Good Shepherd
Lutheran School
ANGASTON

Math Policy

Last Reviewed 2011

1. Rationale

Learning mathematics creates opportunities for and enriches the lives of all Australians. Good Shepherd has adopted the *Australian Curriculum*. Mathematics provides students with essential mathematical skills and knowledge in *Number and Algebra*, *Measurement and Geometry*, and *Statistics and Probability*. It develops the numeracy capabilities that all students need in their personal, work and civic life, and provides the fundamentals on which mathematical specialties and professional applications of mathematics are built.

Mathematics has its own value and beauty and this curriculum aims to instil in students an appreciation of the elegance and power of mathematical reasoning. Mathematical ideas have evolved across all cultures over thousands of years, and are constantly developing. Digital technologies are facilitating this expansion of ideas and providing access to new tools for continuing mathematical exploration and invention. The curriculum focuses on developing increasingly sophisticated and refined mathematical understanding, fluency, logical reasoning, analytical thought and problem-solving skills. These capabilities enable students to respond to familiar and unfamiliar situations by employing mathematical strategies to make informed decisions and solve problems efficiently.

The Australian mathematics curriculum at Good Shepherd ensures that the links between the various components of mathematics, as well as the relationship between mathematics and other disciplines, are made clear. Mathematics is composed of multiple but interrelated and interdependent concepts and systems which students apply beyond the mathematics classroom. In science, for example, understanding sources of error and their impact on the confidence of conclusions is vital, as is the use of mathematical models in other disciplines. In geography, interpretation of data underpins the study of human populations and their physical environments; in history, students need to be able to imagine timelines and time frames to reconcile related events; and in English, deriving quantitative and spatial information is an important aspect of making meaning of texts.

The curriculum ensures all students at Good Shepherd will benefit from access to the power of mathematical reasoning and learn to apply their mathematical understanding creatively and efficiently. The mathematics curriculum provides students with carefully paced, in-depth study of critical skills and concepts. It encourages teachers to help students become self-motivated, confident learners through inquiry and active participation in challenging and engaging experiences.

2. Aims

The Australian mathematics curriculum at Good Shepherd aims to ensure that students at Good Shepherd:

- are confident, creative users and communicators of mathematics, able to investigate, represent and interpret situations in their personal and work lives and as active citizens
- develop an increasingly sophisticated understanding of mathematical concepts and fluency with processes, and are able to pose and solve problems and reason in *Number and Algebra, Measurement and Geometry, and Statistics and Probability*
- recognise connections between the areas of mathematics and other disciplines and appreciate mathematics as an accessible and enjoyable discipline to study

3. Content structure

The Australian mathematic curriculum is organised around the interaction of three content strands and four proficiency strands.

The content strands are *Number and Algebra*, *Measurement and Geometry*, and *Statistics and Probability*. They describe what is to be taught and learnt.

The proficiency strands are *Understanding*, *Fluency*, *Problem Solving*, and *Reasoning*. They describe how content is explored or developed, that is, the thinking and doing of mathematics. They provide the language to build in the developmental aspects of the learning of mathematics and have been incorporated into the content descriptions of the three content strands described above. This approach has been adopted to ensure students' proficiency in mathematical skills develops throughout the curriculum and becomes increasingly sophisticated over the years of schooling.

Content strands

Number and Algebra

Number and Algebra are developed together, as each enriches the study of the other. Students apply number sense and strategies for counting and representing numbers. They explore the magnitude and properties of numbers. They apply a range of strategies for computation and understand the connections between operations. They recognise patterns and understand the concepts of variable and function. They build on their understanding of the number system to describe relationships and formulate generalisations. They recognise equivalence and solve equations and inequalities. They apply their number and algebra skills to conduct investigations, solve problems and communicate their reasoning.

Measurement and Geometry

Measurement and Geometry are presented together to emphasise their relationship to each other, enhancing their practical relevance. Students develop an increasingly sophisticated understanding of size, shape, relative position and movement of two-dimensional figures in the plane and three-dimensional objects in space. They investigate properties and apply their understanding of them to define, compare and construct figures and objects. They learn to develop geometric arguments. They make meaningful measurements of quantities, choosing appropriate metric units of measurement. They build an understanding of the connections between units and calculate derived measures such as area, speed and density.

Statistics and Probability

Statistics and Probability initially develop in parallel and the curriculum then progressively builds the links between them. Students recognise and analyse data and draw inferences. They represent, summarise and interpret data and undertake purposeful investigations involving the collection and interpretation of data. They assess likelihood and assign probabilities using experimental and theoretical approaches. They develop an increasingly sophisticated ability to critically evaluate chance and data concepts and make reasoned judgments and decisions, as well as building skills to critically evaluate statistical information and develop intuitions about data.

Proficiency strands

The proficiency strands describe the actions in which students can engage when learning and using the content. While not all proficiency strands apply to every content description, they indicate the breadth of mathematical actions that teachers can emphasise.

Understanding

Students build a robust knowledge of adaptable and transferable mathematical concepts. They make connections between related concepts and progressively apply the familiar to develop new ideas. They develop an understanding of the relationship between the ‘why’ and the ‘how’ of mathematics. Students build understanding when they connect related ideas, when they represent concepts in different ways, when they identify commonalities and differences between aspects of content, when they describe their thinking mathematically and when they interpret mathematical information.

Fluency

Students develop skills in choosing appropriate procedures, carrying out procedures flexibly, accurately, efficiently and appropriately, and recalling factual knowledge and concepts readily. Students are fluent when they calculate answers

efficiently, when they recognise robust ways of answering questions, when they choose appropriate methods and approximations, when they recall definitions and regularly use facts, and when they can manipulate expressions and equations to find solutions.

Problem Solving

Students develop the ability to make choices, interpret, formulate, model and investigate problem situations, and communicate solutions effectively. Students formulate and solve problems when they use mathematics to represent unfamiliar or meaningful situations, when they design investigations and plan their approaches, when they apply their existing strategies to seek solutions, and when they verify that their answers are reasonable.

Reasoning

Students develop an increasingly sophisticated capacity for logical thought and actions, such as analysing, proving, evaluating, explaining, inferring, justifying and generalising. Students are reasoning mathematically when they explain their thinking, when they deduce and justify strategies used and conclusions reached, when they adapt the known to the unknown, when they transfer learning from one context to another, when they prove that something is true or false and when they compare and contrast related ideas and explain their choices.

Content descriptions

The mathematics curriculum includes content descriptions at each year level. These describe the knowledge, concepts, skills and processes that teachers are expected to teach and students are expected to learn. However, they do not prescribe approaches to teaching. The content descriptions are intended to ensure that learning is appropriately ordered and that unnecessary repetition is avoided. However, a concept or skill introduced at one year level may be revisited, strengthened and extended at later year levels as needed.

