

Intensive English Language / New Arrivals Program

Mathematics and Numeracy: Teaching Learning Sequence

Strand	Measurement and geometry
Sub-strand	Using units of measurement: length
Levels	A B C Reception, Year 1, Year 2
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Year developed	2016

Use this units with your own student cohort

Teachers are invited to trial and modify this teaching learning sequences. Content may need to be modified to meet the particular learning needs of a student cohort. Designers started with the same template, and while there was broad agreement on the use of the template – there may be some variations between this Teaching Learning Sequence and other Teaching Learning Sequences that were developed by DECD educators.

- differentiated activities may be found in either the activities column or the evidence and differentiation column
- generally, language elements were not repeated once they were recorded in an earlier activity
- cross curriculum priorities are included in some unites but not in others.

A feedback form is available at tiny.cc/IELP-NAP-TLS. Please forward feedback to [Erika Vonaspem](mailto:Erika.Vonaspem)

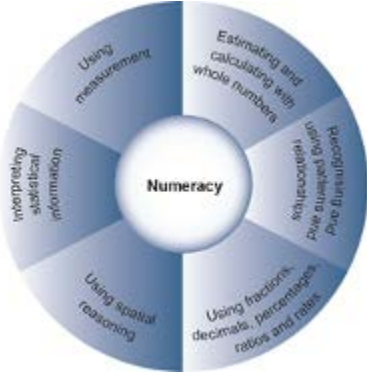


Intensive English Language / New Arrivals Program

Mathematics and Numeracy Teaching Learning Sequence

WHAT DO WE WANT STUDENTS TO LEARN?				
Strand: Measurement and Geometry Substrand: Using Units of Measurement. - Length		Learning Goals		
		Achievement Standards	Content Descriptions	Proficiencies
Mathematics Levels: A B C (Year R, 1, 2)	Time Line: 2 weeks	A Compare the length of objects	A Understands that an object from their everyday lives can be measured. A Begins to use everyday language to describe attributes. A.....Begins to use comparative language of measurement.	The student demonstrates the following proficiencies. Understanding <ul style="list-style-type: none"> Compares several 2D and 3D objects using uniform informal units on length.
Overarching Ideas Length can be measured in four methods. Direct and indirect comparison and direct and indirect measurement. Length is a measureable attribute of objects and spaces. Length can be described by using every day comparative language. Length can be estimated or measured using uniform informal units and formal units.		B Orders the lengths of objects using informal units.	B Understands that informal units of measurement must be of a regular size. B Understands that accuracy is important and so puts informal units end to end to measure the whole object. B Measures the lengths of the pairs of objects using uniform informal units. B Compares the lengths of pairs or objects using uniform informal units.	Fluency <ul style="list-style-type: none"> Sort objects according to length. Measures the length of objects and shapes using uniformed informal units. Reasoning <ul style="list-style-type: none"> Compares the lengths of pairs of objects using uniform informal units Describes length using everyday language. Problem-solving <ul style="list-style-type: none"> Choose the appropriate uniform informal units to measure length.
		C Orders several 2D shapes and 3D objects using uniform informal units based on length.	C Measures length using shapes and objects and uniform informal units. C When measuring 2D and 3D objects chooses appropriate informal units to measure length. C Compares several 2D shapes and 3D objects using uniform informal units based on length.	

WHAT DO WE WANT STUDENTS TO LEARN?

