



Bletchley Park
P R I M A R Y

Mathematics Policy

Effective: May 2024

Version: 1.1

Review Date: February 2026



At Bletchley Park PS we believe effective teaching and learning of Numeracy occurs when:

- *Students* are actively engaged in hands on, purposeful activities, utilizing concrete materials where appropriate, to become effective problem solvers. They feel comfortable to take risks in their learning and to test possible solutions. Students work both independently and collaboratively to develop their knowledge of content and to demonstrate growing skill level within the proficiency strands.
- *Teachers* set clear expectations and success criteria, explicitly teach, while differentiating the learning to meet each student's individual needs. Teachers question purposefully and provide timely and explicit feedback which is linked to the learning intentions. They support students to become problem solvers and provide opportunities for every child to succeed.

Aims

Our school has adopted the aims developed by the West Australian Curriculum: Mathematics. To ensure that students:

- 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.

Planning

Teachers plan collaboratively using the WA Curriculum. Planning encompasses the three content strands to develop understanding in addition to the proficiency strands. There is a strong focus on problem solving using the UDDR method. Fluency is evident in planning, with fluency games and activities regularly included. There is evidence of the development of mathematical reasoning in all planning. Differentiation is evident in the form of modified content, process, or final product.

Timetabling

At Bletchley Park Primary School, a minimum of five hours each week is dedicated to the teaching of Mathematics. This is delivered in one hour or two-hour blocks of time (year level dependent) to accommodate problem solving and the inclusion of fluency activities as part of each lesson.

Structure of a Lesson

Teachers need to align their lesson structure to the Western Australian Curriculum and ensure lessons follow the plan, teach, assess model as outlined in the Teaching for Impact document. The HIT strategies should be reflected in the lesson structure.

Planning, teaching and assessing of all Mathematical content must encompass all four proficiency strands: Understanding, Fluency, Problem Solving and Reasoning.

Each mathematics lesson or sequence of lessons should include an explicit WALT with clear student success criteria.

CRA (Concrete, Representational, Abstract) method is used as part of the BPPS approach to teaching Numeracy.



Structuring Lessons ensures **HITS** are used throughout a lesson/unit of work.

WARM UP
Promotes **fluency** and utilises **multiple exposures**

START OF LESSON
Setting goals – emphasis on vocabulary

BODY OF LESSON – **teachers will emphasise one or more of the following**

Explicit teaching – use concrete materials to develop **understanding**
Worked examples – reduce cognitive load and support working memory
Metacognitive strategies – **problem solving & reasoning**
Collaborative learning – **problem solving & reasoning**

Whereas these will be part of every lesson

Differentiation – Content/Process/Product /Learning Environment

Questioning –Feedback

REFLECTION/END OF LESSON
Questioning - **reasoning**
Feedback – review lesson goals using vocabulary

Engage


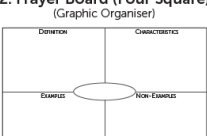


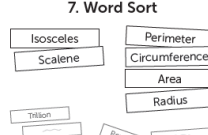
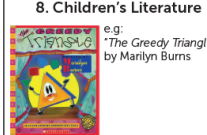
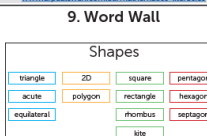

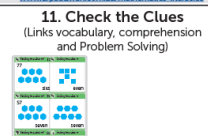
Instruct

Practise

Apply

Every lesson, select a fluency-based activity/game that allow students to practice previously taught concepts and vocabulary. Refer to the attached Mathematics Vocabulary Routines Menu for activities. More fluency games can also be found on *Paul Swan's* website. *See *Guide to Mental Warm Ups* .

