

Context:

This module provides students with the mathematical knowledge, understanding and skills to solve problems relating to operations with whole numbers, distance, area, volume and time. Students are provided with opportunities to extract and interpret information from a variety of simple forms of data representation that are used in everyday contexts. Teachers are encouraged to apply the content of this module in contexts which are meaningful and of interest to their students. The numerical focus for the module is whole numbers.

This module introduces students to the Numerical Reasoning and Mathematical Thinking (NRMT) process. This process includes the following steps:

- interpreting the task and the key information to identify the problem
- choosing knowledge and skills which could help to solve the problem
- applying their existing knowledge and strategies to obtain a solution
- reflecting on the solution in relation to the context
- communicating the solution to the problem.

In this module, the NRMT process needs to be taught explicitly, with students practising and using each of the steps as they learn to choose and use the four operations to solve everyday problems related to the three numeracy contexts: personal and community, workplace and employment, and education and training.

Syllabus Content: **Module 1 – Numeracy**

- N6-1.1 – recognises and applies functional numeracy concepts in practical situations, including personal and community, workplace and employment, and education and training contexts
- N6-1.2 – applies numerical reasoning and mathematical thinking to clarify, efficiently solve and communicate solutions to problems
- N6-1.3 – determines whether an estimate or an answer is reasonable in the context of a problem, evaluates results and communicates conclusions
- N6-2.1 – chooses and applies appropriate operations with whole numbers, familiar fractions and decimals, percentages, rates and ratios to analyse and solve everyday problems
- N6-2.2 – chooses and applies efficient strategies to analyse and solve everyday problems involving metric relationships, distance and length, area, volume, time, mass, capacity and temperature
- N6-2.3 – chooses and applies efficient strategies to analyse and solve everyday problems involving data, graphs, tables, statistics and probability
- N6-3.1 – chooses and uses appropriate technology to access, organise and interpret information in a range of practical personal and community, workplace and employment, and education and training contexts

- N6-3.2 – chooses and uses appropriate technology to analyse and solve problems, represent information and communicate solutions in a range of practical contexts

Student Outcomes: N6 - 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2

	Student is able to:	Implications, considerations and implementations	Resources
Module 1.1: Whole Numbers			
(i)	<ul style="list-style-type: none"> • identify and discuss situations which involve the use of whole numbers in everyday situations and in various texts and media 		
(ii)	<ul style="list-style-type: none"> • order and compare whole numbers into the millions 		
(iii)	<ul style="list-style-type: none"> • use place value to understand the meaning and magnitude of whole numbers into the millions and beyond 		
(iv)	<ul style="list-style-type: none"> • determine an estimation of a quantity and its reasonableness 	<ul style="list-style-type: none"> • interpret the relative size of a quantity and round to estimate answers • identify whether an estimation or an accurate answer is needed in everyday situations 	
(v)	<ul style="list-style-type: none"> • recognise and use patterns in the number system 	<ul style="list-style-type: none"> • understand the relationship between the place value and position of digits in determining the magnitude of the number • understand the role of zero and determine the impact of the position of zero in a number 	
(vi)	<ul style="list-style-type: none"> • understand and use simple negative numbers on a number line PLO 		
(vii)	<ul style="list-style-type: none"> • discuss the meaning and use of negative numbers that represent real-life situations such as, above and below sea level, debits and credits, temperature scales 		

Module 1.2: Operations with Whole Numbers

(i)	<ul style="list-style-type: none">• use various addition and subtraction strategies for mental calculations with whole numbers, where efficient for the given numbers.	<p>Strategies include:</p> <ul style="list-style-type: none">• counting-on strategies• using doubles and near doubles• combining numbers that add to 10• bridging to 10 and decades• using place value to partition numbers• partitioning numbers in non-standard forms• manipulating place value of numbers flexibly in regrouping• jump strategy• split strategy• an inverse strategy to change a subtraction into an addition• using inverse operations• compensation strategy• changing the order of addends to form multiples of 10• using the associative property of addition• using additive thinking	
(ii)	<ul style="list-style-type: none">• use various multiplication and division strategies for mental calculations with whole numbers where efficient for the given numbers.	<p>Strategies include:</p> <ul style="list-style-type: none">• using the commutative property of multiplication• using the associative property of multiplication• using basic multiplication facts and division facts• using doubling and repeated doubling• factorising one number• using inverse operations• using halving and repeated halving• using multiplicative thinking	
(iii)	<ul style="list-style-type: none">• use the appropriate operation to solve a range of everyday problems, using mental calculation and verifying solutions using technology		