Sub-strands

Content descriptions are grouped into sub-strands to illustrate the clarity and sequence of development of concepts through and across the year levels. They support the ability to see the connections across strands and the sequential development of concepts from Foundation to Year 7.

Number and Algebra	Measurement and Geometry	Statistics and Probability
Number and place value (F-7)	*Using units of measurement (F-7)*	*Chance (1-7)*
Fractions and decimals (1-6)	*Shape (F-7)*	*Data representation and interpretation (F-7)*
Real numbers (7)	*Geometric reasoning (3-7)*	
Money and financial mathematics (1-7)	*Location and transformation (F-7)*	
Patterns and algebra (F-7)		

Year level descriptions

Year level descriptions emphasise the importance of working mathematically within the content. They provide an overview of the relationship between the proficiencies (*Understanding, Fluency, Problem Solving* and *Reasoning*) and the content for each year level.

Content elaborations

Content elaborations are provided for Foundation to Year 7 to illustrate and exemplify content and assist teachers to develop a common understanding of the content descriptions. They are not intended to be comprehensive content points that all students need to be taught. (To be found at www.australiancurriculum.edu.au).

Glossary

A glossary is provided to support the common understanding of key terms in the content descriptions.

This support document contains additional information to support the glossary.

(To be found at www.australiancurriculum.edu.au).

4. Mathematics across Foundation to Year 7

Although the curriculum is described year by year, this document provides advice across four year groupings on the nature of learners and the relevant curriculum:

- Foundation – Year 2: typically students from 5 to 8 years of age
- Years 3–6: typically students from 8 to 12 years of age
- Years 7: typically students from 12 to 13 years of age

Foundation – Year 2

The early years (5–8 years of age) lay the foundation for learning mathematics. Students at this level can access powerful mathematical ideas relevant to their current lives and learn the language of mathematics, which is vital to future progression.

Children have the opportunity to access mathematical ideas by developing a sense of number, order, sequence and pattern; by understanding quantities and their representations; by learning about attributes of objects and collections, position, movement and direction, and by developing an awareness of the collection, presentation and variation of data and a capacity to make predictions about chance events.

Understanding and experiencing these concepts in the early years provides a foundation for algebraic, statistical and multiplicative thinking, that will develop in subsequent years. These foundations also enable children to pose basic mathematical questions about their world, to identify simple strategies to investigate solutions, and to strengthen their reasoning to solve personally meaningful problems.

Years 3–6

These years 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 years; 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 years, such as fractions and decimals.
In these years 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.

Year 7

This year of school marks a shift in mathematics learning to more abstract ideas. Through key activities such as the exploration, recognition and application of patterns, the capacity for abstract thought can be developed and the ways of thinking associated with abstract ideas can be illustrated.

The foundations built in previous years prepare students for this change. Previously established mathematical ideas can be drawn upon in unfamiliar sequences and combinations to solve non-routine problems and to consequently develop more complex mathematical ideas. However, students of this age also need an understanding of the connections between mathematical concepts and their application in their world as a motivation to learn. This means using contexts directly related to topics of relevance and interest to this age group.

During this year, students need to be able to represent numbers in a variety of ways; to develop an understanding of the benefits of algebra, through building algebraic models and applications and the various applications of geometry; to estimate and select appropriate units of measure; to explore ways of working with data to allow a variety of representations; and to make predictions about events based on their observations.

The intent of the curriculum is to encourage the development of important ideas in more depth, and to promote the interconnectedness of mathematical concepts. An obvious concern is the preparation of students intending to continue studying mathematics in the senior secondary years. Teachers will, in implementing the curriculum, extend the more mathematically able students by using appropriate challenges and extensions within available topics. A deeper understanding of mathematics in the curriculum enhances a student’s potential to use this knowledge to solve non-routine problems, both at this level of study and at later stages.

5. Achievement Standards

Across Foundation to Year 7, achievement standards indicate the quality of learning that students should typically demonstrate by a particular point in their schooling. Achievement standards comprise a written description and student work samples.

An achievement standard describes the quality of learning (the extent of knowledge, the depth of understanding, and the sophistication of skills) that would indicate the student is well placed to commence the learning required at the next level of achievement.

The sequence of achievement standards across Foundation to Year 7 describes progress in the learning area. This sequence provides teachers with a framework of growth and development in the learning area.

Student work samples play a key role in communicating expectations described in the achievement standards. Each work sample includes the relevant assessment task, the student's response, and annotations identifying the quality of learning evident in the student's response in relation to relevant parts of the achievement standard.

Together, the description of the achievement standard and the accompanying set of annotated work samples help teachers to make judgments about whether students have achieved the standard.

6. Diversity of Learners

The Australian Curriculum has been developed to ensure that curriculum content and achievement standards establish high expectations for all students. Every student is entitled to enriching learning experiences across all areas of the curriculum. Students at Good Shepherd have multiple, diverse and changing needs that are shaped by individual learning histories and abilities as well as cultural language backgrounds and socio-economic factors.

Special education needs

The objectives of the Australian Curriculum are the same for all students. The curriculum offers flexibility for teachers to tailor their teaching in ways that provide rigorous, relevant and engaging learning and assessment opportunities for students with special education needs.

Most students with special education needs can engage with the curriculum provided the necessary adjustments are made to the complexity of the curriculum content and to the means through which students demonstrate their knowledge, skills and understanding.

For some learners, making adjustments to instructional processes and to assessment strategies enables students to achieve educational standards commensurate with their peers.

For other students, teachers will need to make appropriate adjustments to the complexity of the curriculum content, focusing instruction on content different to that taught to others in their age group. It follows that adjustments will also need to be made to how the student's progress is monitored, assessed and reported.

For a small percentage of students, the Foundation to Year 7 curriculum content and achievement standards may not be appropriate nor meaningful, even with adjustments. Most of these students have a significant intellectual disability. During 2011, ACARA will develop additional curriculum content and achievement standards for this group of students in order to provide an Australian Curriculum that is inclusive of every learner.

English as an additional language or dialect

Many students in Australian schools are learners of English as an additional language or dialect (EAL/D). Learners of EAL/D are students whose first language is a language other than Standard Australian English and who require additional support to assist them to develop English language proficiency. While many EAL/D learners do well in school, there is a significant group of these learners who leave school without achieving their potential.

EAL/D students come from diverse backgrounds and may include:

- overseas- and Australian-born children whose first language is a language other than English
- Aboriginal and Torres Strait Islander students whose first language is an Indigenous language, including traditional languages, creoles and related varieties, or Aboriginal English.

EAL/D learners enter Good Shepherd School at different ages and at different stages of English language learning and have various educational backgrounds in their first languages. For some, school is the only place they use English.

