

Rosary School

Agreed Practice For Mathematics and Numeracy

At Rosary School our vision is for students to receive high quality teaching of contemporary pedagogy which promotes excellence and equity to be numerate and independent life-long learners. Students will develop a positive mindset towards Mathematics and Numeracy, and the ability to apply mathematical skills and effective communicators of numeracy in their daily lives.

What it Means to be Numerate

Numeracy is fundamental to a student's ability to learn at school and to engage productively in society. In the Australian Curriculum, students become numerate as they develop the knowledge and skills to use mathematics confidently across learning areas at school and in their lives more broadly.

(ACARA 2022 – General Capabilities, Numeracy, Version 9.0)

Rationale

At Rosary School, our shared vision of common beliefs and understandings in high-quality numeracy teaching and learning using evidence-based research.

We believe ...

- All students can achieve high standards given the right time and the right support
- All teachers can teach to high standards given time and the right assistance
- High expectations and early ongoing intervention are essential
- We have a shared responsibility for all students at our school.

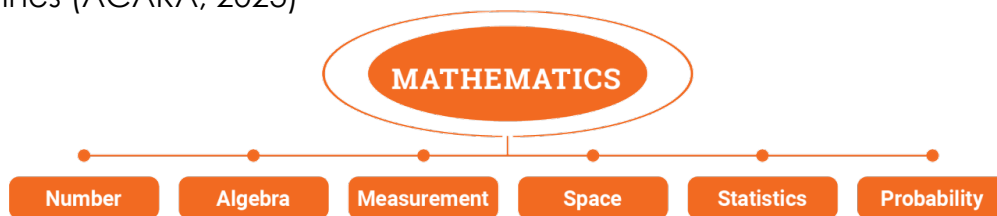
Throughout each term, we will measure and record student assessment data and provide diverse opportunities for every child to access the mathematics curriculum and achieve success at their learning level. This is achieved through anecdotal records, formative and summative assessments using the CESA Performance Standards and Assessment Design Task process, photographic evidence on Seesaw and teacher conferencing. It is expected that this work will be shared with parents, teachers and peers in formal and informal ways. Student progress will be reported to parents formally, twice a year, in the Semester 1 and Semester 2 reports.

We are committed to actioning the following agreements about the teaching and learning of Mathematics and Numeracy in 2023 and beyond. We will be guided by Catholic Education of South Australia's Literacy and Numeracy Strategy. This will be reviewed in Term 4, 2023.

The Australian Curriculum (Version 9)

Mathematics aims to ensure that students...

- Become confident, proficient and effective users and communicators of mathematics, who can investigate, represent and interpret situations in their personal and work lives, think critically, and make choices as active, engaged, numerate citizens
- Develop proficiency with mathematical concepts, skills, procedures and processes, and use them to demonstrate mastery in mathematics as they pose and solve problems, and reason with number, algebra, measurement, space, statistics and probability
- Make connections between areas of mathematics and apply mathematics to model situations in various fields and disciplines
- Foster a positive disposition towards mathematics, recognising it as an accessible and useful discipline to study
- Are able to identify their progressions of learning with teacher support, using the Numeracy Continuum (Numeracy General Capability).
- Acquire specialist mathematical knowledge and skills that underpin numeracy development and lead to further study in mathematics and other disciplines (ACARA, 2023)



Effective Teaching and Learning

At Rosary School, we agree that it is essential to present a coherent whole school approach to teaching and improvement in Numeracy, guided and informed by quality learning design, assessment, and moderation. As such, we are responsible for explicitly developing numeracy understandings, knowledge, and skills.

