

## Kindy to Year 2

### NUMBER & ALGEBRA

Number and Algebra are developed together, as each enriches the study of the other. Students apply number sense and strategies for counting and representing numbers. They explore the magnitude and properties of numbers. They apply a range of strategies for computation and understand the connections between operations. They recognise patterns and understand the concepts of variable and function. They build on their understanding of the number system to describe relationships and formulate generalisations. They recognise equivalence and solve equations and inequalities. They apply their number and algebra skills to conduct investigations, solve problems and communicate their reasoning

	<b>Understanding</b>	<b>Fluency</b>	<b>Problem Solving</b>	<b>Reasoning</b>
F	<i>Understanding</i> includes connecting names, numerals and quantities	<i>Fluency</i> includes readily counting numbers in sequences, continuing patterns.	<i>Problem Solving</i> includes using materials to model authentic problems, sorting objects, using familiar counting sequences to solve unfamiliar problems	<i>Reasoning</i> includes explaining comparisons of quantities, creating patterns
1	<i>Understanding</i> includes connecting names, numerals and quantities, and <b>partitioning</b> numbers in various ways	<i>Fluency</i> includes <b>counting number</b> in sequences readily forward and backwards, locating numbers on a line.	<i>Problem Solving</i> includes using materials to model authentic problems, and using familiar counting sequences to solve unfamiliar problems.	<i>Reasoning</i> includes explaining patterns that have been created
2	<i>Understanding</i> includes connecting <b>number</b> calculations with counting sequences, <b>partitioning</b> and combining numbers flexibly, identifying and describing the relationship between addition and subtraction and between <b>multiplication</b> and division	<i>Fluency</i> includes counting numbers in sequences readily.	<i>Problem Solving</i> includes formulating problems from authentic situations, making models and using <b>number</b> sentences that represent problem situations.	<i>Reasoning</i> includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations.

<b>What do I believe about number and algebra and learning how to work with number and algebraic concepts?</b>	<b>Therefore, what do I need to do in my classroom? What do the children need? What equipment could I use?</b>
<ul style="list-style-type: none"> <li>➤ One to one correspondence</li> <li>➤ Subitising</li> <li>➤ Matching quantities to number</li> <li>➤ Ordering number</li> <li>➤ Moving fluidly back and forth on a number line</li> <li>➤ Rote skip counting</li> <li>➤ Number patterns</li> <li>➤ Number bonds/establishing mental maths strategies</li> <li>➤ Operations using concrete materials</li> <li>➤ Comparison of quantities</li> <li>➤ Estimation</li> <li>➤ Rote counting</li> <li>➤ Place value (tens, units in a number)</li> <li>➤ Counting and number recognition in play and everyday situations– shops, grouping children</li> <li>➤ Number formation and identification</li> </ul>	<ul style="list-style-type: none"> <li>➤ Concrete materials – Straws, counters, pop sticks, cups, elastic bands, dice.</li> <li>➤ Number games</li> <li>➤ Number cards</li> <li>➤ Natural materials</li> <li>➤ Number lines</li> <li>➤ Calculators, technology incorporating mathematics.</li> <li>➤ Sensory materials for number formation (shaving cream, sand tray)</li> <li>➤ Playing cards/Uno.</li> </ul>

# Year 3 Level 3

## NUMBER & ALGEBRA

Number and Algebra are developed together, as each enriches the study of the other. Students apply number sense and strategies for counting and representing numbers. They explore the magnitude and properties of numbers. They apply a range of strategies for computation and understand the connections between operations. They recognise patterns and understand the concepts of variable and function. They build on their understanding of the number system to describe relationships and formulate generalisations. They recognise equivalence and solve equations and inequalities. They apply their number and algebra skills to conduct investigations, solve problems and communicate their reasoning