MATHEMATICS VOCABULARY ROUTINES MENU

<p style="text-align: center;">1. Thinkboard (Graphic Organiser)</p>  <p style="text-align: center; font-size: small;">download this organiser at: www.drpaulswan.com.au/mathematics-literacies</p>	<p style="text-align: center;">2. Frayer Board (Four Square) (Graphic Organiser)</p>  <p style="text-align: center; font-size: small;">download this organiser at: www.drpaulswan.com.au/mathematics-literacies</p>	<p style="text-align: center;">3. Barrier Games (Oral Language/Written Instructions)</p>  <p style="text-align: center; font-size: small;">download 2 pages on Barrier Games at: www.drpaulswan.com.au/mathematics-literacies</p>	<p style="text-align: center;">4. Mystery Bag (Oral Language/Written Instructions)</p>  <p style="text-align: center; font-size: small;">download a 20 page booklet on the Mystery Bag at: www.drpaulswan.com.au/mathematics-literacies</p>																																																																	
<p style="text-align: center;">5. Knowledge Rating Scale (Formative - Summative Assessment)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>Word</th> <th>Knows the word</th> <th>Understands the word</th> <th>Thinks a good example</th> <th>Can identify what it means</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p style="text-align: center; font-size: x-small;">download a template for this at: www.drpaulswan.com.au/mathematics-literacies</p>	Word	Knows the word	Understands the word	Thinks a good example	Can identify what it means																					<p style="text-align: center;">6. Feature Analysis (Semantic)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th></th> <th>Equal Angles</th> <th>Opposite Sides</th> <th>Diagonals bisect</th> <th>Diagonals are congruent</th> </tr> </thead> <tbody> <tr><td>Isosceles</td><td>X</td><td>X</td><td>X</td><td>X</td></tr> <tr><td>Equilateral</td><td>X</td><td>X</td><td>X</td><td>X</td></tr> <tr><td>Rectangle</td><td>X</td><td>X</td><td>X</td><td>X</td></tr> <tr><td>Square</td><td>X</td><td>X</td><td>X</td><td>X</td></tr> <tr><td>Rhombus</td><td>X</td><td>X</td><td> </td><td> </td></tr> <tr><td>Parallelogram</td><td> </td><td>X</td><td>X</td><td> </td></tr> <tr><td> kite</td><td> </td><td> </td><td>X</td><td> </td></tr> </tbody> </table> <p style="text-align: center; font-size: x-small;">download a template for this at: www.drpaulswan.com.au/mathematics-literacies</p>		Equal Angles	Opposite Sides	Diagonals bisect	Diagonals are congruent	Isosceles	X	X	X	X	Equilateral	X	X	X	X	Rectangle	X	X	X	X	Square	X	X	X	X	Rhombus	X	X			Parallelogram		X	X		kite			X		<p style="text-align: center;">7. Word Sort</p>  <p style="text-align: center; font-size: small;">download an example of this at: www.drpaulswan.com.au/mathematics-literacies</p>	<p style="text-align: center;">8. Children's Literature e.g.: <i>"The Greedy Triangle"</i> by Marilyn Burns</p>  <p style="text-align: center; font-size: small;">download the 6-page list of Children's Literature at: www.drpaulswan.com.au/mathematics-literacies</p>
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<p style="text-align: center;">9. Word Wall</p> <p style="text-align: center;">Shapes</p>  <p style="text-align: center; font-size: small;">www.drpaulswan.com.au/mathematics-literacies</p>	<p style="text-align: center;">10. Encourage Writing in Mathematics</p>  <ul style="list-style-type: none"> • Keep a mathematics journal (ideal for older students - provide prompts) • Design posters e.g. "Wanted Poster" for a shape <p style="text-align: center; font-size: small;">www.drpaulswan.com.au/mathematics-literacies</p>	<p style="text-align: center;">11. Check the Clues (Links vocabulary, comprehension and Problem Solving)</p>  <p style="text-align: center; font-size: small;">download Clues Number Board Set 6 Sampler at: www.drpaulswan.com.au/mathematics-literacies</p>	<p style="text-align: center;">12. Other activities (Definition or matching)</p> <p style="font-size: x-small;">State Six: (At the start of a lesson state six words that will be used during the lesson) Newspaper/Magazine Search Vocabulary Games - Prefixes / Suffixes - Root Words - Bingo - Taboo - Pictionary Dice (e.g. Lolly Bowl)</p> <p style="text-align: center; font-size: small;">a number of related downloads at: www.drpaulswan.com.au/mathematics-literacies</p>																																																																	



Hands-On Learning Experiences

Students from K-6 should be provided with a variety of learning opportunities that enable them to build on their existing experiences, strengths and mathematical understandings. Learning should be meaningful, purposeful and involve students in hands-on mathematical experiences to develop their understanding of concepts. Students need to regularly experience opportunities for both individual and collaborative learning and teachers must ensure all students are given the opportunity to achieve intended outcomes in a safe and fair environment.