Numeracy General Capability	Other General Capabilities	Cross Curriculum Priorities
<p>Recognising and Using Patterns and Relationships</p> <p>Level 1a</p> <p>Use informal language and or actions to describe characteristics of length, temperature, mass, volume, capacity and area in familiar environments.</p>  <p>Level 1b</p> <p>Measure by comparing objects and indicate if these measurements are the same or different.</p> <p>Level 2</p> <p>Estimate, measure and order using direct and indirect comparisons and informal units to collect and record information about shapes and objects.</p>	<p><input type="checkbox"/> Literacy</p> <p>The literacy capability of <i>Composing Texts</i> is guided by and reported in the sequence of the IELP Progress Report. In addition, the following aspects of the <i>Comprehending Texts</i> continuum are taught and assessed.</p> <p>Level 1e</p> <p>Comprehend texts</p> <ul style="list-style-type: none"> • Navigate, read and view learning area texts with familiar vocabulary and supportive illustrations • Listen and respond to learning area texts (brief questions, one and two step instructions, and listen for information in simple spoken texts) • Interpret simple texts using comprehension strategies <p>Level 2</p> <p>Navigate, read and view learning area texts</p> <ul style="list-style-type: none"> • Navigate, read and view texts with illustrations and simple graphics <p>Listen and respond to learning area texts</p> <ul style="list-style-type: none"> • Listen to two or more step instructions for undertaking learning tasks, listen for information about topics being learned in spoken and audio texts, including audio-visual texts, and respond to texts read aloud. 	<p><input type="checkbox"/> Aboriginal and Torres Strait Islander histories and cultures</p> <p>Aboriginal and Torres Strait Islander Peoples' ways of life are uniquely expressed through ways of being, knowing, thinking and doing. (Rainbow Snake expresses indigenous people's relationship with the land)</p> <p><input type="checkbox"/> Asia and Australia's engagement with Asia</p> <p>Explore and investigate measurement in other cultures including Asia.</p> <p>See 'Mathematics in many cultures' in Activity 4.1.</p>

HOW WILL WE KNOW IF THEY'VE LEARNT IT?


Diagnostic Assessment: (What do the students bring?)	Assessment of Learning	Assessment as Learning	Assessment for Learning
<p><u>Dispositions</u></p> <p>Children are natural investigators. They learn through play, investigating and experimenting with a variety of concrete materials.</p> <p>Sample of personal assessment by teacher: Observing children in sandpit building sand constructions and recording language being used.</p> <p><u>Knowledge Skills/Understandings</u></p> <p>Younger children are developing skills to distinguish different sizes and shapes through use of concrete materials.</p> <p>Students are able to distinguish the difference between lengths of objects and can measure using informal comparisons.</p> <p>Students recognise and use numbers when using formal units.</p>	<p>Observations of indirect comparisons and ordering of different lengths, using technical language to describe findings.</p> <p>Top 5 Assessment Sheet containing photos as evidence of student learning. (See Appendix)</p> <p>Progress Report records the control over language when describing measurement in length</p>	<p>Students take photos of their measurements and upload onto a Top 5 summative assessment sheet.</p> <p>Record measurement findings in maths book.</p>	<p>Students work in groups to share and report findings, discuss variation of lengths. What did students notice? Differences, similarities?</p>

