



# Bethania Lutheran School

## Mathematics Learning Goals, 4-6

	Year 4	Year 5	Year 6
<b>Number and Number Concepts</b>	Students will develop their understanding of number and place value by comparing, classifying, ordering, partitioning and regrouping numbers.	Students will choose appropriate technologies or strategies to demonstrate an understanding of number.	<p>Students will create number lines which will identify number patterns, and be able to explain the properties that define prime, square, triangular numbers and integers, fractions, decimals and percentages.</p> <p>Students will be able to use number lines to show a knowledge of sequences for integers, fractions, decimals and number.</p>
<b>Operations</b>	<p>Students will develop fluency in multiplication and division facts including counting in multiples.</p> <p>Students will investigate a variety of strategies for solving multiplication and division algorithms.</p> <p>Students will accurately interpret word problems and convert them to number sentences.</p>	Students will select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers. Students use mathematical logic to assess meaning and check reasonableness of thinking in a range real life and problem based experiences.	Students will select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers. Students will be able to work with powers of ten in order to multiply and divide decimals.

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<p><b>Fractions</b></p>	<p>Students will identify equivalent fractions using both common and decimal notation.</p> <p>Students will place fractions on a number line extending from fractional numbers (hundredths) to whole numbers (mixed fractions).</p>	<p>Students will compare and order common unit fractions and place them on a number line.</p>	<p>Students will investigate and demonstrate the connection between fractions, percentage and decimals.</p> <p>Students will investigate and demonstrate the ability to calculate percentage discounts with and without digital technology.</p> <p>Students will be able to use mental and written strategies to solve problems using all 4 operations with fractions.</p> <p>Students will be able to use mental and written strategies to solve problems using all 4 operations with decimals.</p> <p>Students will be able to use mental and written strategies to solve problems using all 4 operations with percentage.</p>
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<p><b>Patterns &amp; Algebra</b></p>	<p>Students will develop knowledge of algebraic equations to solve incomplete number sentences.</p> <p>Students will identify and continue number patterns when exploring multiplication.</p>	<p>Students will continue and create sequences involving whole numbers, fractions and decimals and be able to describe the rule used to create the sequence.</p> <p>Students will explore the use of brackets and order of operations to write number sentences.</p>	<p>Students will continue and create sequences involving whole numbers, fractions and decimals and be able to describe the rule used to create the sequence.</p> <p>Students will explore the use of brackets and order of operations to write number sentences.</p> <p>Students will know the use of brackets and the order of operations when working with number sentences.</p>
<p><b>Money</b></p>	<p>Students will investigate and solve purchasing problems including the calculation of change.</p>	<p>Students will create financial goals and budgets in real life situations and identify GST components of purchases.</p>	<p>Students will investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies.</p>
<p><b>Measurement</b></p>	<p>Students will calculate and compare the areas and volumes of shapes.</p> <p>Students will use a variety of instruments to calculate and compare units of measurement.</p>	<p>Students will compare units of measurement to demonstrate understanding and manipulate length, capacity and mass measurements.</p>	<p>Students will be able to demonstrate the ability to compare and convert units of measurement of area and length, volume and capacity and mass.</p>

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			Students will investigate and be able to show the connection between fractions, percentage and decimals and representation to metric system of measurement, time and money.
<b>Time</b>	<p>Students will demonstrate their understanding of time by using am and pm notation and converting between units of time.</p> <p>Students will investigate and solve simple time problems.</p>	<p>Students will compare 12 and 24 hour time and convert between them.</p> <p>Students will measure events using units of seconds, minutes and hours.</p>	Students will interpret and use timetables.
<b>Shape &amp; Geometry</b>	<p>Students will visualise and name the attributes of 2D shapes including symmetry.</p> <p>Students will recognise and represent acute, right and obtuse angles.</p>	Students will choose appropriate strategies to work geometrically in order to demonstrate understanding of 2D shapes, symmetry and angles.	<p>Students will investigate and be able to construct simple prisms and pyramids.</p> <p>Students will investigate angles, also with digital technologies.</p>
<b>Location &amp; Transformation</b>	Students will understand, interpret and use basic mapping skills.	Students will develop skills of mapping, location and direction using a range of strategies.	<p>Students will have some familiarity with the four quadrants of the Cartesian coordinate system.</p> <p>Students will become familiar with translations, reflections and rotations with and without digital technologies.</p>

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<b>Statistics &amp; Probability</b>	Students will describe and order the likelihood of events, identifying the situations that are dependent and independent on other occurrences. Students will use a variety of methods to collect and represent data, then evaluate the effectiveness of each.	Students will be able to explain connections between sets of data and make relevant interpretation of context. Students will use mathematical logic to design and interpret chance, probability and data.	Students will be able to describe probabilities.  Students will interpret and compare data using graphs.
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## Year 4 Australian Curriculum Statements

**Students will develop their understanding of number and place value by comparing, classifying, ordering, partitioning and regrouping numbers.**