Vocabulary of Mathematics

Vocabulary is explicitly introduced at the start of the lesson as part of WALT and WILF; eg some of the words you will be using are; then is referred to multiple times throughout the lesson by teachers and students. Vocabulary is developed through hands on mathematical experiences that allow students to make connections. It is an expectation that all classes have a mathematical word wall/anchor charts (appropriate to the level of the students) and is actively used as a learning tool. Where appropriate, we use mathematical literature for the start of the lesson or as a review. Featuring relevant mathematical language to support students.

A link to Paul Swan's vocabulary guide is below.

**Also see BPPS Vocab Scope & Sequence/Guide to Mathematical Vocabulary*

<https://drpaulswan.com.au/wp-content/uploads/2021/08/Guide-to-Mathematical-Vocabulary.pdf>

Fluency

All teachers **must** dedicate a minimum of 10 minutes every day to activities that practise mathematical fluency skills. Fluency is a vital opportunity for children to learn and consolidate their knowledge of key mathematical facts and practise recalling these efficiently and accurately. This is important for progress in Mathematics because knowing facts frees up a child's working memory. Fluency sessions must incorporate a range of maths areas and not just focus on the four number operations. Years 3-6 may use the New Wave Mental Maths Books as part of their fluency practice.

Número

Número is taught by all teachers in Years PP-6. It is a mathematical card game that has been designed to assist in developing understanding of numeracy concepts and build problem solving skills. It can significantly boost children's mental maths abilities and encourages tactical thinking. The skills in the game must be explicitly taught and modelled to the children. Bletchley Park Primary School incorporates this game into the teaching of mathematics and some classes pair up to practise game skills. Students in Years 4-6 will be provided the opportunity to be part of Número club and competitions. The Número App is also available for students in Years 4-6.

Guideline for the Implementation of New Wave Mental Maths Books – Years 3-6

Students in Year 3-6 will be provided with a New Wave Mental Maths Book. Teachers will need to allocate 15 minutes per day for students to complete the day's questions.

- The majority of students will work on the year level book.
- Students who received an 'E' grade in Semester 2 of the previous year will be given a lower level book (teacher judgement for other students who may require the same).
- This *does not replace a warm up*.
- Move through the weeks in line with term, even if some days are left incomplete.



Whole School Approach to 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. It is important that the students know that the question will be hard and that you want them to try. They may not get an answer but need to know their working out is important.

Prompt students with open questions such as: Is there another way you could work it out? What else could you try? What other strategies could you try? What did you notice? Why do you think that? 'What if?' questions are good for differentiating problems.

Some students will work it out quickly so a more complex problem may be needed and students who are struggling may need a simpler one.

Open ended (low floor/high ceiling) questions allow all students to access the task at their own level.

*See *Jnr Problem Solving Cards/UDDR Process*

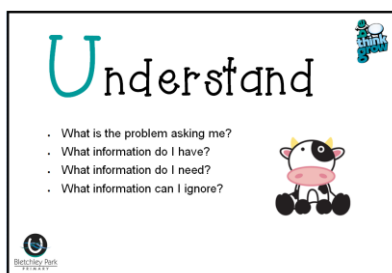
Problems must meet the following criteria:

- challenging problems for all students.
- has to be hard enough to make students think and learn something new.
- Questioning: Experiment with the wrong answer and use questioning to draw attention to what went wrong so kids change their mind.
- allow for the demonstration of maths proficiencies.
- allow students to pose questions and make conjectures

Problem Solving Process


Bletchley Park Primary School has developed a whole school approach to problem solving. This process builds the development of vocabulary and encourages students to be critical thinkers. Students are explicitly taught a range of problem-solving strategies and provided with opportunities to practise these.


Our process is displayed and taught in all classrooms 2-6. K, PP and Year One students receive exposure to this language and the concept of problem solving.