KEY



Content Descriptions are in plain font

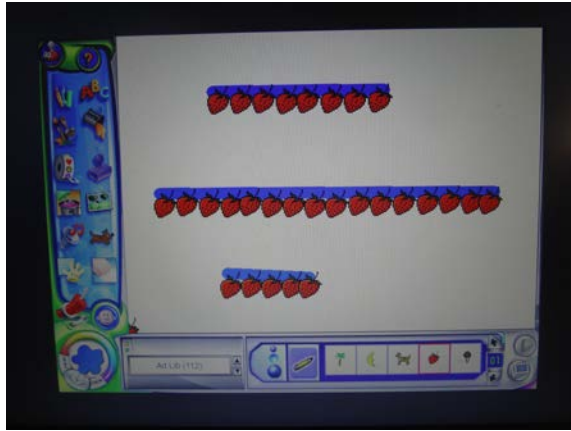
Achievement Standards: Bold font

Numeracy Learning Continuum Description. Underlined font

WHAT DO WE WANT STUDENTS TO LEARN?	WHAT WILL WE DO TO GET THERE?			HOW WILL WE KNOW IF THEY'VE LEARNT IT?
Mathematical Skills and Concepts	Sequenced learning activities	Language Elements	Resources	Evidence and Differentiation
<p>A Understands that objects from their everyday lives can be measured.</p> <p>A. Begins to use everyday language to describe attributes.</p>	<p>1.1 Measurement Talking Tub</p> <p>Teacher creates a 'talking/measuring tub' containing various measuring objects and items including: tape measure, clock, ruler, egg-timer, stop watch, kitchen scales, unifix blocks and thermometer, time language cards, hand cut-outs, giant feet cut-outs, string, rope, straws, paper clips etc.</p> <p>These units connect the concept and purpose of measurement to everyday life situations e.g. measuring when cooking, measuring temperature, measuring speed,</p> <p>You are not teaching how to use these objects or their metric units. The purpose is to make students aware of why and how we measure in a variety of contexts and to establish prior knowledge.</p> <p>In a circle teacher directs student discussion of objects: What are these objects used for? Discuss that different objects/properties can be measured. What do they measure? Discuss 'length'. What has length?</p> <p>Begin word wall on length e.g add definition of measurement and length.</p> 	<p>Participants: names of objects being explored. <i>tape measure, block, ruler,</i></p> <p>Describers: <i>heavy, light, hot, cold, long, short, fast, slow,</i></p> <p>Technical language: <i>length, measure</i></p> <p>Nominalisations: <i>size, weight, temperature, amount, time</i></p> <p>Processes: <i>measure, sort, put, group, match, use</i></p> <p>Word order in questions and responses: <i>What could this measure? This could measure.....</i></p> <p>Compound sentences: <i>This is a tape measure /thermometer/stopwatch and it measures how long/ hot /fast something is. Length is how long something is.</i></p> <p>Simple Sentences <i>A table has length. A person has length. A wall has length.</i></p> <p>Complex Sentence</p>	<p>interlocking cubes Unifix cubes bottle lids dominoes attribute blocks counters popsticks stop watch tape measure clock blocks string ruler thermometer, scales egg-timer language cards hand cut-outs giant feet cut-outs string rope straws paper clips</p> <p>Word wall on length</p>	<p>Top 5</p> <p><input type="checkbox"/> I understand that we measure different things in everyday life</p> <p>If NO, then...</p> <p>Provide more tactile activities and resources and examples of measuring e.g. find pictures on the internet. Watch Youtube clip on measurement demonstrating a variety of things in the talking tub in use in everyday life. https://www.youtube.com/watch?v=wCkv_aoc7M8&list=PL-OIJZ2hunTlq-hmT6wdVGA6XbPxkb-Ge</p> <p>If YES, then.</p> <p>Ask students to represent or draw items that can be measured with a eg thermometer, kitchen scales, stop watch.</p>

		<p>Non-finite clause: <i>We measure to know how big or small something is. We measure to know how fast or slow something is. We measure to know how heavy or light something is</i></p>		
<p>A. Begins to use comparative language of measurement.</p> <p>B. Measures and compares the lengths of pairs of objects using uniform informal units.</p>	<p>2.1 Rainbow Snake Teacher to read <i>Warnayarra the Rainbow Snake</i> Dreamtime Story compiled by Pamela Lofts (Scholastic). Discuss the size of the Rainbow Snake in comparison to real life snakes. Teacher draws a large snake (Rainbow Snake) on brown paper and discusses with students how big/long is it? What could we use to measure the length of the snake? Teacher models using string, Unifix blocks, hands, or other informal units to measure the length. Then students work in groups to measure the length of the snake using informal units of their choice. Introduce the word, unit. 'We can measure the snake with different units. A unit is the thing we use to measure the snake. The unit can be shoes, rulers, shells, hands, etc.' Reflection: As a class, students discuss findings and what they have used to measure the snake and why. Record on snake/class display which informal units were appropriate</p> <p>2.2 Playdough snakes Students use playdough to make snakes of different lengths. Teacher models language e.g. This snake is the longest. Directly compare two snakes and use comparative language to describe their length, eg this snake is longer than your snake. Add length language to word wall. e.g. long, short, big, small. Students estimate how many units of length their longest snake will be if using the same unit to measure the snake. Discuss the need for a smaller unit.</p>	<p>Participants: <i>snake</i></p> <p>Technical language: <i>unifix blocks,</i></p> <p>Describers: <i>huge, very long, enormous,</i></p> <p>Complex sentences <i>The Rainbow Snake is 20 hands long, if I use my hands. It is 9 rulers long if I use rulers. It is 10 pencil cases long, if I use pencil cases.</i></p> <p>Comparative Language: <i>much bigger than, longer, longest, shorter, shortest</i> <i>A hand is better than a ruler to measure the snake because it can bend.</i> <i>Plastic cups are better than boxes to measure the snake because they are the same size.</i></p> <p>Processes: <i>make, roll, compare, describe, tell,</i></p>	<p>Childrens Picture Fiction <i>Warnayarra the rainbow snake</i> Dreamtime Story compiled by Pamela Lofts (Scholastic). Large sheet of brown paper Playdough</p> <p>Uniform/non-uniform units of measurement interlocking cubes Unifix cubes beads buttons bottle lids attribute blocks counters pop sticks feathers paperclips pasta keys shells ribbons pebbles 2D shapes</p>	<p>Top 5</p> <p><input type="checkbox"/> I can measure length using informal units.</p> <p>If NO then..... Watch the following link, which demonstrates how to measure using informal units.</p> <p>https://www.youtube.com/watch?v=1faq0bfQVaQ</p> <p>Teacher can then model and work with a small group or one on one to clarify understanding.</p> <p>If YES..... Students can explain why some unit choices are better than others.</p> <p>Students investigate the measurement of other objects in the class by using informal units of measurement.</p>