(iv)	<ul style="list-style-type: none"> determine whether an answer is reasonable by using estimation and mental calculations 		
Module 1.3: Distance, Area and Volume			
(i)	<ul style="list-style-type: none"> identify everyday situations which involve distances, area and volume measures 		
(ii)	<ul style="list-style-type: none"> explore contexts where estimates of distance, area and volume are appropriate 	<ul style="list-style-type: none"> discuss the level of accuracy needed in practical situations 	
(iii)	<ul style="list-style-type: none"> determine an estimation of a distance, area or volume quantity using an appropriate unit or informal unit of measure 	<ul style="list-style-type: none"> identify personal benchmarks to use to estimate – a personal sense of quantity estimate the size of common units such as a square centimetre, square metre, cubic centimetre and a cubic metre common units used to make estimates in familiar situations include: 1 millimetre (1mm), 1 centimetre (1cm), 1 metre (1m), 1 kilometre (1km), 1 square centimetre (1cm²), 1 square metre (1m²), 1 cubic centimetre (1cm³), 1 cubic metre (1m³) 	
(iv)	<ul style="list-style-type: none"> solve practical problems involving cumulative distances PLO 		
(v)	<ul style="list-style-type: none"> solve practical problems involving cumulative distances PLO 		
(vi)	<ul style="list-style-type: none"> solve practical problems involving area PLO 	<ul style="list-style-type: none"> using multiplication of distances dividing composite shapes into known shapes 	
(vii)	<ul style="list-style-type: none"> solve practical problems involving volume – recall of formulas is not required PLO 		
(viii)	<ul style="list-style-type: none"> determine whether an answer for distance, area or volume is reasonable for the context of the problem 		
Module 1.4: Time			

(i)	<ul style="list-style-type: none"> identify devices commonly used to measure time 		
(ii)	<ul style="list-style-type: none"> identify commonly used time units 		
(iii)	<ul style="list-style-type: none"> choose and use the appropriate device and/or unit for measuring or stating a time in common everyday contexts PLO 		
(iv)	<ul style="list-style-type: none"> determine an estimation of time using an appropriate unit or informal unit of measure PLO 	<ul style="list-style-type: none"> identify personal benchmarks to estimate time a personal sense of duration evaluate the level of accuracy required for practical contexts 	
(v)	<ul style="list-style-type: none"> convert between units of time using the relationship between seconds and minutes; minutes and hours; hours and days; days, weeks and months 		
(vi)	<ul style="list-style-type: none"> convert between units of time using the relationship between seconds and minutes; minutes and hours; hours and days; days, weeks and months 		
(vii)	<ul style="list-style-type: none"> convert between units of time using the relationship between seconds and minutes; minutes and hours; hours and days; days, weeks and months 		
(viii)	<ul style="list-style-type: none"> compare units of time to order events 		
(ix)	<ul style="list-style-type: none"> read and use digital and analog watches, clocks and stopwatches PLO 		
(x)	<ul style="list-style-type: none"> read and use various forms of calendars 		
(xi)	<ul style="list-style-type: none"> interpret commonly used expressions of time located in various texts, media or in different countries 		
(xii)	<ul style="list-style-type: none"> solve simple problems involving elapsed time in situations involving calendars 		
(xiii)	<ul style="list-style-type: none"> solve simple problems involving time and determine whether an answer is reasonable, given the context of the problem 		

Module 1.5: Data, Graphs and Tables

(i)	<ul style="list-style-type: none">interpret information from a range of data displays from real-life contexts including lists, two-way tables, column graphs, bar graphs, side-by-side column graphs and line graphs, Venn diagrams and organisational charts		
(ii)	<ul style="list-style-type: none">identify the purpose of various representations of data used in everyday contexts and the media		
(iii)	<ul style="list-style-type: none">identify key features and symbols in tables and graphs used in everyday contexts and the media		
(iv)	<ul style="list-style-type: none">represent data in tabulated form, for example a frequency table, two-way table		
(v)	<ul style="list-style-type: none">create graphical representations of data, for example bar graphs and line graphs PLO		
(vi)	<ul style="list-style-type: none">use technology to create tabulated and graphical representations of data justifying the choice of representation		
(vii)	<ul style="list-style-type: none">analyse data, graphs and tables		
(viii)	<ul style="list-style-type: none">investigate the advantages and disadvantages of different presentations of data		
(ix)	<ul style="list-style-type: none">investigate misrepresentation of data used in the everyday contexts and the media		
(x)	<ul style="list-style-type: none">determine whether interpretations from tables and graphs are reasonable for the context		