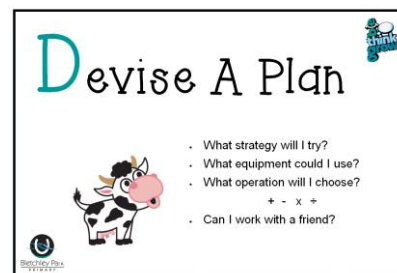


Understand

- What is the problem asking me?
- What information do I have?
- What information do I need?
- What information can I ignore?







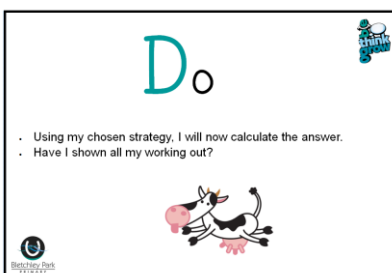


Devise A Plan

- What strategy will I try?
- What equipment could I use?
- What operation will I choose?
+ - x ÷
- Can I work with a friend?







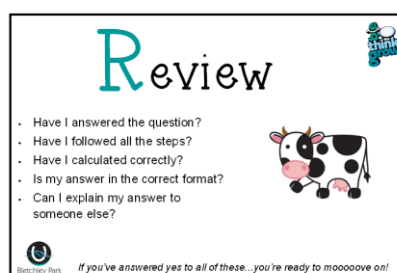


Do

- Using my chosen strategy, I will now calculate the answer.
- Have I shown all my working out?









Review

- Have I answered the question?
- Have I followed all the steps?
- Have I calculated correctly?
- Is my answer in the correct format?
- Can I explain my answer to someone else?



 If you've answered yes to all of these...you're ready to mooooove on!



Problem Solving Strategies

The following strategies are to be displayed in classrooms. If you do not have set of class posters, please see your team leader. They need to be modelled by teachers in age-appropriate language and chosen by students to solve problems. Each strategy can be used from K – 6 in varying ways. Students should be exposed to and explicitly taught these strategies in Term 1 of each school year and revisited throughout the year. Students should be able to choose which one is best suited to particular problem types. This choice of strategy is also evidence of how proficient the student is at working mathematically.

KEY	
EXPOSE	
FOCUS	
CONSOLIDATE	

Strategy	Explanation	Year levels							
		K	P	1	2	3	4	5	6
Find key information	Underline, circle or highlight key mathematical terms, numbers or other information before solving the problem.								
Guess, check, improve or estimate	Make an educated guess of what the answer may be, check to see if it works and then improve your guess. This is useful for finding missing information.								
Simplify the problem	Take out important information to make the problem simpler. Solve small parts within the problem before writing the answer.								
Draw an image	Use a diagram, picture or symbol to represent parts of the problem.								
Use equipment	Use objects, including place value blocks, shapes and beads to represent parts of the problem.								
Write an equation	Select important information and use an equation or a number sentences to solve the problem.								
Make a list	Sort the information in a problem into an organized list. This is useful for ordering numbers or making combinations.								
Make a table or chart	Organize the information from the problem into a table. This is useful for making comparisons, looking at place value or finding patterns.								
Find a pattern	Look for a pattern in the problem. This pattern could involve numbers, shapes, colours or sizes.								
Work backwards	Start from the information at the end of the problem, now work backwards to solve the problem.								



Calculation Strategies

A key component of mathematics teaching at Bletchley Park Primary School is the development of student's mental and written calculation strategies. There is a school scope and sequence for the teaching of these strategies and time is set aside for teaching and consolidation of these skills. A set of calculation posters has been developed to show how each strategy must be taught in the classroom and these must be followed by teachers to ensure strategies are taught consistently across the school. Posters are available and show the progression in teaching the skills and do not need to be displayed in the classroom but should be available for students if requested. There are many games and resources to support the implementation of this in the classroom.