<p>C. When measuring 2D objects selects appropriate informal units to measure length.</p>	<p>Students choose an appropriate informal unit from the collection in the Resource column.</p> <p>Provide language scaffold if necessary to record the length of the objects being compared.</p>  	<p>Simple sentences: <i>This short snake is 8 beads long. This long snake is 12 beads long.</i></p>		
<p>B. Understands that informal units of measurement must be of a regular size.</p> <p>B. Understands accuracy is important by putting informal units end to end to measure the whole object.</p>	<p>3.1 KIDPIX lengths</p> <p>Using Kidpix teacher to model drawing 3 snakes and using a stamp as an informal unit to measure the length by repeated stamping along the line. Accuracy is important making sure stamps touch end to end along the line. Students to compare and discuss their work with a partner.</p>	<p>Participants: <i>stamp, lines</i></p> <p>Describers: <i>same,</i></p> <p>Processes: <i>put, stamp, find, order, estimate, guess,</i></p> <p>Circumstance: <i>again, along, about,</i></p>	<p>Computer resources</p>	<p>Top 5</p> <p>I can lay informal units end to end so I can measure accurately.</p> <p>If NO then.....</p> <p>Students can repeat activity using a line on paper and the use of just one concrete informal unit to measure, to develop unit</p>



3.2 Longer than and shorter than (indirect comparison)

Teacher to measure with students the length of their foot, from the heel to the big toe with string. Cut the string at this length. Students to find objects inside the classroom and before measuring estimate what they think will be longer and shorter than their foot using their individual piece of string. Students to record their findings.

Questions

What did you find longer than your foot?
 What was shorter than your foot?
 Can you find an object which is longer than your foot but shorter than your friend's foot?
 Students order the lengths of string from shortest to longest as a class.

Commands: *Put the stamps on the snake. Measure the object. Order the lengths. Compare the lengths.*

familiarity.
 If YES then....
 Students to record measurements.

Top 5
 I can find something the same length, longer than and shorter than my foot.

If NO then.....
 teacher to facilitate a small group comparing two objects of different lengths. Asking questions such as which one is longer? Which one is shorter? Can you find two the same in length?

If YES then.....
 Students can record their findings of comparisons.

B Orders the lengths of objects using informal units

4.1 How big is your hand

Teacher to read Mathematics From Many Cultures big book to introduce different cultural origins of measurement. Students draw an outline of their hand and mark the length to be measured by using markers such as a green dot at the start and a red dot at the end.

Technical language:
uniform informal unit, objects
Participants: *hand*

Big Books 'Mathematics in many cultures'

Top 5
 I can measure an object using the same material.

