Mathematics Progression Points: Year 4 – v8.0

Independent Schools Queensland (ISQ) has developed this version of the Progression Points to support teachers in independent schools with implementation of version 8 of the Australian Curriculum. This work has been done with support from officers at ACARA.

Teachers of Prep to Year 2 will find significant changes in English from previous versions of the Australian Curriculum – particularly with the inclusion of more specific references to phonics and phonemic awareness. Changes to the curriculum have also been made in all other year levels in both English and mathematics.

A word document version of the Progression Points is available so that teachers can rearrange the sequences of learning.

Personnel in independent schools are encouraged to consider how the Progression Points could be used to:-

* diagnose through formative assessment, the capabilities, strengths and weaknesses of individual students
* plan teaching programs to meet the needs of individuals and groups of students
* formally assess the progress of individuals and groups of students
* report to parents on the achievements of their children against the Australian Curriculum.

As with previous versions of the Progression Points, the “demonstrating” column accurately reflects the expectations of version 8 of the Australian Curriculum achievement standards – however with more detail and examples included.

ISQ welcomes any suggestions for improvement from teachers working very closely with the Progression Points.

More information

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| **Year 4 Achievement Standard**  By the end of Year 4, students choose appropriate strategies for calculations involving multiplication and division. (MKU4.1) They [recognise](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Recognise) common equivalent fractions in familiar contexts and make connections between fraction and decimal notations up to two decimal places. (MKU4.2) Students [solve](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Solve) simple purchasing problems. (MKU4.3) They [identify](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Identify) and [explain](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Explain) strategies for finding unknown quantities in number sentences. (MKU4.4) They [describe](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Describe) number patterns resulting from multiplication. (MKU4.5) Students [compare](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Compare) areas of regular and irregular shapes using informal units. (MKU4.6) They [solve](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Solve) problems involving time duration. (MKU4.7) They [interpret](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Interpret) information contained in maps. (MKU4.8) Students [identify](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Identify) dependent and independent events. (MKU4.9) They [describe](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Describe) different methods for data collection and representation, and [evaluate](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Evaluate) their effectiveness. (MKU4.10)  Students use the properties of odd and even numbers. (MS4.1) They [recall](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Recall) multiplication facts to 10 x 10 and related division facts. (MS4.2) Students [locate](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Locate) familiar fractions on a number line. (MS4.3) They continue number sequences involving multiples of single digit numbers. (MS4.4) Students use scaled instruments to [measure](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Measure) temperatures, lengths, shapes and objects. (MS4.5) They convert between units of time. Students create symmetrical shapes and patterns. (MS4.6) They [classify](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Classify) angles in relation to a right angle. (MS4.7) Students [list](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=List) the probabilities of everyday events. (MS4.8) They [construct](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Construct) data displays from given or collected data. (MS4.9) | | | | | |
| **Strand** | **Emerging** | **Developing** | **Demonstrating** | **Advancing** | **Extending** |
| Beginning to work towards the achievement standard | Working towards the achievement standard | Demonstrating the achievement standard | Working beyond the achievement standard | Extending with depth beyond the achievement standard |
| * *With explicit prompts (step-by-step oral scaffolding, concrete materials, reference to charts, etc)* * *In familiar contexts* * *Learning to follow procedures* | * *With prompts (oral or written questions, concrete materials, reference to charts, etc)* * *In familiar contexts* * *Attempts to explain* | * *Independent (with access to concrete materials, charts, etc)* * *In familiar contexts* * *Explains basic understanding* | * *Independent (with access to concrete materials, charts, etc)* * *Applying in familiar contexts* * *Explains with detail* | * *Independent (with access to concrete materials, charts, etc)* * *Applying in new contexts* * *Explains with connections outside the teaching context* |
| Proficiency strands  *At this level:* | * Understanding *includes making connections between representations of numbers, partitioning and combining numbers flexibly, extending place value to decimals, using appropriate language to communicate times, and describing properties of symmetrical shapes.* * Fluency *includes recalling multiplication tables, communicating sequences of simple fractions, using instruments to measure accurately, creating patterns with shapes and their transformations, and collecting and recording data.* * Problem Solving *includes formulating, modelling and recording authentic situations involving operations, comparing large numbers with each other, comparing time durations, and using properties of numbers to continue patterns.* * Reasoning *includes using generalising from number properties and results of calculations, deriving strategies for unfamiliar multiplication and division tasks, comparing angles, communicating information using graphical displays and evaluating the appropriateness of different displays.* | | | | |
