview only shows a suggested outline.

- While the term by term topics have been divided up throughout the year for planning purposes, the content will often be interwoven with topics featured in different terms. The selection of topics in different content strands will often complement each other [for e.g. length could connect to addition, subtraction, decimals and graphing. Fractions could relate to clocks, shape, division and graphing.] Schools may need to alter the overviews based on their needs. Local events, integrated curriculum topics, school camp and other circumstances will need to be considered.

- While the structure is adjustable to suit the needs of the school, the basic outline works on the premise that at least five hours per week is timetabled for mathematics. To help cover the content listed teachers should endeavor to address several outcomes in the one lesson by integrating across the strands but still have a clear focus for the lessons planned. Opportunities for teachers to link mathematics to other learning areas such as English, Science or History will help students make connections across learning domains.

- There are three cross curriculum priorities in the Australian Curriculum: Aboriginal and Torres Strait Islander histories and cultures: Asia and Australia’s engagement with Asia: Sustainability. These priorities should be connected to tasks where there are natural and clear connections to the content being taught. The AMC lists possible descriptors that naturally connect to these cross curriculum priorities.
Proficiency Strands - ‘How’ content is explored or developed.

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, describing transformations and identifying line and rotational symmetry.

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 whole numbers and measurements and creating financial plans.

Reasoning includes investigating strategies to perform calculations efficiently, continuing patterns involving fractions and decimals, interpreting results of chance experiments, posing appropriate questions for data investigations and interpreting data sets.

The proficiency strands need to be embedded in all content strands.

Content Strands - ‘What’ is to be learnt.

<table>
<thead>
<tr>
<th>Term</th>
<th>Number and Algebra</th>
<th>Measurement and Geometry</th>
<th>Statistics and Probability</th>
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<tbody>
<tr>
<td>1</td>
<td>Extend understanding of place value of whole numbers. Ensure that students can see and understand the Second Place-Value Pattern which involves the repeated use of hundreds, tens and ones to count certain units (e.g., thousands, millions, billions, trillions ...) from 1 to 999 instead of 1 to 9. Discuss the idea of infinity in relation to our number system.</td>
<td>Use materials, pictures, digital photos, and symbols (e.g. arrays in the environment, number lines and charts) to assist in identifying and describing factors and multiples of whole numbers.</td>
<td>This term work in the Measurement and Geometry area will be integrated into our work in the Number and Algebra areas. Specific Measurement and Geometry areas will be covered in following terms.</td>
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<td>Using real life examples where possible make, name and record Decimal Fractions and consolidate by:</td>
<td>Mentally compute using place value knowledge and number properties. Recognise the usefulness of estimation and rounding when calculating and being able to check the answer for reasonableness in relation to the problem at hand.</td>
<td>Statistics</td>
</tr>
<tr>
<td></td>
<td>• Using real life examples where possible make, name and record Decimal Fractions and consolidate by:</td>
<td>• Use materials, pictures, digital photos, and symbols (e.g. arrays in the environment, number lines and charts) to assist in identifying and describing factors and multiples of whole numbers.</td>
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<td>• Expanding decimals – E.g. 7.42 = 7 Ones + 4 Tenths + 2 Hundredths</td>
<td>• Describe, continue and create patterns with fractions, decimals and whole numbers. Use a variety of number lines and charts, fraction wall and fraction pattern blocks.</td>
<td>• Pose questions and collect categorical or numerical data by observation or survey. For example 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.</td>
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<td>• Renaming decimals – E.g. 7.42 metres is the same as 7metres and 42 Hundredths of a metre.</td>
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<td>• Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies. For example use a line graph to show data that changes such as the temperature throughout the day. A pie graph to show percentages.</td>
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<td>• Read, write and record numbers in stories, symbols, materials and words.</td>
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• Identify and describe factors and multiples of whole numbers and use them to solve problems. Use simple divisibility tests. For example – test to see if 380 is divisible by 2, 3, 4 or 5. Conclusion all even numbers are divisible by 2.

• Revisit and reinforce work already done in level 4 in multiplication and division facts to 10 x 10. [Refer to level 4 overview]

• Extend understanding of operations with whole numbers and solve simple problems involving the four operations using a range of strategies including digital technology. Focus on multiplication and division this term. Solve problems involving multiplication by one digit numbers first and by two digit numbers then using larger numbers for able students.

  Use efficient mental, written strategies and appropriate digital technologies Materials/Models and explore techniques for multiplication such as the area model, the Italian lattice method or the partitioning of numbers. Use measurement topics of volume and area to help students apply x’n to real situations.

  Apply the distributive and commutative properties 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. Interpret and represent the remainder in division calculations sensibly for the context. For example if dividing $17 amongst 4 children they would each get $4.25. If dividing 17 apples they would each get 4¼ apples. If dividing 17 tennis balls they would each get 4 tennis balls and do rock paper scissors to see who gets the left over ball.

• Use equivalent number sentences involving multiplication and division to find unknown quantities.

  For example [4 x 6 = ? x 3 ] or [ ? ÷ 4 = 3 x 3] Use pan scales and connecting unifix blocks to create and record equivalent statements. Consolidate understanding of inverse operations multiplication /division).

• Continue to mentally compute using place value knowledge and number properties. Recognise the usefulness of estimation and rounding when calculating and being able to check the answer for reasonableness in relation to the problem at hand using calculators.