

1. Students use language to understand, develop and communicate ideas and information and interact with others.	2. Students select, integrate and apply numerical and spatial concepts and technologies.	3. Students recognise when and what information is needed, locate and obtain it from a range of sources and evaluate share and use it with others.	4. Students select, use and adapt technologies.	5. Students describe and reason with patterns, structures and relationships in order to understand, interpret, justify and make predictions.	6. Students visualise consequences, think laterally, recognise opportunity and potential and are prepared to test options.	7. Students understand and appreciate the physical, biological and technological world and have the knowledge and skills to make decisions in relation to it.	8. Students understand their cultural, geographic and historical contexts and have the knowledge, skills and values necessary for active participation in life in Australia.	9. Students interact with people and cultures other than their own and are equipped to contribute to the global community.	10. Students participate in creative activity of their own and understand and engage with the artistic, cultural, and intellectual work of others.	11. Students value and implement practices that promote personal growth and well being.	12. Students are self-motivated and confident in their approach to learning and are able to work individually and collaboratively.	13. Students recognise that everyone has the right to feel valued and be safe, and in this regard understand their rights and obligations and behave responsibly.
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Level 1	<b>N6a.1</b> Reads, writes and says small whole numbers, using them to say how many things there are, makes collections of a given size, and describes order.	<b>N7.1</b> Visualises self-generated or orally-presented number stories and partitions of small numbers, and represents them in materials, drawings, with a calculator or by role playing.	<b>N8.1</b> Uses counting and other strategies to solve mentally self-generated or orally-presented questions from stories involving small numbers.	<p align="center"><b>CONTENT</b></p> <p align="center"><b>Number: Operations</b></p> <p><i>Whole numbers, simple fractions and the four operations are used to solve problems.</i></p> <p>Understand the language and meaning, of addition, subtraction, multiplication, division.</p> <p><b>Addition and subtraction</b> Basic addition. How many things are there? Count to find a total. Take given number from set. Add and subtract 2-digit whole numbers. They can be calculated using concrete materials, mental computation and written strategies.</p> <p>Recognise the 'part-part whole' pattern to solving problems.</p> <ul style="list-style-type: none"> <li>If the whole quantity is unknown – addition is required</li> <li>If part of the quantity is unknown – subtraction is required</li> </ul> <p><b>Multiplication and division</b> Calculated with whole numbers to 10 can be calculated using arrays, skip counting, doubles, double doubles, turn-arounds and sharing of concrete materials.</p> <p>Multiplication is 'repeated addition' eg <math>4+4+4 = 3 \times 4</math> i.e. 12. Repeating equal quantities</p> <p>Division is having a quantity divided into portions. Dividing into equal portions</p> <p><b>Problem solving:</b> involving operations can be explored using concrete materials, sketches and diagrams.</p>	<p align="center"><b>Useful Websites</b></p> <p><b>Teacher Plans</b></p> <ul style="list-style-type: none"> <li><a href="#">Under The Sea</a> Integrated thematic unit of work which develops and reinforces concepts from the number and operation, geometry, measurement, and data management and analysis strands</li> <li><a href="#">Patterns Here, There &amp; Everywhere</a> Unit of work on Patterns with lessons and suggestions for integration across the curriculum</li> <li><a href="#">Here, There &amp; Everywhere</a> Students can explore, identify, describe and create repeating patterns found in everyday life using various learning centres</li> <li><a href="#">Buttons, Buttons, Buttons</a> PDF about basic pattern skills</li> <li><a href="#">Orange Slices</a> investigate the fractional part of an orange.</li> <li><a href="#">Pass The Paper Game-Skip Counting</a> strategy to practice skip counting</li> </ul> <p><b>Student Activities</b></p> <ul style="list-style-type: none"> <li><a href="#">Virtual Goose</a> Interactive game where students can practice pattern and matching skills.</li> <li><a href="#">Yahoo Kids! Numbers-and-Counting</a> Lots of sites with word, music and number games, interactives, printable colouring pages and more.</li> <li><a href="#">Colouring Even and Odd Numbers</a></li> <li>Use the Technology activity "Parts of a Whole" which is interactive for each of these: <ul style="list-style-type: none"> <li><a href="#">Divide and Shade</a></li> <li><a href="#">Equal Parts</a></li> <li><a href="#">Parts to Whole</a></li> <li><a href="#">Writing Fractions</a></li> </ul> </li> <li><a href="#">Lo Shu Magic Square Activity</a></li> <li><a href="#">Number &amp; Operations Manipulatives</a> large menu of interactive activities.</li> </ul>
