Preface

In the Mathematics learning area, students learn to use ideas about number, space and chance, and mathematical ways of representing patterns and relationships to describe, interpret and reason about their social and physical world.

Our mathematics program is based on the understanding and expectation that every child can become a successful mathematician. Therefore our teachers know and understand the mathematics they are teaching. They spend time carefully planning units of work to support their students. They know what outcomes they want the students to achieve, and they know what opportunities they need to provide for them to do that. The students also know what they are trying to achieve. They are aware that it is very important for them to understand the mathematics they are dealing with, and so they persevere. They use concrete materials, and record what they are doing in ways that make sense to them, and to others. They are taught to communicate what they are thinking, and ask questions. We expect them to be enthusiastic, challenged and excited. We want them to be self-assured and have a positive image of themselves as developing mathematicians. Our students are pattern seekers. They are independent self-directed, self-motivated learners.

1. Aims

The mathematics curriculum aims to develop the following:

- Understand the social and work purposes, uses and practices of mathematics and how these relate to each other and shape futures
- Understand and use mathematical language in creative and critical ways - both terminology and symbols
- Be confident users of mathematics who choose appropriate and accurate means for exploring the world and conducting their lives
- Gain pleasure from mathematics and appreciate its fascination and power
- Appreciate that mathematics is a dynamic field with roots in all cultures
- Apply their mathematics learning to other Learning Areas, to life in the wider community, to the virtual community, and in accessing further education and training.

These aims reflect the following beliefs:

Successful mathematicians will learn about exploring, analysing and modeling data to:

- generate and organise data and use it to make personal and collective plans.
- pose questions, explore patterns, determine a sample, collect and record data including related data, represent sample data in order to investigate the world around them.
- use everyday comparative language and number to describe the data they have generated in parts and as a whole and describe how the data assists them to answer their own questions.
• describe key features of data and draws conclusions from similar data from different groups. They make general predictions based on results.
• summarise, recognise bias, draw conclusions and make conjectures about data. Understand how different organisation and representations influence data interpretation.
• recognise situations whose outcomes are certain, impossible or unpredictable; states possible outcomes for particular events and uses everyday language to describe the likelihood of the outcomes occurring.
• describes situations where chance plays a role; collect, organise and represent data to identify possible outcomes; and uses comparative language to describe the likelihood of each outcome.
• analyse data to search for patterns in events where the range of outcomes is generated by situations where chance plays a role.

Successful mathematicians will learn about \textit{measurement} to:

• compare and order the measurable attributes of distance, surface, space, mass, turn/angle and time to describe the size of a wide range of familiar figures, objects and events.
• choose, estimate and use metric units to measure attributes of figures and objects; orders events or cycles of events; estimates the duration and time of events; constructs and uses measuring tools, explains that all measurement is approximate and that some tools increase precision.
• select appropriate attributes and systems to measure for a variety of purposes and reports on how measurement is used in social practice.
• choose and use a variety of strategies to measure the size of a wide variety of figures, objects and events drawn from the world around them.
• use direct measuring strategies to represent, communicate and record measurements graphically in symbols with correct units and performs simple operations on measures.
• use a range of standard tools to measure relationships between distances and other measurable attributes to calculate size.

Successful mathematicians will learn about \textit{number} to:

• use the base 10 number system and fractions to represent numbers when working with their peers, collections of objects, measurements and data.
• represent and compare rational numbers in a variety of ways, describing relationships among them.
• represents and analyse relationships amongst number concepts and uses these to make sense of, and represent the world.
• describes, represent and use a variety of counting strategies and the four number operations to estimate and quantify collections of objects, units of comparison and amounts of money.
• describe, represent and apply operations with whole numbers.
• describe, represent and analyse operations with rational numbers and relationships between them.
• uses counting strategies to answer questions about situations that involve number operations, use of a calculator, and informal and standard algorithms.
• use a variety of estimating and calculating strategies, including memorising addition and subtraction facts with whole numbers, and with money represented as decimals.
• uses a variety of estimating and calculating strategies with whole numbers, including memorising multiplication and division facts, fractions and decimals.