Understanding	Fluency	Problem Solving	Reasoning
<p><i>Understanding</i> includes connecting <b>number</b> representations with <b>number</b> sequences, <b>partitioning</b> and combining numbers flexibly, representing unit fractions.</p>	<p><i>Fluency</i> includes recalling <b>multiplication</b> facts, using familiar metric units to order and compare objects.</p>	<p><i>Problem Solving</i> includes formulating and modelling authentic situations and using <b>number</b> properties to continue <b>number</b> patterns</p>	<p><i>Reasoning</i> includes using generalising from <b>number</b> properties and results of calculations, comparing angles.</p>
<p><b>What do I believe about number and algebra and learning how to work with number and algebraic concepts?</b></p>		<p><b>Therefore, what do I need to do in my classroom? What do the children need? What equipment could I use?</b></p>	
<ul style="list-style-type: none"> <li>➤ Learning your times table is very, very important.</li> <li>➤ All Maths (number) concepts are related or depend upon one another.</li> <li>➤ Students need to understand their place value.</li> <li>➤ Students need to recognise and know the pattern of counting.</li> <li>➤ Students need to be able to apply their knowledge of counting to answer questions not just parrot-fashion learning.</li> <li>➤ Children need good numbers sense.</li> <li>➤ Be aware that there is more than one way of working things out.</li> <li>➤ That children need number knowledge to make sense of their world.</li> <li>➤ That children need to be able to move between the four operations effectively: understands meaning and connections.</li> <li>➤ That children need to be taught strategies to process numbers.</li> <li>➤ That estimation and recognising a reasonable answer are vital to the understanding number.</li> <li>➤ That children need to manipulate concrete objects before moving to the abstract.</li> <li>➤ That we immerse children in common mathematical language.</li> <li>➤ That children should be explicitly taught problem-solving strategies.</li> </ul>		<ul style="list-style-type: none"> <li>➤ Students need to use visual and concrete materials eg: number lines, 100 chart.</li> <li>➤ Students need to have a more positive attitude towards maths and their own ability.</li> <li>➤ Fractions</li> <li>➤ Relationship between numbers, enormity of numbers/evens, patterns.</li> <li>➤ Inverse relationship between + - / x □.</li> <li>➤ Mental strategies.</li> <li>➤ Numbers patterns, place value, expanded notation, money, estimation.</li> <li>➤ Use of calculator and other technologies sequencing numbers, averages, counting.</li> <li>➤ Number and picture stories.</li> <li>➤ Number questions.</li> <li>➤ Problem solving and open ended tasks.</li> <li>➤ Mental, pen and paper, calculator, concrete.</li> <li>➤ Revise, drill, and practise.</li> </ul>	

# Year 4 Level 4

## NUMBER & ALGEBRA

Number and Algebra are developed together, as each enriches the study of the other. Students apply number sense and strategies for counting and representing numbers. They explore the magnitude and properties of numbers. They apply a range of strategies for computation and understand the connections between operations. They recognise patterns and understand the concepts of variable and function. They build on their understanding of the number system to describe relationships and formulate generalisations. They recognise equivalence and solve equations and inequalities. They apply their number and algebra skills to conduct investigations, solve problems and communicate their reasoning

<b>Understanding</b>	<b>Fluency</b>	<b>Problem Solving</b>	<b>Reasoning</b>
<i>Understanding</i> includes making connections between representations of numbers, <b>partitioning</b> and combining numbers flexibly, extending <b>place value</b> to decimals.	<i>Fluency</i> includes recalling <b>multiplication</b> tables, communicating sequences of simple fractions, creating patterns with shapes and their transformations.	<i>Problem Solving</i> includes formulating, modelling and recording authentic situations involving operations, comparing large numbers with each other, and using properties of numbers to continue patterns	<i>Reasoning</i> includes using generalising from <b>number</b> properties and results of calculations, deriving strategies for unfamiliar <b>multiplication</b> and division tasks.

### What do I believe about number and algebra and learning how to work with number and algebraic concepts?

- Students needs concrete experience and access to resources to facilitate problem solving.
- Each day needs to contain a number task/moment.
- Instant recall of number facts are very important.
- All maths (number) concepts are related or depend upon one another.
- Students need to understand their place value.
- Students need to know/learn a common mathematical language.
- Students need to have a more positive attitude towards maths and their own ability.
- Students need to be able to extend their knowledge of counting to include fractional numbers.
- Need to understand the meaning behind the 'why' and the 'how' of mathematics.
- Exposure to different ways of working things out/finding solutions.
- Have awareness that there is more than one way of working things out and that resources can be utilised accordingly.
- Provide opportunities to learn at their level of understanding.
- Provide opportunities for children to revisit concepts not understood.

**Therefore, what do I need to do in my classroom? What do the children need? What equipment could I use?**

- We all need a common language.
- Teachers need to integrate concepts across the curriculum when appropriate.
- A variety of visual and concrete materials
- Using the four processes with whole numbers and decimals.
- Fractions – relationship between fraction, decimal fractions and percentages.
- Exploring the relationships between numbers and their patterns.
- Develop a variety of common strategies to solve problems.
- Encourage the use of mental computation where possible.
- Access technologies to solve problem
- Grouping in like ability when appropriate