	Syllabus	<p><b>Understand Operations</b> Understand number stories involving change, combine and compare situations by using materials, drawing a picture or acting out Represent change (join and separate) situations with number sentences to match the semantic structure (meaning) of the problem Visualise self-generated or orally presented number stories involving very small numbers Visualise small numbers as groupings of other numbers Visualise equal groups within a small collection</p> <p><b>Calculate</b> Strategies to mentally add and subtract small numbers generated from stories Strategies to solve addition and subtraction problems using materials and diagrams Solve multiplication and division problems using materials and diagrams Use a calculator to count</p>			
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<p align="center"><b>Knowledge</b></p> <p><b>Understanding Basic Operations</b> Understand the language and meaning, of addition, subtraction, multiplication, division.</p> <p><b>Key Understandings</b></p> <ul style="list-style-type: none"> <li>You can count objects in different ways – but the resulting number will always be the same.</li> <li>We can think of a number as a sum or difference in different ways.</li> <li>Place value helps us to calculate with any whole or decimal numbers</li> <li>There are strategies we can use to calculate number problems. Some of these we can do in our head.</li> </ul> <p>Convert number stories into number expressions Use verbal cues eg <i>how many eggs were collected?</i></p>	<p align="center"><b>Skills</b></p> <p><b>Understanding Basic Operations</b> Use language of basic operations</p> <p><b>Addition and Subtraction</b> <u>Recognise the 'part-part whole' pattern</u> to solving problems.</p> <ul style="list-style-type: none"> <li>If the whole quantity is unknown – addition is required</li> <li>If part of the quantity is unknown – subtraction is required</li> </ul> <p><b>Multiplication and Division</b> <u>Multiplication is 'repeated addition'</u> eg <math>4+4+4 = 3 \times 4</math> i.e. 12 <u>Division is having a quantity divided into portions</u> Or to decide how much is to be in each portion.</p> <ul style="list-style-type: none"> <li>Multiplication: repeating equal quantities</li> <li>Division: dividing into equal portions.</li> </ul>	<p align="center"><b>Dynamic Strategies</b></p> <p><b>Understanding Basic Operations</b> Language of four basic operations. Use the following words with understand:</p> <ul style="list-style-type: none"> <li><u>Addition</u>: how many, adding up, more of, combine, Partitioning: part – part whole,</li> <li><u>Subtraction</u>: take away, less of, compare, what is the difference. Partitioning: part – part whole</li> <li><u>Multiplication</u>: times, products, repeated addition, arrays, areas, rates, scaling,</li> <li><u>Division</u>: sharing, divide into, repeated subtraction, , grouping, conversions,</li> </ul> <p><b>Calculate the four processes</b></p> <ul style="list-style-type: none"> <li>Use the processes of addition, subtraction, multiplication, division</li> <li>Select the most appropriate method for calculation: mental, approximate calculation, exact calculation – using paper, use of technology: calculators</li> </ul> <p><b>Convert everyday stories into number expressions</b></p> <p><b>Solve problems using combinations of the four processes</b> Build connections between: real life, stories, diagrams, symbols (numbers)</p>	<p align="center"><b>Assessment</b></p> <p><b>Understanding Basic Operations</b> Listen to stories that involve a number action. In groups discuss the process that is required</p> <p><b>Addition and Subtraction</b> Recognise the 'part-part whole' pattern to solving problems.</p> <p><b>Multiplication and Division</b> Find example in the real world relating to:</p> <ul style="list-style-type: none"> <li>Multiplication: repeating equal quantities</li> <li>Division: dividing into equal portions.</li> </ul> <p><b>Convert everyday stories into number expressions.</b></p> <p><b>Solve problems</b></p>
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**Addition and Subtraction**