Successful mathematicians will learn about **pattern and algebraic reasoning** to:
• recognise and construct spatial and numerical patterns with concrete materials, continues these patterns and predicts what comes next.
• search for, represent and analyse different forms of spatial and numerical patterns, and relates these to everyday life.
• describes and generalises relationships between measurable attributes as patterns and explains the impact of varying one aspect of the relationship.
• represent and communicate spatial and numerical patterns.
• represents and communicate patterns with everyday and mathematical language, including symbols, sketches, materials, number lines and graphs.
• analyse, create and generalise numerical and spatial patterns and solves problems with such patterns.
• describe and represent situations from personal and family experiences and interaction with the environment where there is change over time.
• uses material, data and informal graphs to represent change.
• uses mathematical representations to make connections and analyse change.

Successful mathematicians will learn about **spatial sense and geometric reasoning** to:
• use key spatial features to describe and represent 2-D and 3-D shapes from personal and community activities.
• compare and analyse relationships between and within 2-D and 3-D shapes and objects to represent their world.
• describe and generalise spatial relationships within and between groups of 2-D and 3-D shapes and objects and appreciates their application in a range of cultural contexts.
• use simple transformations to orientate and move familiar objects and themselves when they are constructing, arranging and locating.
• predict, describe and represent the result of using combinations of reflections (flips), translations (slides) and rotations when arranging shapes, searching for patterns and describing pathways.
• analyse the result of a series of flips, slides, rotations and reflections and translations and uses scales to undertake enlargements and reductions of figures and objects.
• use everyday and positional language and makes informal maps to represent their location and familiar places.
• use positional language and measurements to formally map location and arrangements.
• produce, use and critique scaled maps and plans and envisages alternative possibilities.

2. Principles for Effective Teaching of Mathematics

The understandings, capabilities and dispositions encompassed in the essential learnings may be achieved by learners through:

• using constructivist approaches to learning
• practising the relevant skills within supportive and enabling learning environments
• active involvement in their learning
• applying their learning to new and different contexts
• processes that are learner-centred
  - are developed in authentic contexts
  - are built on over time
  - identify evidence of learning over time.

3. Content

Mathematics is divided into five strands, each of which comprises a number of Key Ideas with their respective scope. Each strand has the essential learnings woven through it, presents its own characteristic concepts and skills, and provides insights to the crucial relationships between these concepts and skills and those from the other four strands. Developing children’s confidence and ability to work mathematically is an important aspect of learning mathematics. Each strand describes ways children can work mathematically by developing their appreciation for mathematics; their understanding of the cultural and social contexts of mathematics; and their ability to choose and use mathematics in their personal, collective and community activities. The five strands are:

• exploring, analysing and modelling data
• measurement
• number
• pattern and algebraic reasoning
• spatial sense and geometric reasoning.
The Lutheran Curriculum Framework has been developed for use in all Lutheran Schools to support teachers in their planning and programming. The Mathematics Scope and Sequence is used to allow for a consistent approach across every year level.

4. Assessment

Assessment in Mathematics has a number of purposes. These include providing information to:
  - students about their progress and achievements
  - teachers to inform planning and programming
  - parents and caregivers about their children’s learning

Judgments’ about the student’s achievements will be based on clear and explicit criteria.

Assessments draw on a comprehensive range of strategies including anecdotal records based on observations, work samples, portfolios, self assessment tasks, checklists, teacher made lists, standardized tests, audio tapes, video tapes and interviews.

Students are encouraged to monitor and reflect on their progress.

Student development will be mapped across year levels.

5. Teacher’s Professional Development

Teachers keep themselves well informed both with content knowledge and teaching strategies and practices. This is achieved through:
  - professional reading
  - sharing of best practice e.g. at Staff meetings and hub groups
  - Attendance at advertised conferences, workshops, seminars, etc
  - Related and relevant association memberships.

6. Timetable

It is expected the time allocation for Math will be a minimum of 5 hours per week. Where possible, teachers need to explore opportunities for integration with other curriculum areas.
7. Resources
Effective resourcing relies on:

- an annual meeting of the Principal, the Math Key Teacher and Business Manager to review spending of the current year’s budget and to determine proposed budget for the next year.
- the administration of adequate budgetary commitments for the provision of teacher and student equipment, materials including library resources and software programs, access to the internet and related technology
- a key teacher accepting responsibility for coordinating the selection and purchase of equipment and materials to support the program
- adequate budgetary commitment to ongoing professional development for teachers.

8. 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 SACSA and LEA website.

9. Scope and Sequence - Mathematics
The Lutheran Curriculum Framework has been developed for use in all Lutheran Schools to support teachers in their planning and programming. The Mathematics Scope and Sequence is used by Good Shepherd to allow for a consistent approach across every year level.

Attached is the Lutheran Curriculum Framework Mathematics Scope and Sequence.