Therefore, we will:

- Align our school practices with Australian Curriculum Version 9 and implement learning through Mathematical blocks
- Plan effectively to incorporate the **6** content strands of *Number, Algebra, Measurement, Space, Statistics* and *Probability*
- Incorporate the Proficiency Strands of *Fluency, Understanding, Reasoning and Problem Solving*, which are now embedded into the curriculum.
- Foster the belief that every student can achieve
- Provide opportunities which encourage investigation and questioning, over routine procedures
- Demonstrate and model positive behaviours regarding mathematics, through our words and actions
- Foster self-efficacy and belief to be mathematically capable

- Foster powerful learning and growth mindsets
 - Apply numeracy concepts to interests and passions
 - Nurture a positive culture of mathematics in classrooms
 - Provides purposeful and descriptive feedback in a timely manner
 - Encourage the sharing of mathematical ideas and strategies
 - Ensure that Learning Intentions and Co-constructed Success Criteria are visible in every classroom
 - Refer to the Numeracy Continuum to plan and determine each student's individual capabilities and development in Mathematics
- <https://acleadersresource.sa.edu.au/wp-content/uploads/2018/05/numeracy-continuum.pdf>

Agreed High Impact Numeracy Instruction at Rosary School

We agree that numeracy needs to incorporate components of the following:

- Ochre Daily Reviews
- Investigations
- Interactive Read-Alouds
- Revision of previous mathematical concepts to build upon (IXL Online)
- Interactive games
- Problem Solving
- Reflections
- Opportunities to apply mathematics skills in varied and meaningful context (Exit tickets, Photo evidence with written or oral justification, Assessment Task Design, Cross-curricular links)

Structure of a Numeracy Block

1. Warm Up
2. Whole Class Explicit Teaching / Application / Transfer
3. Reflection

Warm-up: 5-10 minutes

The warm-up is a short and engaging routine or activity to activate students' prior knowledge, identify misconceptions and begin students thinking about previously learnt or taught concepts.

- Tuning in activity focusing on an essential mathematical skill {Base Ten, Calculating strategies, Basic Number skills, Estimation, Provocation etc.}
- Ochre Daily Review slides
- Students engage with IXL Online to offer student agency in upskilling mathematical concepts
- Whole class discussion to develop effective mental strategies and mathematical language.

Whole Class Explicit Teaching: 30-40 minutes

Learning Intentions & Success Criteria:

This is an integral part of teaching and learning and worked through with students to ensure they know what they are learning, why they are learning it, and how they can be successful.

Explicit:

This pedagogy provides students with opportunities to make connections within and between mathematical concepts. It is an intentional approach to teaching that considers both instructional design and delivery (The Mathematics Hub, 2023).

- Students identify the 'Mathematical Drawer' which connects the classroom display
- Explicit teaching of the skills and strategies required to further develop the understanding of a concept using Ochre Education
- Investigate the mathematical concept, continuing to build on mathematical vocabulary
- Co-construct the success criteria using an 'I can' statement, then students repeat the 'I can' statement to the teacher.

Application:

This time allows students to practice skills that have been learnt during explicit teaching time. Application tasks provide opportunities for students to engage in thinking, to problem solve, to discuss and share strategies with others and to collaborate. This allows students to explore concepts independently or collaboratively, to be challenged, to ask questions, and to engage in deep thinking. It provided opportunity for the teacher to observe, to question, to support and challenge students at different levels of learning.

Transfer:

Providing opportunities to transfer knowledge and skills they have learnt to new contexts allows them to show the application of these skills and knowledge and how they are relevant in the real world.

- Offer opportunities for students to apply and transfer mathematical concepts and further develop thinking skills
- Hands on learning which connects to wider world context
- Integration of subject areas to show transfer of knowledge (Eg STEM)
- Assessment Task Design (Summative Assessment)

Check In:

Students are invited to share their challenges, questions, accomplishments, and failures related to their learning. Regular check-ins can be done at any point throughout the mathematics lesson.

Reflection: 5-10 minutes

During the reflection phase, teachers are looking to build upon learning by making connections between what students have done in the lesson and sequence learning and strategies. This is conducted through student talk which is facilitated by the teacher to promote rich mathematical conversations.

This is also an opportunity to gather data about student misconceptions that can be used to determine the content of the following lessons.