The aims of the Australian mathematics curriculum at Good Shepherd are ultimately the same for all students. However, EAL/D learners are simultaneously learning a new language and the knowledge, understanding and skills of the mathematics curriculum through that new language. They require additional time and support, along with informed teaching that explicitly addresses their language needs, and assessments that take into account their developing language proficiency.

A national EAL/D document is being produced that will support the Australian Curriculum. It will provide a description of how language proficiency develops, and will be a valuable reference for all teachers. It will allow mathematics teachers to identify the language levels of the EAL/D learners in their classrooms and to address their specific learning requirements when teaching, ensuring equity of access to the mathematics learning area for all.

7. General capabilities

The skills, behaviours and attributes that students need to succeed in life and work in the twenty-first century have been identified in the Australian Curriculum as general capabilities. There are seven general capabilities:

- literacy
- numeracy
- competence in information and communication technology (ICT)
- critical and creative thinking
- ethical behaviour
- personal and social competence
- intercultural understanding.

Over the course of their schooling, students develop and use these general capabilities within and across learning areas and in their lives outside school. General capabilities and learning areas have a reciprocal relationship. Learning areas provide opportunities for students to develop and use general capabilities. Similarly, wherever general capabilities are made explicit in learning areas, they can enrich and deepen learning. In the Australian mathematics curriculum at Good Shepherd, each of the seven general capabilities is embedded (where appropriate) in the content descriptions or elaborations. There are further opportunities to develop the general capabilities through appropriate teaching activities.

Literacy (L)

Students become literate as they develop the skills to learn and communicate confidently at school and to become effective individuals, community members, workers and citizens. These skills include listening, reading and viewing, writing, speaking and creating print, visual and digital materials accurately and purposefully within and across all learning areas.

Literacy is an important aspect of mathematics. Students need to understand written problems and instructions; ellipsis (for example, ‘convert your age to days, then hours, minutes and finally seconds’); synonyms (for example, ‘subtract’, ‘take away’, ‘minus’); imperatives (for example, ‘circle the correct answer’); the passive voice (for example, ‘if 7 is taken

from 10…'); nominalisations (for example, 'product', 'quotient'); technical terminology (for example, 'digits', 'lowest common denominator'), including the use of common words with a specific meaning in a mathematical context (for example 'find the value of x' requires more than searching, it implies problem solving), and metaphorical language used to express mathematics concepts and processes.

Numeracy (N)

Students become numerate as they develop the capacity to recognise and understand the role of mathematics in the world around them and the confidence, willingness and ability to apply mathematics to their lives in ways that are constructive and meaningful.

Mathematics makes a special contribution to the development of numeracy in a manner that is more explicit and foregrounded than is the case in other learning areas. It is important that the mathematics curriculum provides the opportunity to apply mathematical understanding and skills in context, both in other learning areas and in real world contexts. A particularly important context for the application of *Number and Algebra* is financial mathematics. In *Measurement and Geometry*, there is an opportunity to apply understanding to design. The twenty-first century world is information driven, and through *Statistics and Probability* students can interpret data and make informed judgments about events involving chance.

Information and communication technology (ICT) competence (ICT)

Students develop ICT competence as they learn to use ICT effectively and appropriately when investigating, creating and communicating ideas and information at school, at home, at work and in their communities. ICT competence allows students to solve problems and readily perform previously onerous tasks. Calculators of all types, from the simple four-operations versions to more complex graphical and CAS calculators, can be used to make calculations, draw graphs and interpret data in ways that have previously not been possible. Digital technologies, such as spreadsheets, dynamic geometry software and computer algebra software, can engage students and promote understanding of key concepts. However, there will be occasions where teachers will ask students to undertake tasks without using technology.

Critical and creative thinking (CCT)

Students develop critical and creative thinking as they learn to generate and evaluate knowledge, ideas and possibilities, and use them when seeking new pathways or solutions. In the context of schooling, critical and creative thinking are integral to activities that require reason, logic, imagination and divergence.

Critical and creative thinking is key to the development of mathematical understanding. Critical thinking is used in the proficiency strands of *Reasoning* and *Problem Solving*. Engaging students in reasoning and thinking about solutions to problems, and the strategies needed to find these solutions, are core parts of the mathematics curriculum. For example,

students are encouraged to be critical thinkers in justifying their choice of a particular calculation strategy or in identifying the questions that need to be answered when undertaking a statistical investigation.

Creative thinking is essential to mathematical problem solving. The mathematics curriculum encourages students to look for alternative ways to approach problems. For example, identifying when a problem is similar to a previous one or drawing diagrams or simplifying a problem to control some variables, are strategies students will develop to find solutions.

Ethical behavior (EB)

Students develop ethical behaviour as they learn to understand and act in accordance with ethical principles. This includes understanding the role of ethical principles, values and virtues in human life; acting with moral integrity; acting with regard for others, and having a desire and capacity to work for the common good.

There are opportunities in the mathematics curriculum to develop and apply ethical behaviour in a range of contexts; for example, in the selection and interpretation of data and statistics for different purposes.

Personal and social competence (PSC)

Students develop personal and social competence as they learn to understand and manage themselves, their relationships, lives, work and learning more effectively. This involves recognising and regulating their emotions, developing concern and understanding of others, establishing positive relationships, making responsible decisions, working effectively in teams and handling challenging situations constructively.

The elements of personal and social competence relevant to mathematics include the application of mathematical skills for personal purposes, such as the use of timetables, budgeting and personal problem solving, which are all important skills in self-management.

Students' capacities to work in teams in undertaking explorations and investigations are another important part of learning to be mathematicians.

Intercultural understanding (IU)

Students develop intercultural understanding as they learn to understand themselves in relation to others. This involves students valuing their own cultures and beliefs and those of others, and engaging with people of diverse cultures in ways that recognise commonalities and differences, create connections and cultivate respect between people.

Intercultural understanding can be enhanced if students are exposed to a range of cultural traditions in mathematics. For example, through examining Aboriginal and Torres Strait Islander people's perceptions of time and weather patterns, the networks embedded in family relationships and the algebraic concepts inherent in storytelling students' broader cultural

knowledge is enriched. It is also important for mathematics classes to explore the influences of many cultures in the development of mathematical thinking.

These General Capabilities are identified by their abbreviations in the scope and sequence. (refer to section 13)

8. Cross-curriculum priorities

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.

The cross curriculum priorities are embedded in the curriculum and will have a strong but varying presence depending on their relevance to each of the learning areas.

Aboriginal and Torres Strait Islander histories and cultures

Aboriginal and Torres Strait Islander communities are strong, rich and diverse. Aboriginal and Torres Strait Islander Identity is central to this priority and is intrinsically linked to living, learning Aboriginal and Torres Strait Islander communities, deep knowledge traditions and holistic world view.