**Students will identify and continue number patterns when exploring multiplication.**

- Investigate and use the properties of odd and even numbers ([ACMNA071](#))
- Recognise, represent and order numbers to at least tens of thousands ([ACMNA072](#))
- Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems ([ACMNA073](#))
- Explore and describe number patterns resulting from performing multiplication ([ACMNA081](#))

**Students will develop fluency in multiplication and division facts including counting in multiples.**

**Students will investigate a variety of strategies for solving multiplication and division algorithms.**

- Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9 ([ACMNA074](#))
- Recall multiplication facts up to  $10 \times 10$  and related division facts ([ACMNA075](#))
- Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder ([ACMNA076](#))



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**Students will identify equivalent fractions using both common and decimal notation.**

**Students will place fractions on a number line extending from negative numbers (hundredths) to whole numbers (mixed fractions).**

- Investigate equivalent fractions used in contexts ([ACMNA077](#))
- Count by quarters halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line([ACMNA078](#))
- Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation ([ACMNA079](#))

**Students will visualise and name the attributes of 2D shapes including symmetry.**

**Students will understand, interpret and use basic mapping skills. Students will recognise and represent acute, right and obtuse angles.**

- Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies ([ACMMG088](#))
- Use simple scales, legends and directions to interpret information contained in basic maps ([ACMMG090](#))
- Create symmetrical patterns, pictures and shapes with and without digital technologies ([ACMMG091](#))
- Compare angles and classify them as equal to, greater than or less than a right angle ([ACMMG089](#))

**Students will develop knowledge of algebraic equations to solve incomplete number sentences.**

- Use equivalent number sentences involving addition and subtraction to find unknown quantities ([ACMNA083](#))

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**Students will calculate and compare the areas and volumes of shapes.**

- Compare objects using familiar metric units of area and volume ([ACMMG290](#))
- Compare the areas of regular and irregular shapes by informal means ([ACMMG087](#))

**Students will demonstrate their understanding of time by using am and pm notation and converting between units of time.**

**Students will investigate and solve simple time problems**

- Convert between units of time ([ACMMG085](#))
- Use am and pm notation and solve simple time problems ([ACMMG086](#))

**Students will investigate and solve purchasing problems including the calculation of change.**

**Students will accurately interpret word problems and convert them to number sentences**

- Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies ([ACMNA080](#))
- Solve word problems by using number sentences involving multiplication or division where there is no remainder ([ACMNA082](#))

**Students will describe and order the likelihood of events, identifying the situations that are dependent and independent on other occurrences.**

**Students will use a variety of methods to collect and represent data, then evaluate the effectiveness of each.**

- Describe possible everyday events and order their chances of occurring ([ACMSP092](#))

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- Identify everyday events where one cannot happen if the other happens ([ACMSP093](#))
- Identify events where the chance of one will not be affected by the occurrence of the other ([ACMSP094](#))
- Select and trial methods for data collection, including survey questions and recording sheets ([ACMSP095](#))
- Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values ([ACMSP096](#))
- Evaluate the effectiveness of different displays in illustrating data features including variability ([ACMSP097](#))

**Students will use a variety of instruments to calculate and compare units of measurement.**

- Use scaled instruments to measure and compare lengths, masses, capacities and temperatures ([ACMMG084](#))

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## Year 5 Australian Curriculum Statements

**Students will select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers.**

**Students will choose appropriate technologies or strategies to construct an understanding of number.**

- Identify and describe factors and multiples of whole numbers and use them to solve problems ([ACMNA098](#))
- Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies ([ACMNA100](#))
- Solve problems involving division by a one digit number, including those that result in a remainder ([ACMNA101](#))
- Use efficient mental and written strategies and apply appropriate digital technologies to solve problems ([ACMNA291](#))
- Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator ([ACMNA103](#))
- Use equivalent number sentences involving multiplication and division to find unknown quantities ([ACMNA121](#))
- Calculate the perimeter and area of rectangles using familiar metric unit. ([ACMMG109](#))

**Students use mathematical logic to assess meaning and check reasonableness of thinking in a range real life and problem based experiences.**

**Students will create financial goals and budgets in real life situations and identify GST components of purchases.**

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- Create simple financial plans ([ACMNA106](#))
- Use estimation and rounding to check the reasonableness of answers to calculations ([ACMNA099](#))

**Students will be able to explain connections between sets of data and make relevant interpretation of context to construct meaning.**

- Pose questions and collect categorical or numerical data by observation or survey ([ACMSP118](#))
- Describe and interpret different data sets in context ([ACMSP120](#))

**Students will continue and create sequences involving whole numbers, fractions and decimals and be able to describe the rule used to create the sequence.**

**Students will explore the use of brackets and order of operations to write number sentences.**

**Students will compare and order common unit fractions and place them on a number line.**

- Compare and order common unit fractions and locate and represent them on a number line ([ACMNA102](#))
- Recognise that the place value system can be extended beyond hundredths ([ACMNA104](#))
- Compare, order and represent decimals ([ACMNA105](#))
- Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction ([ACMNA107](#))