| **Relevant part of the Achievement Standard** | **Students use the properties of odd and even numbers. (MS4.1)** | | | | |
| **Number and Algebra:**  Number and place value  [*ACMN071*](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA071) | **Students are beginning to:**   * **Identify** whether whole numbers up to 1000 are odd or even * **Explain** the characteristics of odd numbers and even numbers * **Make observations** about addition and subtraction facts that involve:   + pairs of odd numbers that always result in an even number answer   + pairs of even numbers that always result in an even number answer   + one even number and one odd number that always result in an odd number answer | **Students are developing the ability to:**   * **identify** whether 4- and 5- digit whole numbers are odd or even and explain how they made their decisions * **Make observations** about multiplication facts that involve:   + pairs of odd numbers - that always result in an odd number answer   + pairs of even numbers - that always result in an even number answer   + one even number and one odd number - that always result in an even number answer | * Students **independently:** * **Investigate** and **use** the properties of odd and even numbers (e.g. use arrays to display various odd numbers such as 3 by 7 and say that both factors must be odd for the number to be odd) * **Use** the four operations with pairs of odd numbers, pairs of even numbers or one of each type and **use** established relationships to check the accuracy of calculations (e.g. say confidently that 13 × 15 will be an odd number answer ending in ‘5’) * **Use calculators** to check estimates and predictions made about the results of multiplying small odd and even numbers. | Students:   * **Demonstrate** an awareness and make predictions about the results of calculations involving odd and even numbers (e.g. predict that any odd number divided by 2, 4 or 8 will not give a whole number result) * **Investigate** the multiplication of odd and numbers and make statements based on their observations (e.g. if an odd number such as 25 is multiplied by another odd number, the result will end in 5, but if it multiplied by an even number, the result will end in a 0) | Students:   * **Investigate** the multiplication and division of whole numbers by single digit odd numbers and make statements based on their observations (e.g. if a number divides evenly by 9 then it will also divide evenly by 3) |
| **Strands and content descriptions for teaching** | **Emerging** | **Developing** | **Demonstrating** | **Advancing** | **Extending** |
| Beginning to work towards the achievement standard | Working towards the achievement standard | Demonstrating the achievement standard | Working beyond the achievement standard | Extending with depth beyond the achievement standard |
| **Relevant part of the Achievement Standard** | **They continue number sequences involving multiples of single digit numbers. (MS4.4)** | | | | |
| Number and place value  [*ACMNA072*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA072)  [*ACMNA073*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA073) | **Students are beginning to:**   * **Recognise and represent** whole numbers up to 4-digits including reading numbers that are presented in various forms (e.g. when shown a concrete representation using MAB, say the number and write it down in words and numerals) * **Extend** the counting system to include larger numbers (e.g. count on from any given 3- or 4- digit number (e.g. given 358 as a starting point, count on saying 359, 360, 361, ...) | **Students are developing the ability to:**   * **Recognise and represent** whole numbers up to 5-digits and link different representations of the same number * **Identify and describe** the place values of individual digits in numbers up to 5-digits using a place value chart | They **independently:**   * **Recognise, represent** and **order** numbers to at least tens of thousands (e.g. interpret a 5-digit whole number represented on an abacus, read it aloud and write the number in words and using numerals) * **Apply** place value when partitioning whole numbers (e.g. write numbers to show the place value of individual digits such as 15 693 = 10 000 + 5 000 + 600 + 90 + 3) * **Rearrange and regroup** numbers to at least tens of thousands to assist calculations and solve problems * **Recognise and demonstrate** that the base ten place-value system is a multiplicative one built on the multiplication or division of tens (e.g. use a place value chart to show that as digits move column by column to the left they become ten times larger with each move – and vice versa as they move to columns on the right) | Students:   * **Describe** their knowledge of the place value system for numbers to 5-digits in their own words and use this knowledge to interpret, read and record larger numbers (up to millions) * **Identify and describe** the value of individual digits in larger whole numbers by recording them on place value charts | Students:   * **Research and describe** the structure of the place value system in relation to the recording and reading of very large whole numbers (e.g. describe the H T Ones structure and the names of the number periods – Ones, Thousands, Millions, Billions etc – and use this to read and record some very large numbers) |