A conceptual framework based on Aboriginal and Torres Strait Islander Peoples' unique sense of Identity has been developed as a structural tool for the embedding of Aboriginal and Torres Strait Islander histories and cultures within the Australian curriculum. This sense of Identity is approached through the interconnected aspects of Country/Place, People and Culture. Embracing these elements enhances all areas of the curriculum.

The Aboriginal and Torres Strait Islander priority provides opportunities for all learners to deepen their knowledge of Australia by engaging with the world's oldest continuous living cultures. This knowledge and understanding will enrich their ability to participate positively in the ongoing development of Australia.

The Australian mathematics curriculum at Good Shepherd values Aboriginal and Torres Strait Islander histories and cultures. It provides opportunities for students to appreciate that Aboriginal and Torres Strait Islander societies have sophisticated applications of mathematical concepts.

Students will explore connections between representations of number and pattern and how they relate to aspects of Aboriginal and Torres Strait Islander cultures. They will investigate time, place, relationships and measurement concepts in Aboriginal and Torres Strait Islander contexts. Students will deepen their understanding of the lives of Aboriginal and Torres Strait Islander Peoples through the application and evaluation of statistical data.

Asia and Australia's engagement with Asia

The Asia and Australia's engagement with Asia priority provides a regional context for learning in all areas of the curriculum. China, India and other Asian nations are growing rapidly and the power and influence they have in all areas of global endeavour is extensive. An understanding of Asia underpins the capacity of Australian students to be active and informed citizens working together to build harmonious local, regional and global communities, and build Australia's social, intellectual and creative capital.

This priority is concerned with Asia literacy for all Australian students. Asia literacy develops knowledge, skills and understanding about the histories, geographies, cultures, arts, literatures and languages of the diverse countries of our region. It fosters social inclusion in the Australian community. It enables students to communicate and engage with the peoples of Asia so they can effectively live, work and learn in the region. Australia now has extensive engagement with Asia in areas such as trade, investment, immigration, tourism, education and humanitarian assistance and this engagement is vital to the prosperity of all Australians.

The Australian mathematics curriculum at Good Shepherd provides opportunities for students to learn about the understandings and applications of mathematics in Asia. In the past, mathematicians from the Asia region have made significant contributions to the development of the human understanding of number, algebra and trigonometry. Mathematicians from Asia continue to contribute to the ongoing development of mathematical understanding.

In this learning area, students investigate the concept of chance using Asian games. They explore the way Asian societies apply other mathematical concepts such as patterns and symmetry in art and architecture. Investigations involving data collection and representation can be used to examine issues pertinent to the Asia region.

Sustainability

Sustainability addresses the ongoing capacity of Earth to maintain all life.

Sustainable patterns of living meet the needs of the present without compromising the ability of future generations to meet their needs. Actions to improve sustainability are both individual and collective endeavours shared across local and global communities. They necessitate a renewed and balanced approach to the way humans interact with each other and the environment.

Education for sustainability develops the knowledge, skills and values necessary for people to act in ways that contribute to more sustainable patterns of living. It is futures-oriented, focusing on protecting environments and creating a more ecologically and socially just world through action that recognises the relevance and interdependence of environmental, social, cultural and economic considerations.

The Australian mathematics curriculum at Good Shepherd provides the foundation for the exploration of issues of sustainability. It equips students with the skills of measurement, mathematical modelling, and data collection, representation and analysis. These skills are needed to investigate data, evaluate and communicate findings and to make predictions based on those findings.

Mathematical understandings and skills are necessary to monitor and quantify both the impact of human activity on ecosystems and changes to conditions in the biosphere. Actions to improve sustainability involve students in processes such as auditing, reading measures and gauges, and interpreting data on invoices and accounts. Mathematical and statistical analysis enables informed decision making about present and future action.

Links to Other Learning Areas

Learning in mathematics involves the use of knowledge and skills learnt in other areas, particularly in English, science and history.

The Australian National Numeracy Review Report (2008) identified numeracy as requiring an across-the-school commitment, including mathematical, strategic and contextual aspects. This across-the-school commitment can be managed by including specific references to other curriculum areas in the mathematics curriculum, and the identification of key numeracy capacities in the descriptions of other curriculum areas being developed. For example, the following are some of the numeracy perspectives that could be relevant to English, science and history.

English

One aspect of the link with English and literacy is that, along with other elements of study, numeracy can be understood and acquired only within the context of the social, cultural, political, economic and historical practices to which it is integral. Students need to be able to draw on quantitative and spatial information to derive meaning from certain types of texts encountered in the subject of English.

Science

Practical work and problem solving across all the sciences require the capacity to organise and represent data in a range of forms; plot, interpret and extrapolate graphs; estimate and solve ratio problems; use formulas flexibly in a range

of situations; perform unit conversions; and use and interpret rates including concentrations, sampling, scientific notation, and significant figures.

History

Learning in history includes interpreting and representing large numbers and a range of data such as those associated with population statistics and growth, financial data, figures for exports and imports, immigration statistics, mortality rates, war enlistments and casualty figures; chance events, correlation and causation; imagining timelines and time frames to reconcile related events; and the perception and spatial visualisation required for geopolitical considerations, such as changes in borders of states and in ecology.

9. Implications for teaching, assessment and reporting

In mathematics, challenging problems can be posed using basic age-appropriate content. Accelerating students by using content beyond their year level may not be the best way to extend proficient mathematicians. Choosing engaging experiences as contexts for a variety of tasks assists in making mathematics inclusive, and these tasks can be effectively differentiated both for students experiencing difficulty and those who complete tasks easily. The proficiency strands apply expectations of the range and nature of how mathematical content is enacted, and can help focus teaching.

Teachers at Good Shepherd use the Australian Curriculum content and achievement standards first to identify current levels of learning and achievement and then to select the most appropriate content (possibly from across several year levels) to teach individual students and/or groups of students. This takes into account that in each class there may be students with a range of prior achievement (below, at, and above the year level expectations) and that teachers plan to build on current learning.

Teachers also use the achievement standards, at the end of a period of teaching, to make on-balance judgments about the quality of learning demonstrated by the students – that is whether they have achieved below, at, or above the standard. To make these judgments, teachers draw on assessment data that they have collected as evidence during the course of the teaching period. These judgments about the quality of learning are one source of feedback to students and their parents and inform formal reporting processes.

If a teacher judges that a student's achievement is below the expected standard, this suggests that the teaching programs and practice should be reviewed to better assist individual students in their learning in the future. It also suggests that additional support and targeted teaching will be needed to ensure that the student does not fall behind.