- Students reflect on the mathematical concept using the 'I can' statement from the co-constructed success criteria, with teacher guidance if required
- Use examples on the Bump It Up Wall to guide reflection discussion
- Share processes and understanding with justifications, and make connections with different strategies that students have demonstrated
Note: This can take place during the lesson instead → 'teachable moment'
- Make mathematical connections between different ideas
- Make anecdotal notes of any misconceptions, as they should guide future instruction
- Name mathematical language and strategies evidenced by students within the lesson

*Small Group Learning Opportunities for Enrichment

- Teacher or ESO works explicitly with a small group of identified students, in response to student data, to consolidate a specific skill or concept
- This occurs when the remaining class is working on their differentiated learning experiences.

*Differentiated Learning

- Students can work in pairs, small groups or individually, focusing on a specific skill or concept
- Learning dialogue and mathematical language through pair or small group work is strongly encouraged within learning tasks
- Teachers pose open ended questions that encourage students to explore and discuss strategies they use to solve a problem
- Teachers offer verbal and/or digital multi-modal strategies.

Weekly Timetable Example of Numeracy Blocks - Single and Double Lessons

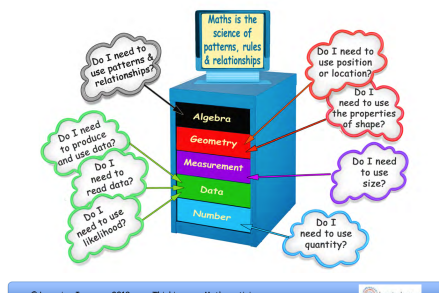
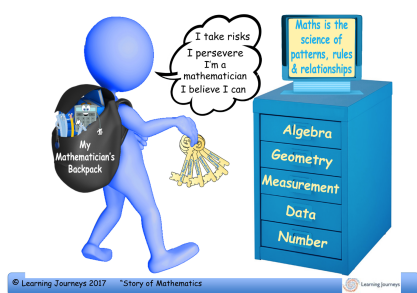
Single Lesson					
Reception – Year 6 Numeracy Block					
Time Allocation	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
10 – 15 min	Warm Up / Daily Review	Warm Up / Daily Review	Warm Up / Daily Review	Warm Up / Daily Review	Warm Up / Daily Review
25 – 35 min	Explicit Formative Assessment Demonstration of concepts	Application Practice and demonstrate new knowledge	Explicit / Application Demonstration of concepts Misconceptions Practice and demonstrate new knowledge	Transfer Investigations to apply skills to varied contexts	Explicit Review Misconceptions Formative / Summative Assessment
10 – 15 min	Reflection Student and/or Teacher Misconceptions	Reflection Student and/or Teacher Misconceptions	Reflection Student and/or Teacher Misconceptions	Reflection Student and/or Teacher Misconceptions	Reflection Student and/or Teacher Misconceptions

Double Lesson					
Reception – Year 6 Numeracy Block					
Time Allocation	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
10 – 15 min	Warm Up / Daily Review	Warm Up / Daily Review	Warm Up / Daily Review	Warm Up / Daily Review	Warm Up / Daily Review
25 – 35 min	Explicit Formative Assessment Demonstration of concepts	Explicit Recap of previous lesson Demonstration of concepts Misconceptions	Explicit Review concepts Misconceptions	Application Practice and demonstrate new knowledge	Transfer Investigations to apply skills to varied contexts
5 – 10 min	Check In	Check In	Check In	Check In	Check In
25 – 35 min	Application Practice and demonstrate new knowledge	Transfer Investigations to apply skills to varied contexts	Application Practice and demonstrate new knowledge	Transfer Investigations to apply skills to varied contexts	Explicit Review concepts Misconceptions Formative / Summative Assessment
10 – 15 min	Reflection Student and/or Teacher Misconceptions	Reflection Student and/or Teacher Misconceptions	Reflection Student and/or Teacher Misconceptions	Reflection Student and/or Teacher Misconceptions	Reflection Student and/or Teacher Misconceptions

(CESA, Numeracy Resources, Numeracy Block)