| Number and place value  [*ACMNA074*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA074) | **Students are beginning to:**   * **Generate** skip counting patterns based around the multiples of 2, 3 and 4 * **Recognise** some counting patterns and can continue them as required | **Students are developing the ability to:**   * **Investigate** number patterns that relate to the multiplication facts (e.g. count in multiples of 6 and relate these to the 6s multiplication facts) * **Recognise** well known patterns such as the multiples of 2, 4 and 5 and continue them as required | Students **independently:**   * I**nvestigate** number sequences involving multiples of 3,4,6,7,8, and 9 * **Recognise** that number sequences can extended indefinitely * **Recognise** and **determine** any patterns in the sequences | Students:   * **Investigate and describe** the ones digits within a range of skip counting patterns and make statements about their consistency (e.g. skip counting patterns involving the odd numbers involve all of the counting numbers from 0 to 9 and then repeat – with a 7s pattern the ones digits are 7, 4, 1, 8, 5, 2, 9, 6, 3 and 0, then start again) | Students:   * **Demonstrate** why the pattern with the ones digits occurs and repeats when skip counting patterns involve odd numbers (such as the 7s pattern...7, 14, 21, 28, 35, etc), but not when skip counting patterns involve even numbers |
| **Strands and content descriptions for teaching** | **Emerging** | **Developing** | **Demonstrating** | **Advancing** | **Extending** |
| Beginning to work towards the achievement standard | Working towards the achievement standard | Demonstrating the achievement standard | Working beyond the achievement standard | Extending with depth beyond the achievement standard |
| **Relevant part of the Achievement Standard** | **They** [**recall**](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Recall) **multiplication facts to 10 x 10 and related division facts. (MS4.2)**  **Students choose appropriate strategies for calculations involving multiplication and division. (MKU4.1)** | | | | |
| Number and place value  [*ACMNA075*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA075)  Number and place value  [*ACMNA076*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA076) | **Students are beginning to:**   * **Recall** some multiplication facts such as the 2s and 5s (e.g. use calculators and concrete materials to identify the skip counting patterns associated with 2s and 5s) * **Use efficient strategies** to work out related facts such as the 4s, 8s and 10s * **Use concrete materials** to solve division situations by sharing | **Students are developing the ability to:**   * **Recall** most of the multiplication facts and use efficient strategies to work out the remaining facts (e.g. given 9 × 2 to work out, use concrete materials and the commutative property to change it to 2 × 9 and think about it as *double 9 makes 18*)   **Use the strategy** *think of the related multiplication fact* when working out most division facts | They **independently**:   * **Recall** multiplication facts up to 10 x 10 * **Use** known multiplication facts to calculate related division facts * **Develop** efficient mental and written strategies for multiplication and division where there is no remainder (e.g. use doubling and halving techniques to work out the answer to multiplication and division situations involving 2s, 4s and 8s)   **Use** appropriate digital technologies for multiplication and for division where there is no remainder | Students:   * **Recall** the multiplication facts and describe how those facts can be extended (e.g. say that if we know that 7 × 6 = 42, then 7 × 60 = 420 and 70 × 6 = 420) * **Identify and explain** relationships between basic multiplication facts (e.g. use arrays to show that if 7 × 3 = 21 then  7 × 6 will be double...42) * **Recall** some of the division facts or use the related multiplication fact to work them out | Students:   * **Recall** the division facts or use efficient strategies to work them out (e.g. I know that 6 × 3 = 18 so 18 ÷ 6 must equal 3) * **Identify and explain** relationships between basic division facts (e.g. use concrete materials to show if 20 ÷ 2 = 10 then 20 ÷ 4 will be half that...5) * **Use concrete materials** and an efficient written method to work out the answer to division situations involving a single digit divisor |
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| **Relevant part of the Achievement Standard** | **They** [**recognise**](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Recognise) **common equivalent fractions in familiar contexts and make connections between fraction and decimal notations up to two decimal places. (MKU4.2)**  **Students** [**locate**](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Locate) **familiar fractions on a number line. (MS4.3)** | | | | |
| Fractions and Decimals  [*ACMNA077*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA077)  [*ACMNA078*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA078) | **Students are beginning to:**   * **Represent and interpret** models of most proper fractions to tenths * **Write** proper fractions in words (3 eighths) and in numeral form () * **Recognise and read** mixed numbers such as 5 and make reasonable models of them | **Students are developing the ability to:**   * **Identify and describe** examples of equivalent fractions based on the use of models (e.g. say that and have the same value because the amount of shading of two identical rectangles is the same) * **Use number lines** when counting with fractions and to illustrate the equivalence of pairs of proper fractions such as and | They **independently**:   * **Investigate** equivalent fractions used in contexts * **Explore** the relationship between families of fractions including halves, quarters, eighths, thirds, sixths (e.g. fold a series of paper strips to make a paper wall) * **Count** by quarters halves and thirds, including with mixed numerals (e.g. use a number line to support counting by quarters