Assessment of the Australian Curriculum at Good Shepherd takes place in different levels and for different purposes, including:

- ongoing formative assessment within classrooms for the purposes of monitoring learning and providing feedback, to teachers to inform their teaching, and for students to inform their learning
- summative assessment for the purposes of twice-yearly reporting by Good Shepherd to parents and carers on the progress and achievement of students
- annual testing of Years 3, 5 and 7students' levels of achievement in aspects of literacy and numeracy, conducted as part of the National Assessment Program – Literacy and Numeracy (NAPLAN)
- periodic sample testing of specific learning areas within the Australian Curriculum as part of the National Assessment Program (NAP).

10. Resources

Effective resources used at Good Shepherd include:

- Scootle (www.scootle.edu.au), teacher to log on
- Ultimate Maths Invaders
- Baggin the Dragon
- Math Blasters
- Mental Computation Folders (Alistair McIntosh)
- Maths equipment in storage area
- Maths reference books in compactus

11. Parents

At enrolment interviews, caregivers are informed about curriculum areas making up the school program and studies in which their students will participate.

Both new and existing caregivers of students of the school are given the ongoing opportunity to learn about the key learning area.

This information may be provided:

- parent information nights
- in printed form, through class and school newsletters
- by teachers according to individual need
- internet access to Australian Curriculum website.

12. Year Level Descriptions - Mathematics

Foundation Year

Foundation Year Level Description

The proficiency strands *Understanding, Fluency, Problem Solving* and *Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra*, *Measurement and Geometry,* and *Statistics and Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year level:

Understanding includes connecting names, numerals and quantities

Fluency includes counting numbers in sequences readily, continuing patterns, and comparing the lengths of objects directly

Problem Solving includes using materials to model authentic problems, sorting objects, using familiar counting sequences to solve unfamiliar problems, and discussing the reasonableness of the answer

Reasoning includes explaining comparisons of quantities, creating patterns, and explaining processes for indirect comparison of length.

Foundation Year Achievement Standard

By the end of the Foundation Year, students make the connections between number names, numerals and quantities up to 10. Students are able to compare and sort shapes and objects. They make connections between events and the days of the week.

Year 1

Year 1 Level Description

The proficiency strands *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra, Measurement and Geometry, and Statistics and Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year level: Understanding includes connecting names, numerals and quantities, and partitioning numbers in various ways

Fluency includes counting number in sequences readily forward and backwards, locating numbers on a line, and naming the days of the week

Problem Solving includes using materials to model authentic problems, giving and receiving directions to unfamiliar places, and using familiar counting sequences to solve unfamiliar problems and discusing the reasonableness of the answer

Reasoning includes explaining direct and indirect comparisons of length using uniform informal units, justifying representations of data, and explaining patterns that have been created

Year 1 Achievement Standard

By the end of Year 1, students recognise and communicate number sequences. They solve simple addition and subtraction problems, and are familiar with Australian coins. They describe a representation of a half. Students collect data from questions to draw and describe simple data displays. Students compare lengths and describe two-dimensional shapes and three-dimensional objects. They communicate time duration and can follow simple directions.

Year 2

Year 2 Level Description

The proficiency strands *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra, Measurement and Geometry,* and *Statistics and Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year level:

Understanding includes connecting number calculations with counting sequences, partitioning and combining numbers flexibly, identifying and describing the relationship between addition and subtraction and between multiplication and division

Fluency includes counting numbers in sequences readily, using units iteratively to compare measurements, listing possible outcomes of chance events, and describing and comparing time durations

Problem Solving includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, planning routes on maps, and matching transformations with their original shape

Reasoning includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations, describing connections between 2-D and 3-D representations, and creating and interpreting simple representations of data

Year 2 Achievement Standard

By the end of Year 2, students recognise and communicate number sequences involving twos threes and fives. They are familiar with collections up to 1000 and recognise the connection between addition and subtraction. Students describe patterns with numbers and represent problems involving addition and subtraction by number sentences. They understand the value of collections of Australian coins. Students collect information and create data displays and interpret the information. They describe outcomes for everyday events.Students compare and order different shapes and objects using informal units. They use calendars to identify dates and seasons. They draw two-dimensional shapes and describe one-step transformations.

Year 3

Year 3 Level Description

The proficiency strands *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra, Measurement and Geometry, and Statistics and Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year level:

Understanding includes connecting number representations with number sequences, partitioning and combining numbers flexibly, representing unit fractions, using appropriate language to communicate times, and identifying environmental symmetry

Fluency includes recalling multiplication facts, using familiar metric units to order and compare objects, identifying and describing outcomes of chance experiments, interpreting maps and communicating positions

Problem Solving includes formulating and modelling authentic situations involving planning methods of data collection and representation, making models of three-dimensional objects and using number properties to continue number patterns

Reasoning includes using generalising from number properties and results of calculations, comparing angles, creating and interpreting variations in the results of data collections and data displays

Year 3 Achievement Standard

By the end of Year 3 students recall number facts for single digit numbers and are familiar with collections up to 10 000. They describe number patterns involving addition and subtraction and recognise the connection between multiplication and division. They model and represent unit fractions. They count the change required and represent money values in various ways.Students conduct chance experiments and describe the possible outcomes. They create, interpret and compare data displays. Students compare objects using familiar units. They compare angle sizes and identify symmetry. They tell the time and interpret positions and pathways on maps.

Year 4

Year 4 Level Description

The proficiency strands *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra, Measurement and Geometry, and Statistics and Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year 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, using informal units for comparing, 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 and 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

Year 4 Achievement Standard

By the end of Year 4 students recall multiplication facts up to 10 x 10 and the related division facts. They are familiar with collections up to 100 000. Students recognise and locate familiar fractions on a number line and make connections between fraction and decimal notations. They solve problems by using relevant number sentences involving the four operations. Students describe the probabilities of everyday events. They investigate different methods for data collection, construct data displays and evaluate their effectiveness. Students convert between units of time and solve problems involving time duration. They compare areas of regular and irregular shapes and classify angles. They create symmetrical patterns and interpret the information contained in maps.