Mathematics – Calculation Strategies Scope and Sequence – Aligned with Western Australian Curriculum

KEY	
EXPOSE	
FOCUS	
CONSOLIDATE	

STRATEGY IN ORDER OF IMPORTANCE	KEY VOCABULARY	K	PP	1	2	3	4	5	6
Subitising – <i>Trusting the Count</i>	Matching Digit Same								
Think big count small – <i>Adding</i>	Smaller Bigger Altogether								
Compatability – <i>Adding</i>	Number facts to 10 Sum of total								
Commutativity 'Addition' – <i>Adding</i>	More Equal to Order								
Inverse Relationships – <i>Adding/Subtracting</i>	Inverse Position								
Standard Partitioning – <i>Adding/Subtracting (trading Year 3)</i>	Partition Place Value Difference Group								
Non – Standard Partitioning – <i>Adding/Subtracting</i>	Near double Number facts								
Commutativity 'Multiplication' – <i>Multiplying</i>	Repeated addition Groups of Product Multiple of Array								
Inverse Relationships – <i>Multiplying/Dividing</i>	Inverse Position Repeated subtraction Sharing								
Standard Partitioning – <i>Multiplying/Dividing</i>	Expanded notation Partition Place Value								
Doubling or Halving – <i>Multiplying</i>	Double Half								
Halving – <i>Dividing</i>	Strategy Simplify Equivalent								
Compensating – <i>Adding/Subtracting</i>	Round to before after Multiple of 10 /100								
Non-Standard Partitioning – <i>Dividing</i>	Number facts Partition								
Factor Relationships – <i>Multiplying/Dividing</i>	Factor Divisible by Quotient								
Compensating – <i>Multiplying/Dividing</i>	Compatible numbers								



Resources

Bletchley Park Primary School supports a hands-on, student-centered approach to teaching Mathematics and is well resourced to support this. Resources are stored centrally for easy access. Number related resources can be found in the D block storeroom, while all others in the C block storeroom. Any requests for resources may be directed to your maths committee representative. The library has a collection of Mathematics story books which provide meaningful contexts for teaching and also a link to real life application. There are also teaching support materials and past NAPLAN papers kept in the library.

Assessment

All assessments must adhere to the criteria below and be in line with the BPPS Self-Assessment Framework.

1. Assess both content and proficiency strands Years P – 6, based on guidelines provided by SCSA.
2. Kindergarten will use the West Australian Kindergarten guidelines and Early Years Learning Framework.
3. Focus on **selecting strategies** and **problem solving**.
4. Be **purposeful** and **inform teaching**.
5. Have **clear criteria** that is made available to students.

Assessment schedules are used by each learning team and provide a clear and consistent method of monitoring children's progress. We encourage the use of ongoing formative assessments throughout the teaching program. Time is set aside during team meetings to moderate tasks and monitor teacher grading. In Years 1 – 6, PAT-M testing to be carried out at beginning of Term 1 and beginning of Term 4. Term 1 data to be used as a diagnostic test to inform differentiated teaching. Term 4 data to be used as a summative record of progress.

Identifying and Fixing Misconceptions

Misconceptions describe what happens when a child's conception or idea about something in mathematics is fundamentally opposed to what we are trying to teach them. The Fixing Misconceptions Books provide diagnostic testing on key number concepts to determine exactly how to intervene. These may be useful when preparing interventions for students at risk. Books are available in the following areas:

- Place Value
- Addition and Subtraction
- Multiplication and Division
- Fractions
- Decimals & Percentages

Reporting to Parents

- Two summative reports
- Parent/Teacher interviews/ Three Way Conference
- NAPLAN reports – Years 3 and 5
- Kindy Numeracy Interview
- On Entry reports – Pre-Primary & Year 1
- Case Conferences – development of Individual Education Plans for individual students and groups



Role of the Mathematics Coordinator

- Lead, manage and monitor the implementation of the Mathematics Curriculum
- Purchase and monitor resources and ensure all staff have access to materials and equipment
- Provide support to teams and individual staff members
- Provide professional learning workshops for staff as needed
- Ensure that mathematics remains a high profile in school
- Discuss regularly with the leadership team the progress of implementing the Maths Policy within the school
- Collect whole-school data and set targets for improvements
- Lead the Maths committee

Role of the Mathematics Committee

- Actively represent your year level team at meetings
- Feedback decisions/happenings/tasks set by the committee to your team in *an accurate and timely manner*
- Lead/promote the Numeracy focus in your team
- Collect data/work samples to share with the committee
- Support the implementation of our Whole School and Operational Plan (Numeracy)