<p>B Measures and compares the lengths of objects using uniform informal units.</p>	<p>Students are given unifix blocks to measure the length of their own hand. Using other informal units, students repeat the activity and discuss why the results are different. Students to draw and record their findings/ take photos for class maths journal. Add new vocabulary to word wall.</p> <p>4.2 Measuring our body How can we measure our bodies? What can we measure? e.g. height, length of feet, arms etc. Students discuss and brainstorm in pairs (think/pair/share). Model tracing a student's body outline onto large brown paper. Teacher to demonstrate drawing a start point and end point on a body part to measure e.g from shoulder to fingertip to measure length of arm. Reflect on class display/list of appropriate informal units (from Activity 1.2) for students to use to measure length of body parts. Teacher to lead discussion that an informal unit must be of a regular size. Students work in groups to trace and measure 1 student. They choose an appropriate informal unit to measure arm span, leg span and record results in a graph. Reflection: Discuss groups results as a class</p> <p>4.3 How big is your desk? Teacher to demonstrate using the hand as an informal unit to measure the length of a desk. Ensure accurate measurement by putting the informal units end to end. Students can create a tape measure using their hand print as a repeated unit. This is done by photocopying students traced hand print on an A4 or A3 paper. Students to lay their hands end to end and glue onto a long strip of paper for e.g. freeze tape. Student then are to use their hand tape measure to measure objects in the room.</p> <p>Questions : Why did different students obtain different measurements for the same object? How did you calculate the measurement if not a whole hand print was used? eg 5 ½ hand prints.</p>	<p>Processes: <i>take, draw, mark, record, reflect, discuss</i></p> <p>Circumstances: <i>end to end</i></p> <p>Commands: <i>Draw outline, record length, choose an appropriate uniform informal unit.</i></p> <p>Simple sentences: <i>I am taller. I am the shortest.</i></p> <p>Complex sentence: <i>Our measurements (answers) were not the same because we used different units, because we didn't put the units end-to-end, because the pop sticks were not straight, etc.</i> <i>The length of my arm is different to my friends because my arm is shorter.</i></p> <p>Comparative Language <i>Thom's arm is 6 popsticks shorter than his leg. much bigger than, longer, longest, shorter, shortest</i></p>	<p>Coloured markers/textas</p> <p>Paper</p> <p>Various informal units (see list in Activity 2.1)</p> <p>Large brown paper</p> <p>Pencils/textas</p>	<p>If NO, then... Repeat comparisons of length using manipulative material. Focusing on the language such as same, longer than, shorter than.</p> <p>If YES, then... Increase the complexity of the measurement. Experiment with a variety of different materials to measure and report back findings.</p> <p>Begin to introduce the ruler as a formal unit of measure if non-standard units have served their purpose: understanding purpose and technique of measuring length.</p>
<p>B Understands that accuracy is important by putting informal units end to end to measure the whole object.</p>			<p>Maths books and or A3 paper to record their results.</p>	



B,C. Orders the lengths of objects using informal units.

4.4 Ordering lengths (direct comparison)

Students engage in a variety of height ordering activities within the classroom. 'Find a classmate shorter and taller than you.' Class to order from tallest to shortest and record results.

4.5 Magazine Tear

Students are given a magazine page and are to tear it in one long continuous strip, making it as long as possible. Students compare and order their strips from shortest to longest. Students to measure using an appropriate informal unit and then record the longest and shortest in length.

Magazine pages

C. Orders several 2D shapes and 3D objects using uniform informal units based on length.

C Measures length using shapes and objects and uniformed informal units.

5.1 Personal Benchmarks

Students to measure the length of different body parts eg foot, hand span (open and closed), wrist, head, height to shoulder). Some may be useful benchmarks for standard units, (eg wrist to elbow = a ruler) and some for single units (eg fingernail width=1 cm). Students discuss variations in body measurements and compare results. Order personal benchmarks from shortest to longest and record results

Processes
measure, record, walk, discuss, compare

Informal units such as, those in the measuring tub

Make your own ruler

I can order and compare lengths.

If NO then
Teacher to place a line of masking tape along the classroom floor. Placing various objects on the line to be measure, so that the bottom end of all objects are sitting on the line. Teacher to ask which object is

<p><u>C</u> When measuring 2D and 3D objects and spaces, chooses appropriate informal units to measure length.</p> <p><u>C</u> Compares several 2D shapes and 3D objects using uniform informal units based on length.</p>	<p>5.2 Estimating and measuring distance Students to choose informal units to measure from the classroom door to different areas in the school, eg to the canteen, the office and the library.</p> <p>Using crooked or curvy paths or line son the floor, students determine which path is longest, next longest, etc. If you wish to offer a hint, give students a piece of string longer than the path. Students explain how they solved the problem. You may need to tape the end of the string to the beginning of the path. Use a second piece of string to measure another path or line. Students compare the string lengths.</p> <p>Run a piece of tape along the dimensions of objects in the classroom to be measured, including curves and other distances that are not straight lines.</p>	<p>Technical Language <i>distance</i></p>		<p>the longest? Comparing objects, is this object longer than this object?</p> <p>If YES then..... Find ten objects from outside in the school gardens and grounds. Students to then order objects from shortest to longest. They can discuss their finding with a partner.</p>
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Overview of language and examples used in the teaching, learning and assessing program





A summary of the language mostly pertaining to this substrand as used in the following teaching, learning and assessing program.

