

## K-Year 2

### MEASUREMENT & GEOMETRY

Measurement and Geometry are presented together to emphasise their relationship to each other, enhancing their practical relevance. Students develop an increasingly sophisticated understanding of size, shape, relative position and movement of two-dimensional figures in the plane and three-dimensional objects in space. They investigate properties and apply their understanding of them to define, compare and construct figures and objects. They learn to develop geometric arguments. They make meaningful measurements of quantities, choosing appropriate metric units of measurement. They build an understanding of the connections between units and calculate derived measures such as area, speed and density.

Understanding		Fluency	Problem Solving	Reasoning
F	<i>Understanding</i> includes connecting names, numerals and quantities	<i>Fluency</i> includes comparing the lengths of objects	<i>Problem Solving</i> includes using materials to model authentic problems, and discussing the reasonableness of the answer	<i>Reasoning</i> includes explaining comparisons of quantities, and explaining processes for indirect comparison of length
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, and naming the days of the week	<i>Problem Solving</i> includes using materials to model authentic problems, giving and receiving directions to unfamiliar places, and using familiar counting sequences to solve unfamiliar problems and discussing the reasonableness of the answer	<i>Reasoning</i> includes explaining direct and indirect comparisons of length using uniform informal units.
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 using informal units iteratively to compare measurements, and describing and comparing time durations	<i>Problem Solving</i> includes formulating problems from authentic situations, making models and using <b>number</b> sentences that represent problem situations, and matching transformations with their original shape	<i>Reasoning</i> includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations, and creating and interpreting simple representations of <b>data</b>

<b>What do I believe about measurement and learning how to work with measurement 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>➤ Concrete materials</li> <li>➤ Play based experiences to apply concepts in different contexts</li> <li>➤ Purposeful and linked to familiar real life experience</li> <li>➤ Interest based</li> <li>➤ Introduce measurement vocabulary and terminology</li> <li>➤ Opportunity to use inquiry learning to explore concepts</li> <li>➤ Explicitly teach measurement strategies</li> </ul>	<ul style="list-style-type: none"> <li>➤ Counters</li> <li>➤ items indifferent sizes (ordering and sorting)</li> <li>➤ Playdough</li> <li>➤ Unifix cubes</li> <li>➤ String/tape measures</li> <li>➤ Natural resources – twigs, leaves, gum nuts, plants</li> <li>➤ Our own bodies</li> <li>➤ Days of the week/times of the day –clocks/calendars</li> <li>➤ Cups, jugs, and other concrete objects for measuring capacity/volume</li> <li>➤ Balance scales</li> <li>➤ Water and sand trolleys</li> <li>➤ Flashcards/visual cues</li> <li>➤ Pattern Blocks</li> <li>➤ Maps</li> </ul>

## Year 3 Level 3

### MEASUREMENT & GEOMETRY

Measurement and Geometry are presented together to emphasise their relationship to each other, enhancing their practical relevance. Students develop an increasingly sophisticated understanding of size, shape, relative position and movement of two-dimensional figures in the plane and three-dimensional objects in space. They investigate properties and apply their understanding of them to define, compare and construct figures and objects. They learn to develop geometric arguments. They make meaningful measurements of quantities, choosing appropriate metric units of measurement. They build an understanding of the connections between units and calculate derived measures such as area, speed and density.

<b>Understanding</b>	<b>Fluency</b>	<b>Problem Solving</b>	<b>Reasoning</b>
<i>Understanding</i> includes connecting <b>number</b> representations with <b>number</b> sequences, <b>partitioning</b> and combining numbers flexibly, representing unit fractions, using appropriate language to communicate times, and identifying environmental symmetry	<i>Fluency</i> includes recalling <b>multiplication</b> facts, using familiar metric units to order and compare objects, interpreting maps and communicating positions	<i>Problem Solving</i> includes formulating and modelling authentic situations involving planning methods of <b>data</b> collection and representation, making models of three-dimensional objects and using <b>number</b> properties to continue <b>number</b> patterns	<i>Reasoning</i> includes using generalising from <b>number</b> properties and results of calculations and comparing angles.
<b>What do I believe about measurement and learning how to work with measurement concepts?</b>	<b>Therefore, what do I need to do in my classroom? What do the children need? What equipment could I use?</b>		

- Concrete materials
- Purposeful and linked to familiar real life experience
- Interest based
- Opportunity to use inquiry learning to explore concepts
- Explicitly teach measurement strategies
- Shared language that be used consistently in everyday communication..
- Estimation skills are a vital part of developing a concept of measurement.
- That in order to understand measurement concepts, there needs to be an understanding of number and space concepts.