and to represent each of the numbers) * **Locate** and **represent** these fractions on a number line and to illustrate that 2 also equals * **Convert** mixed numbers to improper fractions (e.g. use the representations on the number line to highlight mixed numbers and improper fractions that are equivalent)   **Convert** improper fractions to mixed numbers | Students:   * **Create and use** a fraction wall to identify and display all of the equivalent fractions within the range of fractions in the wall   **Explain** why fractions with different denominators can be termed as equivalent (e.g. use a number line to demonstrate that fractions such as and occur as the same point on the line and therefore have the same value) | Students:   * **Identify and describe** techniques for generating other equivalent fractions (e.g. say that the numerator and denominator of any fraction can be multiplied (or divided) by the same number to create equivalent fractions) |
| Fractions and Decimals  [*ACMNA079*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA079) | **Students are beginning to:**   * **Observe** the use of the decimal point in money and measures to separate wholes from fractional parts of a whole | **Students are developing the ability to:**   * **Observe** the link between key decimal fractions (0.5) and proper fractions () * **Use place value charts** to record some decimal fractions to tenths and link these to wholes (or Ones) | Students **independently:**   * **Recognise** that the place value system can be extended to tenths and hundredths. * **Make connections** between fractions and decimal notation * **Use** division by 10 to extend the place-value system * **Use** knowledge of fractions to establish equivalences between fractions and decimal notation | Students:   * **Interpret and read** decimal fractions in a variety of ways (e.g. say that 2.25 can be read as:   + two point two five;   + two and twenty-five hundredths;   + two ones, two tenths and five hundredths   + two and one-quarter * **make links** between some decimal fractions and their proper fraction equivalents (e.g. say that 0.2 = or and that 0.25 = or ) | Students:   * **Identify and use** the most efficient form of fraction depending on the context (e.g. say that when told that 0.2 of the days in November were rainy, say that it would be easier to say that of the days were rainy) |
| **Strands and content descriptions for teaching** | **Emerging** | **Developing** | **Demonstrating** | **Advancing** | **Extending** |
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| **Relevant part of the Achievement Standard** | **Students solve simple purchasing problems. (MKU4.3)** | | | | |
| Money and financial mathematics  [*ACMNA080*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA080) | **Students are beginning to:**   * **Make links** between price tags on items and the amount needed to buy them * **Work out mentally** the change required when a $1 coin is tendered for items that cost less than one dollar * **Calculate** the change when a $5 or $10 is used to pay when shopping (e.g. how much change is due when $10 is tendered for an item worth $3.65) | **Students are developing the ability to:**   * **Recognise** the currencies used by other countries * **Use technology** such as a calculator to solve problems involving money (e.g. check the total costs of purchases using a calculator) | Students **independently:**   * **Solve** problems involving purchases (e.g. check whether $100 is sufficient to pay for four selected items) * **Calculate** change using mental or written methods or by using available technology * Interpret money amounts and round where necessary to the nearest five cents (e.g. see that the total of four purchases is $12.48 and round this amount to $12.50) | Students:   * **Identify and describe** efficient techniques for mentally calculating change when a large Australian bank note is tendered (e.g. describe how the change can be worked out when $50 is given to pay for a $27.90 item) | Students:   * **Identify and describe** the symbols used to show how different currencies are indicated (e.g. say that AUD is used for Australian dollars, the ¥ is used for Japanese yen and the £ is used for the English pound) |

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| **Relevant part of the Achievement Standard** | **They describe number patterns resulting from multiplication. (MKU4.5)** | | | | |
| Patterns and algebra  [*ACMNA081*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA081) | **Students are beginning to:**   * **Describe** the way that skip counting patterns also link with multiplication (e.g. say that a skip counting pattern such as 3, 6, 9, 12, 15, ... shows the multiples of three) | **Students are developing the ability to:**   * **Describe** the rules associated with skip counting patterns as either addition or multiplication | They **independently:**   * **Explore** and **describe** number patterns resulting from performing multiplication * **Identify** examples of number patterns in everyday life (e.g. observe the pattern of numbers showing the dates on calendars and describe how they relate to addition or multiplication) | Students:  **Create and explain** number patterns based around skip counting and the multiples of numbers and demonstrates the links to multiplication facts (e.g. analyses a pattern such as 6, 12, 18, 24, 30, ... and says that these are the answers to the × 6 facts....6 × 1, 6 × 2, 6 × 3 etc) | Students:   * **Create and explain** more complex patterns including those with two steps such as double and add 3   **Analyse** given patterns and work out the rules so that the pattern can be continued (e.g. study the pattern....4, 7, 10, 13, 16, ...., decide that the rule is × 3 add 1, and say that the next numbers will be 19) |
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| **Relevant part of the Achievement Standard** | **They identify and explain strategies for finding unknown quantities in number sentences. (MKU4.4)** | | | | |