Oral Texts	Visual Texts and Symbols	Text Knowledge	Grammar Knowledge	Word Knowledge
<p>Spoken Texts Participation in oral texts to</p> <ul style="list-style-type: none"> • explore understandings about measurement • ask questions <p>convey knowledge about measurement</p> <p>Participate in short simple texts where there are repeated memorisable items such as sentence structures and vocabulary</p> <p>Verbal elements Understands and composes statements, questions and commands with appropriate volume, intonation and stress in familiar contexts with familiar people.</p> <p>Pronunciation of less familiar words, repeating if necessary. <i>Eg naming objects in talking tub.</i></p>	<p>Visuals in Multimodal texts Uses visual images to construct meaning of measurement Uses photos and drawings with brief text to convey and extend meanings made in the visuals.</p> <p>Symbolism Representation of an object as a repeating unit to measure things</p> <p>Semiotics Placement of measurement unit at 0 length End to end placement of repeating unit.</p>	<p>Written texts Explore purpose, structure and language features of a simple</p> <ul style="list-style-type: none"> - description - definition - explanation <p>Writes simple phrases to describe and accompany visuals. <i>e.g describing the length of snakes or drawings of classroom objects.</i></p> <p>Text organisers / connectives Uses highly repetitive sentence beginnings usually reference items <i>e.g The desk..., The snake...My arm..., My leg...</i></p>	<p>Simple sentences <i>e.g This snake is long. My desk is 42 blocks long.</i></p> <p>Compound sentences <i>e.g Measure the length and compare.</i></p> <p>Complex sentences <i>e.g Our answers were different because the straws were not straight.</i></p> <p>Processes</p> <ul style="list-style-type: none"> - Relational <i>e.g A book has length.</i> - action <i>e.g I measure...</i> - mental <i>eg I think this book is larger than my foot.</i> <p>Tense Simple present and past tense with regular verbs: <i>e.g I can measure. I measured.</i> Irregular verbs: <i>e.g Put the objects in order. I put ...</i> Multi-word verb groups: <i>e.g doesn't equal can order,</i></p> <p>Subject Verb Agreement <i>eg It goes, There are</i></p>	<p>Topic Vocabulary related to measurement specific to length <i>e.g long, short, longer than, shorter than, same as, informal unit, estimate.</i></p> <p>Spelling Increasing use of the conventions of spelling</p>

<p>Speech functions Follow and give commands</p> <p>Respond to and ask questions</p> <p>Constructs statements to describe length and learning</p> <p>Social exchanges Build and maintain relationships through appropriate social language</p>		<p>Reference items Uses a limited range of reference items</p> <ul style="list-style-type: none"> - possessive pronouns e.g <i>my snake your snake</i> - third person pronouns e.g <i>it is longer, he is taller, she is shorter</i> - demonstrative pronouns e.g <i>this</i> (pointing to object) is longer 	<p>Circumstances</p> <ul style="list-style-type: none"> - place e.g <i>I put five hands along the line.</i> - manner: e.g <i>end to end</i> <p>Nouns and Noun Groups with describers Expand noun groups using describers Eg <i>my hand is 10 Unifix blocks.</i></p> <p>Evaluative language Express opinions using mental processes e.g. <i>I think the book is longer than my foot.</i></p> <p>Modality and graduation Comparatives of regular adjectives. <i>short, shorter, shortest.</i> Basic auxiliaries, <i>can</i> Intensity: <i>many, lots, very tall</i></p>	
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Appendix

Top 5		
	Learning Goal	Evidence of Learning
	I understand that we can measure different objects in life.	
	I can measure length using informal units.	
	I can lay informal units end to end so I can measure accurately.	
	I can find something the same length, longer than and shorter than my foot or other objects.	
	I can measure an object using the same unit.	
Student Comment:		
Teacher Comment:		