Students become aware that language can be used to discuss combinations of numbers e.g. 7 is 3 and 4 more.

**Key Understanding**

Adding and subtracting numbers is used to change a quantity by adding more or taking some away.

Process: See a quantity as combined parts.

This is called: partitioning numbers.

See numbers as: **part-part-whole**

This helps to understand addition and subtraction and understand their properties

Students are aware of strategies to 'add' and 'take' e.g. using counting stones, fingers, or by drawing pictures and then counting them.

**Multiplication**

**Using Multiplying**

We use multiplying numbers when we:

- repeat equal quantities
- need products of measures

Conceptualise: Multiplication as 'repeated addition' eg  $4 + 4 + 4 = 3 \times 4$  i.e. 12

**Addition and Subtraction**

**Skills Development**

- Count forwards or backwards by ones, from a given number
- Identify number before and after a given number
- Represent two digit numbers using numerals, words, objects
- Count and representing sets of objects by grouping in tens and hundreds
- Using a number line to assist with counting and ordering
- Counting forwards and backwards by twos, fives and tens
- Counting forwards and backwards by tens.

**Thinking processes**

- Identify ways numbers are used in our lives
- Interpret numbers used in books and newspapers
- Use number patterns to assist with counting.
- Use money to consolidate addition and subtraction

**Multiplication**

Using mental strategies to multiply a number by a multiple of 10

Multiplying two digit numbers by one-digit numbers

**Processes**

- Skip count by ones, twos, fives and tens.
- Represent using drawings, numerals, symbols and words

**Addition and Subtraction**

Provide concrete experience by using objects to add and take.

Pose practical problems involving add and take e.g. A hen had 7 chickens but 2 ran away. How many did the hen have left?

Provide a set of pictures, and direct the children to take away (cross out) some of the items to demonstrate subtraction facts. Match pictures to sums

Addition and subtraction games: One player has a set of answer cards with noughts marked on the face, and the other player has a set with crosses marked on them. On the reverse of all cards are numerals, some of which answer the grid questions. In turn, the players take an answer card from their stock and decide if the numeral matches a question. If so, they place the card face up over the question. The game is won by the first player to complete a line of crosses, as in noughts and crosses.

Use a number track with a partner. One child places a set of counters on the track. The partner removes some of the counters while the first child isn't looking. The first child tells a number story about the action.

Select a handful of counters from a bag that contains counters of two colours. Make number stories e.g. There are eight altogether. If you take away the red ones it leaves five.

Use shopping activities to provide meaningful addition and subtraction problems. Shop from a catalogue to find real examples.

**Multiplication**

Counting by 3's, 4's, 6's, 7's, 8's or 9's using skip counting

Listing multiples for a given number eg  $3 = 3 \ 6 \ 9$

Use place value concepts eg  $(4 \times 2 \text{ tens} = 8 \text{ tens} = 80)$

Use mental strategies to recall multiplication:

- The commutative property of multiplication eg  $5 \times 8 = 8 \times 5$
- Use patterns eg  $5 \times 5 = 25$  so  $5 \times 6 = (5 \times 5) + 5$
- The multiplication numbers for 4 are double the multiplication numbers for 2'
- Use place value concepts  $(4 \times 2 \text{ tens} = 8 \text{ tens} = 80)$

**Activities**

- Convert stories to number sentences
- Write problems as repeated addition eg  $3 \times 5 = 5 + 5 + 5$
- Counting by ones, twos, fives and tens using rhythmic or skip counting
- Describing collections of objects as 'rows of' and 'groups of'

**Addition and Subtraction**

Uses the words 'add' and 'take' to refer to basic processes in real life situations.

Interprets instructions that describe number operations.

Mental:

- Add or subtract a number less than 10 to any number.
- Add or subtract multiples of 10

Written:

- Add numbers to 100 with regrouping
- Subtract whole numbers to an answer less than 100 with regrouping of 'ones'.
- Double numbers to 50.

Relates a number story orally.

**Multiplication**

Multiply a number less than 10

Include money: either all cents or whole dollars.

**Division**

Conceptualise division as: a quantity divided into equal portions. Determine how much is to be in each portion.

**Use of division**

- share a quantity into a given number of portions
- share a quantity into portions of a given size

Identify different contexts for use of division

**Fractions**

View and describes halves and quarters, of objects and collections, occurring in everyday situations

Understands the meaning of 'half' and 'quarter', splitting quantities into 'fair' shares and partitioning quantities repeatedly into halves.

When we split something into two equal sized parts we say we have halved it and that each part is half the original thing

Recognising that fractions are like division. The number above is divided into equal parts.

- Seeing the denominator as the number of equal parts to be created.
- Seeing the numerator as the number of equal fractional parts

Placing halves, quarters on a number line between 0 and 1 to further develop equivalence

Counting by halves and quarters

Ordering fractions with halves and quarters

**Division**

Divide numbers up to 100 by numbers up to 9. Solve open number sentences.

**Processes**

- Solve simple multiplication and division problems, including those involving money
- Solve problems using objects, diagrams, imagery, actions or trial-and-error.
- Use a number line to solve multiplication and division problems.
- Use estimation to check that the answers to multiplication and division problems are reasonable
- Use patterns to assist counting by twos, fives or tens

**Fractions**

Use fractions half, quarter

Ability to express number sentence as a fraction

Using the number line to locate fractions.

**Processes**

- Examine if parts of a whole object, are equal
- Explain why the parts are equal
- Use fraction language in the time unit eg. the half-hour...
- Recognise the use of fractions in real life situations e.g. half-hour television programs

**Division**

**Division:** Do not start division until multiplication is well established.

Conceptualise division as: a quantity divided into equal portions.

Division involves determining how much is to be in each portion.