| Pattern and algebra  [*ACMNA082*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA082)  [*ACMNA083*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMNA083) | **Students are beginning to:**   * **Identify** addition and subtraction problems and write number sentences that represent them * **Solve** straightforward addition and subtraction number sentences | **Students are developing the ability to:**   * **Identify** word problems that involve multiplication * **Write** simple word problems that match given number sentences involving multiplication (e.g. if there are 6 weeks before school finishes, how many days will that be?) | They **independently**:   * **Solve** word problems by using number sentences involving multiplication or division where there is no remainder * **Represent** a word problem as a number sentence * **Write** a word problem using a given number sentence * **Use** equivalent number sentences involving addition and subtraction to find unknown quantities * **Write** number sentences to represent and answer questions (e.g. when a number is added to 23 the answer is the same as 57 minus 19. What is the number?) * **Use** partitioning to find unknown quantities in number sentences | Students:   * **Create** own number sentences involving any single operation and compose matching word problems (e.g. write down 24 × 5 = 🗌 and then write *how many hours are there in 5 days?*) | Students:   * **Experiment** with writing number sentences involving two operations and compose matching word problems (e.g. write down 5 + 4 × 7 = 🗌 and then write *today is Monday and on next Saturday, it will be four weeks till my birthday – how many days after today will that be?*) |
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| **Relevant part of the Achievement Standard** | **Students use scaled instruments to measure temperatures, lengths, shapes and objects. (MS4.5)** | | | | |
| **Measurement and Geometry**  Using units of measure  [*ACMMG084*](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMMG084) | **Students are beginning to:**   * **Identify and describe** the units used on a range of measuring instruments (e.g. say that a measuring tape uses centimetres or that a set of kitchen scales uses grams | **Students are developing the ability to:**   * **Demonstrate** ways of using a range of common measuring instruments such as rulers, measuring tapes, kitchen scales, thermometers and graduated jugs, to the nearest whole unit with reasonable efficiency | Students **independently**:   * **Use** scaled instruments to **measure** and **compare** lengths, masses, capacities and temperatures using the following units metres, centimetres, kilograms, grams, litres and millilitres * **Read** and **interpret** the graduated scales on a range of measuring instruments to the nearest graduation (e.g. say that each of the spaces between the smaller graduations on a metre ruler represents one centimetre; or identify the one litre and half-litre marks on a measuring jug and use them to measure amounts of water) | Students:   * **Analyse** the graduations on a range of measuring instruments for length and suggest what the smaller graduations measure (e.g. identify millimetres as the small graduations on some rulers and use them to measure lengths more accurately) | Students:   * **Interpret** the graduations used on various containers that measure the volume of water and work out what the minor graduations mean (e.g. work out that because there are four minor marks between 0 and 1 litre, there are five spaces, so each space must represent 200 millilitres)   **Interpret** the scales used on a range of kitchen scales and work out what mass would be measured at each mark (e.g. know that 1000 g are needed to make the scale read 1 kg, calculate what the minor marks represent up to that mark) |
| **Strands and content descriptions for teaching** | **Emerging** | **Developing** | **Demonstrating** | **Advancing** | **Extending** |
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| **Relevant part of the Achievement Standard** | **They convert between units of time. (MS4.6)** | | | | |
| Using units of measurement  [*ACMMG085*](http://www.australiancurriculum.edu.au/Elements/ACMMG085) | **Students are beginning to:**   * **Describe** the relationship between some pairs of units (e.g. say that there are 7 days in 1 week; there are 60 seconds in 1 minute; or there are 24 hours in 1 day) | **Students are developing the ability to:**   * **Recall** the relationship between some units and use that to work out other facts (e.g. know that there 12 months in 1 year, so in 2 years, there will be 24 months) | They **independently**:   * **Identify** the correct operation for converting units of time * **Use** the correct operation for converting units of time (e.g. say that multiplication and division are used when converting between units of the same measure) | Students:   * **Explain** why multiplication would be used instead of division (or vice versa) when converting between specific pairs of time units | Students:   * **Solve problems** involving the conversion of units of time (e.g. work out how many 10 minute interviews can be held between 4:00 p.m. and 6 p.m.) |
| **Strands and content descriptions for teaching** | **Emerging** | **Developing** | **Demonstrating** | **Advancing** | **Extending** |
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| **Relevant part of the Achievement Standard** | **They solve problems involving time duration. (MKU4.7)** | | | | |