Year 5

Year 5 Level Description

The proficiency strands *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra, Measurement and Geometry, and Statistics and Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year level:

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

Year 5 Achievement Standard

By the end of Year 5 students identify and describe factors and multiples and use estimation and rounding to check the reasonableness of answers. They solve multiplication and division problems and compare, order and represent decimals. Students perform addition and subtraction of fractions with the same denominator and continue patterns with fractions and decimals. They plan simple budgets. Students list the outcomes of chance experiments as fractions. They pose questions to gather data and construct, describe and interpret different data sets. Students calculate perimeter and area of rectangles using appropriate units. They connect three dimensional objects with two dimensional representations. They measure and construct different angles and describe transformations of two-dimensional shapes, including the enlargement transformation. They identify line and rotational symmetry

Year 6

Year 6 Level Description

The proficiency strands *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra, Measurement and Geometry, and Statistics and Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year level:

Understanding includes describing properties of different sets of numbers, using fractions and decimals to describe probabilities, representing fractions and decimals in various ways and describing connections between them, and making reasonable estimations

Fluency includes representing negative numbers on a number line, calculating simple percentages, using brackets appropriately, converting between fractions and decimals, using operations with fractions, decimals and percentages, measuring using metric units, and interpreting timetables

Problem Solving includes formulating and solving authentic problems using numbers and measurements, creating similar shapes through enlargements, representing secondary data, and calculating angles

Reasoning includes explaining mental strategies for performing calculations, describing results for continuing number sequences, investigating new situations using known properties of angles, explaining the transformation of one shape into another, and inferring from the results of experiments

Year 6 Achievement Standard

By the end of Year 6, students recognise the properties of special numbers. They connect fractions, decimals and percentages as different representations of the same number and solve associated problems. They write correct number sentences. Students predict and communicate probabilities using simple fractions, decimals and percentages and construct and interpret a range of data displays. Students connect decimal representations to the metric system and choose appropriate units of measurement to solve problems. They interpret and use timetables. Students investigate angles. They investigate combinations of transformations and apply the enlargement transformation.

Year 7

Year 7 Level Description

The proficiency strands *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra, Measurement and Geometry, and Statistics and Probability*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year level:

Understanding includes describing patterns in uses of indices with whole numbers, recognising commonalities between fractions, decimals, percentages and ratios, plotting points on the Cartesian plane, identifying angles formed by a transversal crossing a pair of parallel lines, and connecting the laws and properties of numbers to algebraic terms and expressions

Fluency includes calculating accurately with integers, representing fractions and decimals in various ways, investigating best buys, evaluating measures of central tendency and calculating areas of shapes and volumes of prisms

Problem Solving includes formulating and solving authentic problems using numbers and measurements, creating transformations and identifying symmetry, calculating angles and interpreting sets of data collected through chance experiments

Reasoning includes applying the number laws to calculations, applying known geometric facts to draw conclusions about shapes, applying an understanding of ratio and interpreting data displays

Year 7 Achievement Standard

By the end of Year 7, students interpret integers in real world contexts. They make connections between whole numbers and index notation. They move flexibly between representations of fractions, decimals and percentages. Students generalise using variables, solve simple linear equations and identify points on the Cartesian plane. They compare costs of items to make financial decisions. Students investigate questions involving the collection of a range of data. They calculate mean, mode, median and range for sets of data and describe the relationship between median and mode in data displays. Students classify triangles and quadrilaterals and establish the formulas for the area and perimeter of rectangles. They calculate the volume of rectangular prisms and draw and build three dimensional objects. They identify angles formed by a transversal through parallel lines and describe transformations on the Cartesian plane

13. Scope and Sequence - Mathematics

Strand: NUMBER	Foundation	Year 1	Year 2
Substrand: ***Number and Place Value***	Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point. GC: L, N	Develop confidence with number sequences to and from 100 by ones from any starting point. GC: L, N	Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences GC: L, N
		Skip count by twos, fives and tens starting from zero	
	Compare, order and make correspondences between collections, initially to 20, and explain reasoning GC: L, N	Count collections to 100 by separating numbers using place value GC: L, N	Group, separate and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting GC: L, N, CCT
	-	-	Recognise and represent division as grouping into equal sets and solve simple problems using these representations GC: N, CCT
	Connect number names, numerals and quantities, including zero, initially up to 10 and then beyond	Recognise, model, read, write and order numbers to at least 100. Locate these numbers on a number line GC: L, N	Recognise, model, represent and order numbers to at least 1000 GC: L, N
	Subitise small collections of objects GC; L,N	-	Explore the connection between addition and subtraction GC: N, CCT
	Represent practical situations to model addition and sharing GC;CCT	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, separating and rearranging parts GC: L, N, CCT	Solve simple addition and subtraction problems using a range of efficient mental and written strategies GC: L, N, CCT
	-	-	Recognise and represent multiplication as repeated addition, groups and arrays GC: L, CCT

Strand: NUMBER	Year 3	Year 4	Year 5
Substrand: ***Number and Place Value***	Investigate the conditions required for a number to be odd or even and identify odd and even numbers GC: L, N, CCT	Investigate and use the properties of odd and even numbers GC: L, N, CCT	Identify and describe factors and multiples of whole numbers and use them to solve problems GC: L, N, CCT
	Apply place value to separate, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems GC: L, N, CCT	Apply place value to separate, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems GC: L, N, CCT	Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies GC: L, N, ICT, CCT
	Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies GC: L, N, ICT, CCT	Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder GC: L, N, CCT	Use efficient mental and written strategies and apply appropriate digital technologies to solve problems
	Recognise, model, represent and order numbers to at least 10 000 GC: L, N	Recognise, represent and order numbers to at least tens of thousands GC: L, N, CCT	Use estimation and rounding to check the reasonableness of answers to calculations GC: L, N, CCT
	Recognise and explain the connection between addition and subtraction GC: L, N, CCT	-	-
	Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation GC: N, CCT	Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9 GC: L, N, CCT	-
	Recall multiplication facts of two, three, five and ten and related division facts GC: N	Recall multiplication facts up to 10 × 10 and related division facts GC: L	Solve problems involving division by a one digit number, including those that result in a remainder GC: L, N, ICT, CCT

Strand: NUMBER	**Year 6**	**Year 7**
Substrand: ***Number and Place Value***	Identify and describe properties of prime, composite, square and triangular numbers GC: L, N	Investigate index notation and represent whole numbers as products of powers of prime numbers: investigate and use square roots of square numbers GC: N, CCT
		Investigate and use square roots of perfect square numbers GC: N, CCT
	Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers GC: L, N, ICT, CCT	Apply the associative, commutative and distributive laws to aid mental and written computation GC: N, CCT
	Investigate everyday situations that use positive and negative whole numbers and zero. Locate and represent these numbers on a number line GC: L, N, CCT	Compare, order, add and subtract integers GC: N, CCT

Number cont:	Foundation	Year 1	Year 2
Substrand: ***Patterns and Algebra***	Sort and classify familiar objects and explain the basis for these classifications. Copy, continue and create patterns with objects and drawings GC: CCT	Investigate and describe number patterns and patterns with objects.	Describe patterns with numbers and identify missing elements GC: N, CCT
			Solve problems by using number sentences for addition or subtraction GC: N, CCT
Substrand: ***Fractions and Decimals***	-	Recognise part / whole relationships GC: L, N	Recognise and interpret common uses of halves, quarters and eighths of shapes and collections GC: L, N, CCT
Substrand: ***Money and Financial Mathematics***	Recognise that Australian money has notes and coins that can be exchanged for goods	Recognise, describe and order Australian coins according to their value GC: L, N	Count and order small collections of Australian coins and notes according to their value GC: L, N

