

# Port Jackson Number Sense Assessment & Programming Framework

**“a child’s fluidity and flexibility with number, the sense of what numbers mean, and an ability to perform mental mathematics and to look at the world and make comparisons”  
(Gersten & Chard, p.20)**

or another way of saying it

**flexibility in thinking about numbers (and operations) as a well-organised network of numerical knowledge that allows numbers to be used and represented in multiple ways, including relating them to each other, composing and decomposing them, or embedding them in various contexts of mathematical operations and problem solving. (Reuss, 2000)**

An initiative of Sydney Region Central North Zone Learning Assistance Program Team (2007-2008)  
In consultation with Sydney Region Mathematics consultant - Pat Leburn and Sydney University David Evans.

The Port Jackson Number Sense project is an initiative of Sydney Region Central North Zone Learning Assistance Program (LAP) Team (2007-2008). Special thanks to Denise Croft for her efforts in co-ordinating and organising/reorganising the ideas and planning into a viable document.

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**Information that you need to have read before proceeding with the assessment.**

The Assessment is a Curriculum Based Measure based on the **K-6 Mathematics Syllabus 2002**. It has been designed to assist teachers to find the appropriate starting point to begin teaching their students and identify where students may be experiencing difficulties in learning.

The program, or responding to assessment document is based on the outcomes and content from the **K-6 Mathematics Syllabus 2002**.

There are 4 sections:

- a) Number Sense Assessment
- b) Assessment data recording sheet
- c) Responding to Assessment program
- d) Daily lesson planning page

The layouts of the assessment, assessment-recording page and program have been aligned to make the process of data collection to programming a simple easily understood procedure. The assessment questions for each stage/grade have been aligned in one column. Begin at the top of the first page and continue to follow the column through the following pages. If the child you are assessing clearly demonstrates that they are unable to complete a question, slide to the left to assess if the child is able to demonstrate pre-knowledge taught in the previous stage outcome. If the student demonstrates strength in the section, you may slide to the right to the next stage/grade to check if the student has achieved that content from next stage outcome (Table 1).

Table 1

ES1	Stage 1 (Unit 1)	Stage 1 (Unit 2)	Stage 2+
	←		
	*		
	*		
		→	
	*		
	*		

The information gained from the assessment includes language, knowledge and skills used in mathematics. It may be used to compliment the SENA and other mathematics assessments or used as an independent assessment for identifying what students experiencing learning difficulties need to learn.

Questions should be repeated if necessary. It is important that students who have difficulties and disabilities have the same opportunity to demonstrate what they know.

## Assessment process

### *Materials required*

*The assessment*

*The assessment recording sheet and clipboard*

*Cardboard for screening stimulus pages*

*A pen and highlighter*

*Stimulus materials*

*Plain paper and a pencil for the student to use*

*9 blue counters and 7 yellow counters*

- Ensure the student is comfortable and seated in a position where you are able to comfortably communicate with them and observe actions without the student being able to see what you record.
- Explain to the student that they are doing the assessment to help you work out what to teach in maths.
- Write the child's name and the date on the assessment sheet.
- Ask the child the stage or grade appropriate questions from the selected column. Record the child's answers and their working out on the on the recording page. Additional information may me recorded on the reverse side of the recording pages. Note prompts as below.
- Highlight the sections not achieved for easy identification

### Standard Prompts

**Addition question:** Ask the question using the provided stimulus (numbers only). If the child is unable to answer the question, write an addition symbol between the numbers and ask the question again. Record the answer given

**Subtraction question:** Ask the question using the provided stimulus (numbers only). If the child is unable to answer the question, write a subtraction symbol between the numbers and ask the question again.