| Using units of measurement  [*ACMMG086*](http://www.australiancurriculum.edu.au/Elements/ACMMG086) | **Students are beginning to:**   * **Recognise** that the day can be partitioned into two 12-hour sections and use the analogue clock to support that reasoning | **Students are developing the ability to:**   * **Maintain** a simple daily diary that separates events occurring before 12 noon from those after that time * **Link and describe** events occurring before noon and those occurring after noon to a.m. and p.m. times | They **independently**:   * **Use** a.m. and p.m. notation to identify specific times during the day   **Solve** simple time problems (e.g. calculate the time required to travel between two locations; determine arrival time given departure time and the duration of the travel) | Students:   * **Create** records that identify times and durations of events to the hour and half hour during the day (e.g. prepare a schedule of the activities occurring during a school day and work out the duration of each event) | Students:   * **Create and maintain** a diary of events over the period of one term to the nearest quarter hour (e.g. prepare a report of the events covered during a particular week, including the frequency and duration of those events) |
| **Strands and content descriptions for teaching** | **Emerging** | **Developing** | **Demonstrating** | **Advancing** | **Extending** |
| Beginning to work towards the achievement standard | Working towards the achievement standard | Demonstrating the achievement standard | Working beyond the achievement standard | Extending with depth beyond the achievement standard |
| **Relevant part of the Achievement Standard** | **Students compare areas of regular and irregular shapes using informal units. (MKU4.6)** | | | | |
| Using units of measure  [*ACMMG087*](http://www.australiancurriculum.edu.au/Elements/ACMMG087)  [*ACMMG290*](http://www.australiancurriculum.edu.au/Elements/ACMMG290) | **Students are beginning to:**   * **Compare** the areas of two surfaces by direct comparison (e.g. place one surface directly over the other and check whether one is larger than the other) * **Compare** the volumes of two objects by filling both with the same substance (e.g. use sand or something similar to fill two containers and check whether one requires more sand than the other) | **Students are developing the ability to:**   * **Investigate** the use of different plastic grids to cover shapes and work out the area by counting * **Recognise** that shapes need to be covered by the same grid if their areas are to be compared using this technique * **Recognise** that fractions of squares may need to be counted when comparing pairs of shapes using a square centimetre grid (e.g. say that there are 12 whole squares and 6 half-squares, making a total of 15 whole squares) * **Investigate** the method of comparing the volumes of different objects by filling them with smaller objects such as marbles and counting the no. required | They **independently:**   * **Compare** the areas of regular and irregular shapes by informal means (e.g. counting the number of square centimetres required to cover two areas by overlaying the areas with a plastic grid of centimetre squares) * **Compare** the area of two surfaces using grid paper * **Compare** the volume of two objects such as boxes using familiar units such as centicubes * **Recognise** that a range of units other than the common metric units can be used for measuring area (e.g. know that houses in Australia often have their floor areas described using ‘squares’) | Students:   * **Make reasonable estimates** of the areas of shapes drawn on paper using square metres (e.g. use the size of a shape with a known area of 100 square centimetres such as a 10 cm by 10 cm square, to make estimates of the areas of other shapes) * **Recognise the relationship** between the multiplication facts, square centimetre grids and the areas of various rectangles measured in centimetres (e.g. say that a 4 by 3 rectangle has an area of 12; or that a 5 by 8 rectangle has an area of 40 and use the grid to support this reasoning) | Students:   * **Identify and describe** in own words, the relationship between the length, breadth and area of any rectangular shape using a square centimetre grid for support * **Recognise and explain** that the units used to measure the areas of shapes must be different from those measuring lengths of sides and that they should be units such as square centimetres |
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| **Relevant part of the Achievement Standard** | **Students create symmetrical shapes and patterns. (MS4.7)** | | | | |
| Shape  [*ACMMG088*](http://www.australiancurriculum.edu.au/Elements/ACMMG088)  *Location and transformation*  [*ACMMG091*](http://www.australiancurriculum.edu.au/Elements/ACMMG091) | **Students are beginning to:**   * **Create models** of the common 2D shapes and identify some of those with additional features (e.g. make drawings of several different triangles including one with a square corner, one with two sides the same length, one with all sides the same length, and one with all sides different) | **Students are developing the ability to:**   * **Investigate designs** from various cultures and identify any common shapes used in the designs and whether the designs show any symmetry * **Create simple designs** that are symmetrical and use some of the common 2D shapes | They **independently**:   * **Compare** and **describe** two dimensional shapes that result from combining and splitting common shapes ( with and without the use of digital technologies) * **Identify** common two-dimensional shapes that are part of a composite shape by re-creating it from these shapes * **Create** a two-dimensional shapes from verbal or written instructions * **Create** symmetrical patterns, pictures and shapes ( with and without technologies) | Students:   * **Interpret** given designs such as those constructed using *tangrams* and work out ways to copy and re-construct those shapes   **Research** the art / craft of other cultures to identify and describe the use of shapes and symmetry in those works | Students:   * **Use technology** to experiment with the movement of shapes such as using transformations to create new patterns or designs and to study shapes in different orientations |