**Students will compare units of measurement to help them construct meaning of length, capacity and mass Compare 12- and 24-hour time systems and convert between them.**

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- Choose appropriate units of measurement for length, area, volume, capacity and mass ([ACMMG108](#))
- Compare 12- and 24-hour time systems and convert between them ([ACMMG110](#))

**Students will develop skills of mapping, location and direction using a range of strategies.**

- Use a grid reference system to describe locations. Describe routes using landmarks and directional language ([ACMMG113](#))

**Students will choose appropriate strategies to work geometrically in order to make meaning of 2D shapes, symmetry and angles.**

- Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries ([ACMMG114](#))
- Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original ([ACMMG115](#))
- Estimate, measure and compare angles using degrees. Construct angles using a protractor ([ACMMG112](#))
- Connect three-dimensional objects with their nets and other two-dimensional representations ([ACMMG111](#))

**Students will use mathematical logic to design and interpret chance, probability and data to construct meaning.**

- List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions ([ACMSP116](#))
- Recognise that probabilities range from 0 to 1 ([ACMSP117](#))
- Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies ([ACMSP119](#))

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## Year 6 Australian Curriculum Statements

**Students will create number lines which will identify number patterns, and be able to explain the properties that define prime, square, triangular numbers and integers, fractions, decimals and percentages,**

**Students will be able to use number lines to show a knowledge of sequences for integers, fractions, decimals and number.**

**Students will continue and create sequences involving whole numbers, fractions and decimals and be able to describe the rule used to create the sequence**

**Students will select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers**

- Identify and describe properties of prime, composite, square and triangular numbers (ACMNA122)
- Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers (ACMNA123)
- Investigate everyday situations that use integers. Locate and represent these numbers on a number line (ACMNA124)
- Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence (ACMNA133)
- Compare fractions with related denominators and locate and represent them on a number line (ACMNA125)

**Students will be able to demonstrate the ability to compare and convert units of measurement of area and length, volume and capacity and mass.**

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**Students will investigate and be able to show the connection between fractions, percentage and decimals and representation to metric system of measurement, time and money.**

- Connect decimal representations to the metric system (ACMMG135)
- Convert between common metric units of length, mass and capacity (ACMMG136)
- Solve problems involving the comparison of lengths and areas using appropriate units (ACMMG137)
- Connect volume and capacity and their units of measurement (ACMMG138)

**Students will become familiar with translations, reflections and rotations with and without digital technologies.**

**Students will have some familiarity with the four quadrants of the Cartesian coordinate system.**

- Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies (ACMMG142)
- Introduce the Cartesian coordinate system using all four quadrants (ACMMG143)

**Students will investigate and be able to construct simple prisms and pyramids.**

- Construct simple prisms and pyramids (ACMMG140)

**Students will investigate angles, also with digital technologies.**

- Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles (ACMMG141)

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**Students will be able to describe probabilities. Students will interpret and compare data using graphs.**

- Describe probabilities using fractions, decimals and percentages (ACMSP144)
- Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies (ACMSP145)
- Compare observed frequencies across experiments with expected frequencies (ACMSP146)
- Interpret and compare a range of data displays, including side by side column graphs for two categorical variables (ACMSP147)
- Interpret secondary data presented in digital media and elsewhere (ACMSP148)

**Students will investigate and demonstrate the connection between fractions, percentage and decimals.**

**Students will investigate and demonstrate the ability to calculate percentage discounts with and without digital technology.**

**Students will investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies**

- Make connections between equivalent fractions, decimals and percentages (ACMNA131)
- Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies (ACMNA132)

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Students will be able to use mental and written strategies to solve problems using all 4 operations with whole numbers.

Students will be able to use mental and written strategies to solve problems using all 4 operations with fractions.

Students will be able to use mental and written strategies to solve problems using all 4 operations with decimals.

Students will be able to use mental and written strategies to solve problems using all 4 operations with percentage.

Students will be able to use mental and written strategies to solve problems using all 4 operations with measurement.

Students will know the use of brackets and the order of operations when working with number sentences.

Students will explore the use of brackets and order of operations to write number sentences.

Students will be able to work with powers of ten in order to multiply and divide decimals

- Solve problems involving addition and subtraction of fractions with the same or related denominators (ACMNA126)
- Add and subtract decimals, with & without digital technologies, & use estimation and rounding to check the reasonableness of answers (ACMNA128)
- Multiply decimals by whole numbers and perform divisions by nonzero whole numbers where the results are terminating decimals, with and without digital technologies (ACMNA129)

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- Explore the use of brackets and order of operations to write number sentences (ACMNA134)
- Multiply and divide decimals by powers of 10 (ACMNA130)
- Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies (ACMNA127)

## **Students will interpret and use timetables**

- Interpret and use timetables (ACMMG139)

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