### Important Information

*If the students are unable to read the numbers on the stimulus, ask the child if they would like you read the numbers to them. It is important that students who have difficulties and disabilities have the same opportunities to demonstrate what they know. Identification of numbers or mathematics symbols is not an indication of other skills and knowledge (for example addition or subtraction).*

## ***Identifying Learning Needs and Programming for Instruction***

### ***Step 1***

#### ***Materials required***

*The assessment results*

*The assessment recording pages*

*Highlighter*

Examine the assessment recording page and highlight the sections not achieved. That is, sections that the student will need to learn.

### ***Step 2***

#### ***Materials required***

*The assessment recording pages*

*Teaching Number Sense-Responding to the Assessment pages*

*Highlighter*

- Identify areas that have been highlighted on the recording sheets.
- Highlight the corresponding sections on the Teaching Number Sense-Responding to the Assessment pages

### ***Step 3***

#### ***Materials required - 15 minute lesson***

*Teaching Number Sense-Responding to the Assessment pages*

*Vocabulary sheet*

*Supporting Number Sense lesson planning sheet*

- Consider what students will be taught in future lessons and choose a vocabulary word that will be used by the teacher
- Examine the Teaching Number Sense-Responding to the Assessment pages to determine what the students know and what they need to know (highlighted framework sections)
- Hierarchically order what the student(s) need to know (from easiest to hardest) then select a suitable starting point for the first lesson. Plan to teach in small steps, remembering to revise previous learning when introducing new learning each lesson with a ratio of 3 known to 1 unknown (3:1) to ensure success.
- Use the Supporting Number Sense lesson planning sheet to record the content, teaching examples and practice items for each lesson. The 'Modelled math fluency' and 'Games' sections can be used to develop the critical number sense areas of counting, sense of sequence, quantity and comparison, the reading of numbers and the understanding of place value. (The 'Concepts and Strategies' section is an additional 10-15 minute block that is included in the longer 30 minute lesson.)
- Create an appropriate 'journal page' that will enable students to record and demonstrate their learning.

### ***Materials required - 30 minute lesson***

*Teaching Number Sense-Responding to the Assessment pages*

*Sena results, if available*

*Vocabulary sheet*

*Number Sense 'Concepts and Strategies' Sequence sheet*

*Supporting Number Sense lesson planning sheet*

- Consider what students will be taught in future lessons and choose a vocabulary word that will be used by the teacher
- Examine the Teaching Number Sense-Responding to the Assessment pages to determine what the students know and what they need to know (highlighted framework sections)
- Examine Sena results
- Hierarchically order what the student(s) need to know (from easiest to hardest) then select a suitable starting point for the first lesson. Plan to teach in small steps, remembering to revise previous learning when introducing new learning each lesson with a ratio of 3 known to 1 unknown (3:1) to ensure success.
- Select any concepts or strategies that need to be taught, for example, number line, place value or split strategy for addition, using the Number Sense 'Concepts and Strategies' Sequence sheet as a guide.
- Use the Supporting Number Sense lesson planning sheets to record the content, teaching examples and practice items for each lesson. The 'Modelled math fluency' and 'Games' sections can be used to develop the critical number sense areas of counting, sense of sequence, quantity and comparison, the reading of numbers and the understanding of place value. The 'Concepts and Strategies' section can be used to develop any concepts or strategies as selected in the previous step.
- Create an appropriate 'journal page' for each lesson that will enable students to record and demonstrate their learning.

### ***Step 4***

- ***Provide quality teaching always***
- Using the above programming - teach directly and systematically first, then provide practice, opportunities to ask questions and give answers.
- Explain vocabulary and teach meanings
- Establish a lesson routine
- Be careful to think about, and be aware of the words you will use to explain
- Restrict words – be explicit in what you say
- Don't explain in several different ways, students with language processing disorder and those experiencing learning difficulties may think the three speech streams are three different things they have to remember.
- Use a variety of examples (materials) that will enable the students to generalise what they learn to a variety of situations
- Monitor students progress carefully
- Provide opportunities for higher order thinking
- Use metalanguage
- Provide opportunities for discussion
- Give opportunities for reporting back on what is learned