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| **Relevant part of the Achievement Standard** | **They classify angles in relation to a right angle. (MS4.8)** | | | | |
| Geometric reasoning  [*ACMMG089*](http://www.australiancurriculum.edu.au/Elements/ACMMG089) | **Students are beginning to:**   * **Identify** square corners in shapes and objects and refer to them as right angles | **Students are developing the ability to:**   * **Draw** shapes and create objects that include right angles * **Use efficient methods** (including the use of set squares) to measure and confirm whether specific angles are right angles | They **independently**:   * **Compare** angles and classify them as equal to, greater than or less than a right angle * **Create** angles and compare them to a right angle using digital technologies | Students:   * **Experiment** with the use of set squares where the angle measures are known and also the use of a circular protractor to explore angles of various sizes (e.g. draw a diagram to show that when using a 30/60/90 set square, three of the smallest angle (30° fit neatly into the largest angle 90°) * **Use the term** *degrees* appropriately when describing the measures of known angles | Students:   * **Use appropriate instruments** including set squares and circular protractors to draw angles of various sizes and compare them to right angles |
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| **Relevant part of the Achievement Standard** | **They interpret information contained in maps. (MKU4.8)** | | | | |
| Location and transformation  [ACMMG090](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMMG090) | **Students are beginning to**   * **Recognis**e that no maps or grids represent the actual land size and locate the scale used when creating them * **Create simple** maps or grids of a familiar environment such as the classroom or a bedroom and discuss the use of a scale | **Students are developing the ability to:**   * **Identify and describe** some of the key features used when creating maps and grids, including legends and scales (e.g. use the legend to interpret the meaning of the symbols used on a grid) * **Explain the meaning** of some simple scales used on maps and grids (e.g. say that a scale of 1:100 means that each centimetre of the map corresponds to 100 cm or 1 m on the real site) | **They independently**   * **Use simple scales, legends and directions to interpret** information contained in basic maps (e.g. read the legend and interpret the scale to work out how far apart two features are located) * **Identify** the scale used on maps of cities and rural areas * **Create and follow** directions to locate specific features on a map | **Students:**   * **Create** maps of the local environment and include directions about pathways through those maps (e.g. create a map of the playground together with a set of directions that guides other students to secret messages or to objects that have been hidden) | **Students**:   * **Create sets** of directions using the main features of maps, especially the scale, when planning directions and taking measurements (e.g. plan a route to tour the school, making appropriate distance measurements towards or around important features, then make the necessary conversions with the scale) |

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| **Relevant part of the Achievement Standard** | **Students list the probabilities of everyday events. (MS4.9)** | | | | |
| **Statistics and Probability**    Chance  [*ACMSP092*](http://www.australiancurriculum.edu.au/Elements/ACMSP092) | **Students are beginning to:**   * **Use** the language of chance appropriately during everyday conversations (e.g. say that it is unlikely that we will be allowed on the school oval to play because it’s raining) | **Students are developing the ability to:**   * **Compare and describe** the likelihood of familiar events using everyday language (e.g. say that their team has the better chance of winning the relay because they have the fastest runners in the class) | They **independently:**   * **Describe** possible everyday events and order their chances of occurring (e.g. use lists of familiar events and order them from ‘least likely’ to ‘most likely’ to occur) | Students:   * **Explain** why some events are more likely (or less likely) to occur than other and if necessary plan to gather appropriate data to support the explanation | Students:   * **Identify and describe** some events that appear to have an equal chance of occurring (such as tossing a coin, rolling a dice, or picking names from a box and explain why one does not have a greater chance of occurring than the others   **Identify** some fair and unfair situations involving chance and try to explain what makes some unfair (e.g. when picking names out of a box for teams, all names have to be written on paper that is the same size; if the best player’s name was on a larger piece of paper, the ‘picker’ could feel around for it) |
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| **Relevant part of the Achievement Standard** | **Students identify dependent and independent events. (MKU4.9)** | | | | |