Use a sharing diagrams to represent the process

Use different methods of showing division:  $\div$   $)$   $x / y$

**Use strategies to divide by a one-digit number**

- sharing out
- use number sentences
- writing division problems as repeated subtraction eg 12 divided by 3 = 12-3-3-3

**Activities**

- Make equal groups by dealing out an equal number of things to each recipient.
- Share out objects.
- Make more portions from the same quantity – by making smaller size portions.
- Make larger portions by distributing to less people eg Would each person get more apples if you share 12 apples with two or three people? Why?

Record multiplication and division problems using drawings, numerals, symbols and words

**Fractions**

Identify fractions with denominators 2, 4, by: Creating halves, quarters of an object

Describe a half or a quarter of a whole object

Describe a half or a quarter of a collection of objects

Using fraction notation for half ( $\frac{1}{2}$ ) and quarter ( $\frac{1}{4}$ )

Record equal parts of a whole, and the relationship of the groups to the whole using pictures and fraction notation

Make different representations of halves - half the paper length ways and then sideways to show how they can look different

- Halve a collection with an even number of things by sharing / grouping and checking that the number in each half is the same.
- Find half of a quantity by splitting it into two equal portions and selecting one portion.

**Activities**

- Cut fruit into parts- half, quarters. How many parts of each group?
- Use Cuisenaire rods

**Number line:** Place halves, quarters on a number line between 0 and 1

Counting by halves and quarters

Ordering fractions with the same denominator

**Division**

Make equal groups by dealing out an equal number of things to each recipient. Share out objects.

Make more portions from the same quantity – by making smaller size portions.

**Fractions**

Using the number line to locate fractions.

Make different representations of halves and quarters

**Number line:** Place halves, quarters on a number line between 0 and 1

Counting by halves and quarters

Ordering fractions with the same denominator

**Decimals**

Understand that decimals are ways of representing parts of a whole.

**Understands Whole and Decimal Numbers.**

We can often see how many there are just by looking at them and thinking of it in parts

The number can be said and written in different ways.

Recognising equivalence: seeing tenths as 0.1 is same as  $\frac{1}{10}$

**Money**

Use money to consolidate number

- Read and write prices in dollars OR cents.
- Count coins by 5c, 10c, 20c to \$1.00.
- Count collections of \$1 and \$2 coins.
- Read prices expressed in decimals as dollars and cents.

Become aware of the language of money.

Consolidate the understanding of the value of various denominations.

Use coins to make up amounts.

Carry out practical money activities with all denominations of coins, and of notes to \$20

Read amounts of money and make up the amounts in coins e.g. make up \$7

Compare amounts of money.

Determine if the amount needed is more or less than the amount they have.

Subtraction: - calculate the difference.

**Decimals**

Use decimals in the following ways:

- Add and subtract numbers with decimals to one decimal place
- Multiply and divide decimals to one decimal place

Place decimal numbers on a number line between 0 and 1

**Money**

Use money terms appropriately.

Communicate using money units.

Identify money units.

Play shopping games requiring counting of coins. Share amounts of money using 5c, 10c, 20c, 50c, and \$1 coins; and a mixed set of 5c, 10c, 20c and 50c coins.

Recognise the value of coins.

Add different coins to make a given amount.

Calculate change needed for goods with prices to 50c. Extend to \$1.

Play games of exchange, using all coins.

**Decimals**

Understand that decimals are ways of representing parts of a whole.

Use decimals in the following ways:

- Add and subtract numbers with decimals to one decimal place
- Multiply and divide decimals to one decimal place

Placing decimal numbers on a number line between 0 and 1

Read and write talk out using decimals

Applying an understanding of place value to express whole numbers, tenths as decimals

Recognising equivalence: seeing tenths as 0.1 is same as  $\frac{1}{10}$

**Money**

- Add money to make totals of money in dollars and cents
- Recognise that there are always 2 digits after the decimal point as if there were 3, that would be the dollar
- Order smallest to largest
- Select coins from a pile of coins to pay for a priced item
- Read cash register total. Provide a large note. Calculate the change required.
- Find different ways of showing the same monetary amount

**Understanding number – money**

Various free and directed activities with all coins, which encourage:

- Handling, sorting, matching, arranging;
- Recognising, counting;
- Shopping, exchanging.

Play shopping games purchasing:

- One article.
- More than one article
- Several of one article.

Solve problems based on the school canteen price list. What is the total cost of a sandwich, an apple and an orange juice? What is the cheapest lunch you could buy at the canteen?

**Decimals**

Add and subtract numbers with decimals to one decimal places

Multiply and divide decimals to one decimal place

**Money**

Use money in realistic problem-solving situations.

Lesson Title:

Date:

Lesson	Teaching Plan	Student Activities Resources	Assessment
1 S&S			
2			
3			
4			
5			