- Counters
- items indifferent sizes (ordering and sorting)
- Unifix cubes
- String/tape measures
- Our own bodies
- Days of the week/times of the day –clocks/calendars
- Cups, jugs, and other concrete objects for measuring capacity/volume
- Balance scales
- Water and sand trolleys
- Flashcards/visual cues
- Pattern Blocks
- Maps
- Children distinguish perimeter, area, volume, time and length, etc.
- Sequence of learning Concrete (Hands-on), drawings, formula.
- Arbitrary units of measurement to more formal measurement units.
- Conversions.
- Estimate first and improve as a result of testing.
- Know which piece of equipment would be needed to measure – what form of measurement was required.
- Read times tables, analogue or 24 hour clocks, etc.
- Through activities, children are given the opportunity to learn measurement facts/language.
- In our incidental communication with children, measurement language is regularly used.
- Provide opportunities for estimation and model.
- That we do not teach measurement in isolation.
- Provide related activities and explicitly make the connections between the mathematical concepts.

# Year 4 Level 4

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<b>Understanding</b>	<b>Fluency</b>	<b>Problem Solving</b>	<b>Reasoning</b>
<p><i>Understanding</i> includes making connections between representations of numbers, <b>partitioning</b> and combining numbers flexibly, extending <b>place value</b> to decimals, using appropriate language to communicate times, and describing properties of <b>symmetrical</b> shapes</p>	<p><i>Fluency</i> includes using instruments to measure accurately, creating patterns with shapes and their transformations.</p>	<p><i>Problem Solving</i> includes formulating, modelling and recording authentic situations involving operations, comparing large numbers with each other, comparing time durations.</p>	<p><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, comparing angles.</p>
<p><b>What do I believe about measurement and learning how to work with measurement 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>➤ Shared language.</li> <li>➤ Used frequently in many real life situations: time, building, cooking, etc.</li> <li>➤ That measurement and geometry skills need to be learnt in context.</li> <li>➤ Estimation skills are a vital part of developing a concept of measurement.</li> <li>➤ That in order to understand measurement concepts, there needs to be an understanding of number and space concepts.</li> <li>➤ Identifying the relationship between shapes and our environment.</li> <li>➤ Need an awareness of shapes, their functions and properties.</li> <li>➤ Choose appropriate units to measure.</li> <li>➤ Be able to convert between units of measurement.</li> <li>➤ Spatial awareness.</li> <li>➤ Links to other learning areas.</li> </ul>		<ul style="list-style-type: none"> <li>➤ Need to distinguish between perimeter, area, volume, time and length, etc.</li> <li>➤ Sequence of learning is: Concrete (Hands-on)&gt;drawings&gt;formula.</li> <li>➤ Non-standard units of measurement to more formal measurement units.</li> <li>➤ Teach conversions.</li> <li>➤ Estimate first and improve as a result of testing.</li> <li>➤ Providing appropriate measuring equipment.</li> <li>➤ Read timetables, analogue or 24 hour clocks, etc.</li> <li>➤ Through activities, children are given the opportunity to learn measurement facts/language.</li> <li>➤ Measurement language is regularly used across the Learning Areas.</li> <li>➤ Model and provide opportunities for estimation.</li> <li>➤ Provide related activities and explicitly make the connections between the mathematical concepts.</li> </ul>	