Number cont:	Year3	Year 4	Year 5
Substrand: ***Patterns and Algebra***	Describe, continue, and create number patterns resulting from performing addition or subtraction GC: L, CCT	Explore and describe number patterns resulting from performing multiplication GC: L, N, CCT	Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction GC: L, N, CCT
		Solve word problems by using number sentences involving multiplication or division where there is no remainder GC: L, N, CCT	Use equivalent number sentences involving multiplication and division to find unknown quantities GC: L, N, CCT
		Use equivalent number sentences involving addition and subtraction to find unknown quantities GC: L, N, CCT	
Substrand: ***Fractions and Decimals***	Model and represent unit fractions including 1/2, 1/4, 1/3, 1/5 and their multiples to a complete whole GC: N, CCT	Investigate equivalent fractions used in contexts GC: L, N	Compare and order common unit fractions and locate and represent them on a number line GC: N, CCT
		Count by quarters halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line GC: L, N	Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator GC: N, CCT
		Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation GC: L, N, CCT	Recognise that the number system can be extended beyond hundredths GC: N
			Compare, order and represent decimals GC: N
Substrand: ***Money and Financial Mathematics***	Represent money values in multiple ways and count the change required for simple transactions to the nearest five cents GC: L, N	Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies GC: L, N, ICT,CCT	Create simple financial plans GC: N, CCT

Number cont:	Year 6	Year 7
Substrand: ***Patterns and Algebra***	Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence GC: L, N, CCT	Create algebraic expressions and evaluate them by substituting a given value for each variable GC: N, CCT
	Explore the use of brackets and order of operations to write number sentences GC: N, CCT	Introduce the concept of variables as a way of representing numbers using letters GC: N, CCT
		Extend and apply the laws and properties of arithmetic to algebraic terms and expressions GC: N, CCT
Substrand: **Linear and non linear relationships**		Given coordinates, plot points Cartesian plane, and find coordinates for a given point GC: N, CCT
Substrand: ***Fractions and Decimals***		
	Solve problems involving addition and subtraction of fractions, including those with unrelated denominators GC: L, N, CCT	Solve problems involving the use of percentages, including percentage increases and decreases, rates and ratios with and without digital technologies. GC: N, CCT
		Multiply and divide fractions and decimals using efficient written strategies and digital technologies GC: N, CCT
	-Compare fractions with related denominators and locate and represent them on a number line GC: N, CCT	Compare fractions using equivalence. Locate and represent fractions and mixed numerals on a number line GC: N, CCT
	Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers GC: L, ICT, CCT	Express one quantity as a fraction of another, with and without the use of digital technologies GC: N, ICT, CCT
		Round decimals to a specified number of decimal places GC: N
	Make connections between equivalent fractions, decimals and percentages GC: N, CCT	Connect fractions, decimals and percentages and carry out simple conversions GC: N, CCT
	Multiply decimals by whole numbers and perform divisions that result in terminating decimals, with and without	Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies GC: N, ICT, CCT

	digital technologies GC: N, ICT, CCT	
	Multiply and divide decimals by powers of 10 GC: N	Recognize and solve problems involving simple ratios GC: L, N, CCT
Substrand: **<u>Money and financial mathematics</u>**	Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies GC: L, N, ICT, CCT	Investigate and calculate best buys with and without digital technologies GC: L, N, ICT, CCT, EB

Strand: Measurement and Geometry	Foundation	Year 1	Year 2
Substrand: ***Using units of measurement***	Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language GC: L, N	Measure and compare the lengths of pairs of objects using uniform informal units GC: L, N	Compare and order several shapes and objects based on length and area, using appropriate uniform informal units GC: L, N
		Measure and compare the capacities of pairs of objects using uniform informal units	Compare and order several shapes and objects based on volume and capacity using appropriate uniform informal units
	Compare and order the duration of events using the everyday language of time GC: L, CCT	Tell time to the half-hour GC: L, N	Tell time to the quarter-hour, using the language of 'past' and 'to' GC: L, CCT
	Connect days of the week to familiar events and actions GC: L	Describe duration using months, weeks, days and hours GC: L, N	Use a calendar to identify the date and determine the number of days in each month GC: L, N
			Compare masses of objects using balance scales GC: L, CCT
			Name and order months and seasons GC: L, N
Substrand: ***Shape***	Sort, describe and name familiar two dimensional shapes and three-dimensional objects in the environment GC: L	Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features GC: L, N, CCT	Describe the features of three-dimensional objects GC: L
			Describe and draw two-dimensional shapes, with and without digital technologies GC: L, ICT
Substrand: ***Location and Transformation***	Describe position and movement GC: L	Give and follow directions to familiar locations GC: L, CCT	Interpret simple maps of familiar locations and identify the relative positions of key features GC: L, CCT
			Investigate the effect of one-step slides and flips with and without digital technologies GC: L, N, CCT
			Identify and describe half and quarter turns GC: L, CCT

Strand: Measurement and Geometry	Year3	Year 4	Year 5
Substrand: ***Using units of measurement***	Measure, order and compare objects using familiar metric units of length, mass and capacity GC: L, N, CCT	Use scaled instruments to measure and compare lengths, masses, capacities and temperatures GC: L, N	Choose appropriate units of measurement for length, area, volume, capacity and mass GC: L, N
	Tell time to the minute and investigate the relationship between units of time GC: L	Use am and pm notation and solve simple time problems GC: L, N	Compare 12- and 24-hour time systems and convert between them GC: N
		Convert between units of time GC: N	
		Compare objects using familiar metric units of area and volume	Calculate the perimeter and area of rectangles using familiar metric units GC: N, CCT
Substrand: ***Shape***	Make models of three-dimensional objects and describe key features GC: L, CCT	Compare the areas of regular and irregular shapes by informal means GC: L, N	Connect three-dimensional objects with their nets and other two-dimensional representations GC: L, N
		Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies GC: L, N, ICT, CCT	
Substrand: ***Location and Transformation***	Create and interpret simple grid maps to show position and pathways GC: L, N, CCT	Use simple scales, legends and directions to interpret information contained in basic maps GC: L, N	Use a grid reference system to describe locations. Describe routes using landmarks and directional language GC: L, N, CCT
	Identify symmetry in the environment GC: L, N, IU	Create symmetrical patterns, pictures and shapes with and without digital technologies GC: N, ICT, CCT	Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries GC: N, CCT
			Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original

Substrand: ***Geometric Reasoning***	Identify angles as measures of turn and compare angle sizes in everyday GC: L, N situations	Compare angles and classify them as equal to, greater than or less than a right angle GC: L, N	Estimate, measure and compare angles using degrees. Construct angles using a protractor