| Chance  [*ACMSP093*](http://www.australiancurriculum.edu.au/Elements/ACMSP093)  [*ACMSP094*](http://www.australiancurriculum.edu.au/Elements/ACMSP094) | **Students are beginning to:**   * **Identify** common events where the result can be either of two possibilities (e.g. know that an answer to an addition fact will be right or wrong; or say that a light can be on or off; or that a coin toss can be a head or a tail) | **Students are developing the ability to:**   * **Conduct** chance experiments such as tossing a coin or rolling a dice and describe the results (e.g. say that the outcomes can only be a head or tail and they are likely to occur about the same number of times after a large number of tosses)   **Identify and describe** some or all of the possible outcomes of common chance events (e.g. say that rolling a dice can result in a 1, 2, 3, 4, 5 or 6 being thrown) | They **independently:**   * **identify** everyday events where one cannot happen if the other happens (e.g. weather – cannot be wet and dry at the same time) * **identify** events where the chance of one will not be affected by the occurrence of the other(e.g. explaining why the probability of a new baby being either a boy or a girl does not depend on the gender of the previous baby; or when rolling a dice, the next roll is not affected by any previous rolls) | Students:   * **Plan and conduct** simple experiments to gather data about familiar chance events (e.g. toss a coin 50 times and record the order of the outcomes and the final tally) * **Make simple statements** about the results of experiments based on the data collected (e.g. we predicted that 6 was the hardest number to roll on a dice, but it was nearly rolled the most) | Students:   * **Recognise and explain** that outcomes do not necessarily occur in turn or as might be expected (e.g. say that just because a head has been tossed, done not mean that a tail will be tossed on the next turn, and that several heads / tails might occur in a row) |
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| **Relevant part of the Achievement Standard** | **They describe different methods for data collection and representation, and evaluate their effectiveness. (MKU4.10)** | | | | |
| Data representation and interpretation  [*ACMMSP095*](http://www.australiancurriculum.edu.au/Elements/ACMSP095)  [*ACMMSP097*](http://www.australiancurriculum.edu.au/Elements/ACMSP097) | **Students are beginning to:**   * **Demonstrate awareness** that the collection of data about any topic needs to be well planned (e.g. say that to answer a question about healthy eating, data should be collected from both children and adults) | **Students are developing the ability to:**   * **Make sensible suggestions** about the questions that should be asked about specific topics (e.g. say that to find out how families feel about climate change, questions might focus on the things that concern their family and what they have done within their own families relating to the issue) * **Experiment** with ways of recording data collected about specific issues and make changes if a better way is identified (e.g. using tally marks makes the count easier, especially if each category is separate in a table) | They **independently:**   * **Select** and **tria**l methods for data collection, including survey questions and recording sheets * **Compare** the effectiveness of different methods of collecting data * **Choose** the most effective way to collect data for a given investigation * **Evaluate** the effectiveness of different displays in illustrating data features including variability (e.g. check that the data collected about a particular topic includes data from all key sources such as boys and girls from various age groups, before making statements about children’s different views on the topic) * **Interpre**t data representations in the media and other forums in which symbols represent more than one data value * **Suggest** **questions** that can be answered by a given data display * **Use** data display to answer questions | Students:   * **Make suggestions** about questions for a class survey and test each question to see how people might answer it (e.g. say that one particular trialled question was no good because many people’s answers did not relate to the survey topic) | Students:   * **Explain** why the group responding to any survey needs careful thought and **make suggestions** about possible changes (e.g. suggest that more parents should be asked to respond because the only adults asked in a current survey about family holiday destinations were teachers) |
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| **Relevant part of the Achievement Standard** | **They construct data displays from given or collected data. (MS4.10)** | | | | |
| Data representation and interpretation  [*ACMMSP096*](http://www.australiancurriculum.edu.au/Elements/ACMSP096) | **Students are beginning to:**   * **Create** simple displays of data that has been collected and organised appropriately (e.g. create a column graph to display data collected about the numbers of cars passing the school gate between 9:30 and 9:45 each day during one week) * **Read and describe** the data displayed in picture graphs that involve a one-to-one relationship | **Students are developing the ability to:**   * **Recognise** that data can be displayed in several ways and demonstrate some of these (e.g. examine data presented in list form, in a table and as a column graph and describe how they are different) | They **independently:**   * **Construct** suitable data displays ( with and without the use of digital technologies) from given or collected data ( e.g. tables, column graphs and picture graphs where one picture can represent many data values) * **Explore** ways of presenting data * **Show**  the results of a given investigation * **Investigate** data displays using many-to-one correspondence | Students:   * **Experiment** with different data displays to check whether one showed the data better than the others (e.g. use technology to test whether a column graph, a circle graph or a basic table represented the clearest picture of some data about colours of cars) | Students:   * **Experiment** with the value of one symbol in a ‘many-to-one’ graph to check whether a particular choice resulted in no part-symbols (e.g. say that if 1 symbol represented 3 cars in data about colours: red 12; white 15; green 6 and yellow 3; then each colour would have all complete symbols; but if one symbol represented 5 cars, then most would involve fractions of symbols) |