# Year 5 Level 5

## MEASUREMENT & GEOMETRY

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Understanding	Fluency	Problem Solving	Reasoning
<p><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, describing transformations and identifying line and rotational symmetry</p>	<p><i>Fluency</i> includes choosing appropriate units of measurement for calculation of <b>perimeter</b> and area, using estimation to check the reasonableness of answers to calculations and using instruments to measure angles</p>	<p><i>Problem Solving</i> includes formulating and solving authentic problems using whole numbers and measurements and creating financial plans</p>	<p><i>Reasoning</i> includes investigating strategies to perform calculations efficiently, continuing patterns involving fractions and decimals.</p>
<p><b>What do I believe about measurement and learning how to work with measurement 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>➤ Shared language.</li> <li>➤ Used frequently in many real life situations: time, building, cooking, etc.</li> <li>➤ That measurement and geometry skills need to be learnt in context.</li> <li>➤ Estimation skills are a vital part of developing a concept of measurement.</li> <li>➤ That in order to understand measurement concepts, there needs to be an understanding of number and space concepts.</li> <li>➤ Identifying the relationship between shapes and our environment.</li> <li>➤ Need an awareness of shapes, their functions and properties.</li> <li>➤ Choose appropriate units to measure.</li> <li>➤ Be able to convert between units of measurement.</li> <li>➤ Spatial awareness.</li> <li>➤ Links to other learning areas.</li> </ul>		<ul style="list-style-type: none"> <li>➤ Need to distinguish between perimeter, area, volume, time and length, etc.</li> <li>➤ Sequence of learning is: Concrete (Hands-on)&gt;drawings&gt;formula.</li> <li>➤ Non-standard units of measurement to more formal measurement units.</li> <li>➤ Teach conversions.</li> <li>➤ Estimate first and improve as a result of testing.</li> <li>➤ Providing appropriate measuring equipment.</li> <li>➤ Read timetables, analogue or 24 hour clocks, etc.</li> <li>➤ Through activities, children are given the opportunity to learn measurement facts/language.</li> <li>➤ Measurement language is regularly used across the Learning Areas.</li> <li>➤ Model and provide opportunities for estimation.</li> <li>➤ Provide related activities and explicitly make the connections between the mathematical concepts.</li> </ul>	

# Year 6 Level 6

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Understanding	Fluency	Problem Solving	Reasoning
<p><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</p>	<p><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, measuring using metric units, and interpreting timetables</p>	<p><i>Problem Solving</i> includes formulating and solving authentic problems using fractions, decimals, percentages and measurements, and finding the size of unknown angles</p>	<p><i>Reasoning</i> includes explaining mental strategies for performing calculations, describing results for continuing <a href="#">number sequences</a> and explaining the <a href="#">transformation</a> of one shape into another.</p>
<p><b>What do I believe about measurement and learning how to work with measurement 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>➤ Shared language.</li> <li>➤ Used frequently in many real life situations: time, building, cooking, etc.</li> <li>➤ That measurement and geometry skills need to be learnt in context.</li> <li>➤ Estimation skills are a vital part of developing a concept of measurement.</li> <li>➤ That in order to understand measurement concepts, there needs to be an understanding of number and space concepts.</li> <li>➤ Identifying the relationship between shapes and our environment.</li> <li>➤ Need an awareness of shapes, their functions and properties.</li> <li>➤ Choose appropriate units to measure.</li> <li>➤ Be able to convert between units of measurement.</li> <li>➤ Spatial awareness.</li> <li>➤ Links to other learning areas.</li> </ul>		<ul style="list-style-type: none"> <li>➤ Need to distinguish between perimeter, area, volume, time and length, etc.</li> <li>➤ Sequence of learning is: Concrete (Hands-on)&gt;drawings&gt;formula.</li> <li>➤ Non-standard units of measurement to more formal measurement units.</li> <li>➤ Teach conversions.</li> <li>➤ Estimate first and improve as a result of testing.</li> <li>➤ Providing appropriate measuring equipment.</li> <li>➤ Read timetables, analogue or 24 hour clocks, etc.</li> <li>➤ Through activities, children are given the opportunity to learn measurement facts/language.</li> <li>➤ Measurement language is regularly used across the Learning Areas.</li> <li>➤ Model and provide opportunities for estimation.</li> <li>➤ Provide related activities and explicitly make the connections between the mathematical concepts.</li> </ul>	