Strand: Measurement and Geometry	**Year 6**	**Year 7**
Substrand: ***Using units of measurement***	Convert between common metric units of length, mass and capacity GC: N	
	Interpret and use timetables GC: L, N	
	Solve problems involving the comparison of lengths and areas using appropriate units GC: L, N, CCT	Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving GC: N, CCT
	Connect decimal representations to the metric system GC:L, N	
	Connect volume and capacity and their units of measurement GC: N, CCT	Calculate volumes of rectangular prisms GC: N, CCT
Substrand: ***Shape***	Construct simple prisms and pyramids GC: CCT	Draw different views of prisms and solids formed from combinations of prisms GC: N, CCT
Substrand: ***Location and Transformation***	Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies GC: L, N, ICT, CCT	Describe translations, reflections in an axis, and rotations of multiples of 90° on the Cartesian plane using coordinates. Identify line and rotational symmetries GC: L, N, CCT
	Introduce the Cartesian coordinate system using all four quadrants GC: N, CCT	Classify triangles according to their side and angle properties and describe quadrilaterals GC: L, N, CCT
Substrand: ***Geometric Reasoning***	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 GC: L, N ICT, CCT	Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral GC: L, N, CCT
		Identify corresponding, alternate and co-interior angles when two parallel straight lines are crossed by a transversal GC: N ,CCT
		Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning GC: L, N, CCT

Strand: Statistics and Probability	Foundation	Year 1	Year 2
Substrand: ***Chance***	Answer simple questions about why something may happen GC: L	Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen' GC: L	Identify practical activities and everyday events that involve chance. Describe outcomes as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible' GC: L
Substrand: ***Data representation and interpretation***	Recognise a simple pictograph and identify differences on it	Choose simple questions and gather responses GC: L	Identify a question of interest based on one categorical variable. Gather data relevant to the question GC: L, CCT
		Represent data with objects and drawings where one object or drawing represents one data value. Describe the displays GC: L, CCT	Collect, check and classify data GC: L, N, CCT
			Create displays of data using lists, table and picture graphs and interpret them GC: L, N, CCT

Strand: Statistics and Probability	Year 3	Year 4	Year 5
Substrand: ***Chance***	Conduct chance experiments, identify and describe possible outcomes and recognise variation in results GC: L, N	Describe possible everyday events and order their chances of occurring GC: L, N	List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions GC: L, N, CCT
		Identify events where the chance of one will not be affected by the occurrence of the other GC: L, N, CCT	Recognise that probabilities range from 0 to 1 GC: L, N
		Identify everyday events where one cannot happen if the other happens GC: L, N	
Substrand: ***Data representation and interpretation***	Identify questions or issues for categorical variables. Identify data sources and plan methods of data collection and recording GC: L, N, CCT	Select and trial methods for data collection, including survey questions and recording sheets GC: L, N, CCT	Pose questions and collect categorical or numerical data by observation or survey GC: L, N
	Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies GC: L, N, ICT, CCT	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 GC: L, N, ICT, CCT	Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies GC: L, N, ICT, CCT
	Interpret and compare data displays GC: L, N, CCT	Evaluate the effectiveness of different displays in illustrating data features including variability GC: L, CCT	Describe and interpret different data sets in context GC: L, N, CCT

Strand: Statistics and Probability	Year 6	Year 7
Substrand: ***Chance***	Describe probabilities using fractions, decimals and percentages GC: L, N	Construct sample spaces for single-step experiments with equally likely outcomes GC: L, N, CCT
	Compare observed frequencies across experiments with expected frequencies GC: N, CCT	Assign probabilities to the outcomes of events and determine probabilities for events GC: N, CCT
	Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies GC: N, ICT, CCT	
Substrand: ***Data representation and interpretation***	Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables GC: L, N, CCT	Identify and investigate issues involving continuous or large count data collected from primary and secondary sources GC: L, N, CCT
	Interpret secondary data presented in digital media and elsewhere GC: L, N, CCT	Construct and compare a range of data displays including stem-and-leaf plots and dot plots GC: L, N, CCT
		Calculate, describe and display mean, median, mode and range for sets of data. GC: L,N, CCT
		Describe and interpret data displays and the relationship between the median and mean GC: L, N, CCT

1. What is our purpose?

To inquire into the following:

- **Transdisciplinary Theme**

- **Central Idea**

Summative assessment task(s):

What are the possible ways of assessing students' understanding of the central idea? What evidence, including student-initiated actions, will we look for?

Class/grade: **Age group:**

School: Angaston Good Shepherd **School code:**

Title:

Teacher(s):

Date:

Proposed duration number of hours:

Over number of weeks:

2. What do we want to learn?

What are the key concepts (form, function, causation, change, connection, perspective, responsibility, reflection) to be emphasized within this inquiry?

What lines of inquiry will define the scope of the inquiry into the central idea?

-
-

What teacher questions/provocations will drive these inquiries?

3. How might we know what we have learned?

This column should be used in conjunction with "How best might we learn?"

What are the possible ways of assessing students' prior knowledge and skills? What evidence will we look for?

What are the possible ways of assessing student learning in the context of the lines of inquiry? What evidence will we look for?

4. How best might we learn?

What are the learning experiences suggested by the teacher and/or students to encourage the students to engage with the inquiries and address the driving questions?

What opportunities will occur for transdisciplinary skills development and for the development of the attributes of the learner profile?

5. What resources need to be gathered?

What people, places, audio-visual materials, related literature, music, art, computer software, etc, will be available?

How will the classroom environment, local environment, and/or the community be used to facilitate the inquiry?

6. To what extent did we achieve our purpose?

Assess the outcome of the inquiry by providing evidence of students' understanding of the central idea. The reflections of all teachers involved in the planning and teaching of the inquiry should be included.

How you could improve on the assessment task(s) so that you would have a more accurate picture of each student's understanding of the central idea.

What was the evidence that connections were made between the central idea and the transdisciplinary theme?

7. To what extent did we include the elements of the PYP?

What were the learning experiences that enabled students to:

- **develop an understanding of the concepts identified in "What do we want to learn?"**
- **demonstrate the learning and application of particular transdisciplinary skills?**
- **develop particular attributes of the learner profile and/or attitudes?**

In each case, explain your selection.

8. What student-initiated inquiries arose from the learning?

Record a range of student-initiated inquiries and student questions and highlight any that were incorporated into the teaching and learning.

At this point teachers should go back to box 2 "What do we want to learn?" and highlight the teacher questions/provocations that were most effective in driving the inquiries.

What student-initiated actions arose from the learning?

Record student-initiated actions taken by individuals or groups showing their ability to reflect, to choose and to act.

9. Teacher notes

Please tick and elaborate how these general capabilities are being addressed.

Literacy (L)

Numeracy (N)

Competence in information and communication technology

(ICT)

Critical and creative thinking (CCT)

Ethical behaviour (EB)

Personal and social competence intercultural understanding (PSC)

Intercultural understanding (IU)