# Year 5 Level 5

## NUMBER & ALGEBRA

Number and Algebra are developed together, as each enriches the study of the other. Students apply number sense and strategies for counting and representing numbers. They explore the magnitude and properties of numbers. They apply a range of strategies for computation and understand the connections between operations. They recognise patterns and understand the concepts of variable and function. They build on their understanding of the number system to describe relationships and formulate generalisations. They recognise equivalence and solve equations and inequalities. They apply their number and algebra skills to conduct investigations, solve problems and communicate their reasoning

Understanding	Fluency	Problem Solving	Reasoning
<i>Understanding</i> includes making connections between representations of numbers, using fractions to represent probabilities, comparing and ordering fractions and decimals and representing them in various ways	<i>Fluency</i> includes using estimation to check the reasonableness of answers to calculations	<i>Problem Solving</i> includes formulating and solving authentic problems using whole numbers and creating financial plans	<i>Reasoning</i> includes investigating strategies to perform calculations efficiently, continuing patterns involving fractions and decimals.

### What do I believe about number and algebra and learning how to work with number and algebraic concepts?

- Students needs concrete experience and access to resources to facilitate problem solving.
- Each day needs to contain a number task/moment.
- Instant recall of number facts are very important.
- All maths (number) concepts are related or depend upon one another.
- Students need to understand their place value.
- Students need to know/learn a common mathematical language.
- Students need to have a more positive attitude towards maths and their own ability.
- Students need to be able to extend their knowledge of counting to include fractional numbers.
- Need to understand the meaning behind the 'why' and the 'how' of mathematics.
- Exposure to different ways of working things out/finding solutions.
- Have awareness that there is more than one way of working things out and that resources can be utilised accordingly.
- Provide opportunities to learn at their level of understanding.
- Provide opportunities for children to revisit concepts not understood.

**Therefore, what do I need to do in my classroom? What do the children need? What equipment could I use?**

- We all need a common language.
- Teachers need to integrate concepts across the curriculum when appropriate.
- A variety of visual and concrete materials
- Using the four processes with whole numbers and decimals.
- Fractions – relationship between fraction, decimal fractions and percentages.
- Exploring the relationships between numbers and their patterns.
- Develop a variety of common strategies to solve problems.
- Encourage the use of mental computation where possible.
- Access technologies to solve problem
- Grouping in like ability when appropriate

# Year 6 Level 6

## NUMBER & ALGEBRA

Number and Algebra are developed together, as each enriches the study of the other. Students apply number sense and strategies for counting and representing numbers. They explore the magnitude and properties of numbers. They apply a range of strategies for computation and understand the connections between operations. They recognise patterns and understand the concepts of variable and function. They build on their understanding of the number system to describe relationships and formulate generalisations. They recognise equivalence and solve equations and inequalities. They apply their number and algebra skills to conduct investigations, solve problems and communicate their reasoning

Understanding	Fluency	Problem Solving	Reasoning
<i>Understanding</i> includes describing properties of different sets of numbers, using fractions and decimals to describe probabilities, representing fractions and decimals in various ways and describing connections between them, and making reasonable estimations	<i>Fluency</i> includes representing integers on a <a href="#">number line</a> , calculating simple percentages, using brackets appropriately, converting between fractions and decimals, using operations with fractions, decimals and percentages, and interpreting timetables	<i>Problem Solving</i> includes formulating and solving authentic problems using fractions, decimals and percentages	<i>Reasoning</i> includes explaining mental strategies for performing calculations, describing results for continuing <a href="#">number</a> sequences.

### What do I believe about number and algebra and learning how to work with number and algebraic concepts?

- Students needs concrete experience and access to resources to facilitate problem solving.
- Each day needs to contain a number task/moment.
- Instant recall of number facts are very important.
- All maths (number) concepts are related or depend upon one another.
- Students need to understand their place value.
- Students need to know/learn a common mathematical language.
- Students need to have a more positive attitude towards maths and their own ability.
- Students need to be able to extend their knowledge of counting to include fractional numbers.
- Need to understand the meaning behind the 'why' and the 'how' of mathematics.
- Exposure to different ways of working things out/finding solutions.
- Have awareness that there is more than one way of working things out and that resources can be utilised accordingly.
- Provide opportunities to learn at their level of understanding.
- Provide opportunities for children to revisit concepts not understood.



## Therefore, what do I need to do in my classroom? What do the children need? What equipment could I use?

- We all need a common language.
- Teachers need to integrate concepts across the curriculum when appropriate.
- A variety of visual and concrete materials
- Using the four processes with whole numbers and decimals.
- Fractions – relationship between fraction, decimal fractions and percentages.
- Exploring the relationships between numbers and their patterns.
- Develop a variety of common strategies to solve problems.
- Encourage the use of mental computation where possible.
- Access technologies to solve problem
- Grouping in like ability when appropriate