Our Commitments

- ◆ Teachers will implement Numeracy Blocks into the daily timetable.
- ◆ The Story of Mathematics picture book is read at the beginning of each year during Flying Start Week (Picture book link: [The Story of Mathematics Picture Book.pdf](#))
- ◆ The Story of Mathematics can be referred to at the beginning of a term, if required
- ◆ The following posters are displayed and referred to in each classroom to support the consistency of language in Mathematics; 'Story of Mathematics Poster 1', 'Thinking As A Mathematician' and 'Thinking My Way Through a Situation' (SharePoint link: [Classroom Display Posters](#))
- ◆ Teachers will support students to work towards developing greater fluency in Mathematics. All students will engage in IXL Mathematics online to develop greater fluency and number sense
- ◆ Teachers



will support students to engage in Numerical Acumen Challenges to further develop mathematical fluency and accuracy in basic number skills in Years 3-6

- ◆ The Learning Intention and Co-Constructed Success Criteria are evident in each lesson of Mathematics and displayed visibly in the classroom
- ◆ As a whole school, we will continue to implement and use consistent mathematical language (refer to Appendix B)
- ◆ As a whole school, we commit to assess using the Assessment Design Task process for summative assessments, incorporating the Performance Standards.
- ◆ As a whole school, we will trial the implementation of Daily Reviews from Ochre Education and reflect on its effectiveness and impact on student learning at the end of 2024.

Data Collection and Monitoring Student Progress

Student progress is monitored by collecting and analysing a range of data through different processes. Data will be used to inform the effectiveness of classroom practice and the monitoring of student growth.

We will ...

- ◆ Collect and analyse student assessment data (Assessment FOR and AS) to inform teaching and learning goals and whole school practices
- ◆ Evidence Collection– formative assessment, rubrics, anecdotal data, observations, Seesaw, photographs and checklists
- ◆ Student-led Conversations in Terms 1 and 3
- ◆ Commit to moderation on a regular basis using work samples collected
- ◆ Provide a range of self / peer assessment strategies and processes, including student conferencing

Whole School Assessments

Standardised Assessments and DATA collection	R	1	2	3	4	5	6	Frequency
PAT Mathematics (Adaptive)			✓	✓	✓	✓	✓	Term 4, Weeks 3-4
FYOSNA: Reception Early Years PAT M	✓							Term 1, Weeks 4-6 and Term 3, Weeks 8-10
FYOSNA: Year 1 Early Years PAT M		✓						Term 2, Weeks 8-10 and Term 4, Weeks 3-4
FYOSNA: Year 1 Number Check		✓						Term 2, Weeks 8-10
NAPLAN - Numeracy				✓		✓		Term 1

NB: All new students from Year 2 onwards, will complete the PAT-M assessment in their beginning weeks of school

School Assessments	R	1	2	3	4	5	6	Frequency
One-Minute Basic Number Operations Math Test (all operations) from Peter Westwood Online link: One Minute Basic Facts Test Instructions for Administration-p68k9z.pdf				✓	✓	✓	✓	Week 2, termly
One-Minute Basic Number Operations Math Test (Addition and Subtraction ONLY) from Peter Westwood Online link: One Minute Basic Facts Test Instructions for Administration-p68k9z.pdf		✓	✓					Week 2, termly
R-2 IXL Diagnostic Assessment	✓	✓	✓					Week 9-10, termly
Year 3-6 IXL Diagnostic Assessment				✓	✓	✓	✓	Week 2 and Week 8, termly

Whole School Agreed Programs and Resources

Programs and Resources	R	1	2	3	4	5	6
CESA Performance Standards (A-E)		✓	✓	✓	✓	✓	✓
OCHRE Education Resource	✓	✓	✓	✓	✓	✓	✓
IXL Online	✓	✓	✓	✓	✓	✓	✓
Numerical Acumen				✓	✓	✓	✓
PAT Resource Centre		✓	✓	✓	✓	✓	✓
Learning Through Doing Resource	✓	✓	✓	✓	✓	✓	✓

Reference Documents:

- *Literacy and Numeracy Strategy*, April 2023, CESA
- *Clarity*, 2019, Lyn Sharratt
- ACARA, 2023
- *Ochre Education*

Appendix A: Rosary School's Commitment

AREA FOR ACTION	COMMITMENT	RESOURCES
<p><i>Learners will have access to consistent understanding about what Mathematics is.</i></p> <p><i>Learners will have the opportunity to become fluent with the key thinking questions for Numeracy</i></p> <p>What mathematics would help here?</p> <ul style="list-style-type: none"> - What part (drawers/ thinking keys) of mathematics would help here? - What are the 'Thinking Questions' I need to consider? 	<p>All educators will engage learners in the Story of Mathematics/Thinking keys during the New Beginnings Program and continue this throughout the year</p>	<p>1. PMA Connecting with your learners as mathematicians (2022 Resource Pack on Website) PMA LOGIN: PMA resources can be found on the website link: https://www.primarymathematicsssa.com/pma-resources-r6 Password: Mem23MathsSAPm</p> <p>2. Flying Start Week Resources: Flying Start Resources</p> <ul style="list-style-type: none"> - Story of Mathematics - Thinking as a Mathematician - Thinking My Way Through a Situation <p>3. Picture Books - Library</p>
<p><i>Staff will be committed to preparing our students for NAPLAN from Term One</i></p>	<p>Educators will spend 5 minutes three times a week exploring the strategies for 'choosing and using' (NAPLAN)</p>	<p>PMA 8 Strategies for becoming powerful choosers and users of Mathematics: NAPLAN Support Choosing and Using Strategies Poster.pdf</p>
<p><i>Learners will have the opportunity to engage with staff who consistently model the use of accurate conceptual language.</i></p>	<p>All educators to use accurate conceptual language and to support each other to be consistent</p>	<p>LJ Poster packs ACM Glossary https://australiancurriculum.edu.au/f-10-curriculum/mathematics/glossary/#</p> <p>Dictionary Reference by Jenny Eather? http://www.amathsdictionaryforkids.com/ar/q.r.html</p>
<p><i>Learners have access to a learning program based on two key principles:</i></p> <ol style="list-style-type: none"> 1. How is this piece of the mathematics best learnt? 2. Regularity of experience is critical 	<p>All educators will use the following key questions as they design learning in Mathematics</p> <ol style="list-style-type: none"> 1. How is each aspect of your year level curriculum best learnt? (Integrated, ongoing, or as a series of lessons) 2. How will you ensure regularity of experience? <p><u>Specialist teachers are able to use the Numeracy continuum to identify which aspects would be best linked to their area of learning and share this with classroom teachers.</u></p>	<p>1. Learning Through Doing Resources Link: https://learningthroughdoing.com.au/log-in/ Teacher logins</p> <p>3. Numeracy Continuum link: Numeracy learning Continuum.pdf</p>

<p>Learners have access to a consistent and sequential learning program</p>	<p>All educators will be aware of the expectations of teaching and learning mathematics.</p> <p>All educators will monitor that children are accessing the appropriate level of learning they are entitled to.</p> <p><u>In Number, all educators use:</u></p> <ol style="list-style-type: none"> 1. Rules for Base Ten 2. Calculating Learning Sequence 3. Recalling of Facts <p><u>Problem Solving</u></p> <p><u>Patterning Resources:</u></p> <p>Learners will be introduced to the sequence of patterning at the Beginning of the Year (Reception/Year 1) and revisit this language with every year level.</p> <p><u>I Can Statements:</u></p> <p>Student self-assessment. These will be visible in in classrooms.</p>	<p>Rules for Base Ten Sequence and Resources</p> <p>Calculating Learning Sequence and Resources</p> <p>Recalling of Facts Sequence</p>
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Appendix B: Commitment to Consistent Mathematical Language - Cognitive Verbs PowerPoint

In order to empower students to develop high order thinking skills and be able to demonstrate their proficiency in Mathematics, we will use the Cognitive Verbs PowerPoint to understand the language. SharePoint Link: [Cognitive Verbs PP.pptx](#)

Appendix C: Resources

IXL

- Teachers have individual logins
- Admin login

Learning Through Doing - Teachers have individual logins

OCHRE - Teachers have individual logins