



## St Joseph's College Gregory Terrace

## Year 7 Mathematics - 2015

Text:	
Student text in PDF:	Students can access the text via Chapter PDF's that can be accessed via the MOODLE.
Scientific calculator: Casio fx82ms	Bring to every lesson - also needed for homework

The four proficiency strands of the AUSTRALIA CURRICULUM MATHEMATICS (ACM) *Understanding, Fluency, Problem Solving and Reasoning* are an integral part of mathematics content across the three content strands: *Number and Algebra (NA), Measurement and Geometry (MG), and Statistics and Probability (SP)*. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

**At the year 7 level: (ACMNA149-158, 173-180, 280, ACMMG159-161, 163-166, 181 ACMSP167-172)**

**Understanding** includes describing patterns in uses of indices with whole numbers, recognising equivalences between fractions, decimals, percentages and ratios, plotting points on the Cartesian plane, identifying angles formed by a transversal crossing a pair of lines, and connecting the laws and properties of numbers to algebraic terms and expressions. **Fluency** includes calculating accurately with integers, representing fractions and decimals in various ways, investigating best buys, finding measures of central tendency and calculating areas of shapes and volumes of prisms. **Problem Solving** includes formulating and solving authentic problems using numbers and measurements, working with transformations and identifying symmetry, calculating angles and interpreting sets of data collected through chance experiments. **Reasoning** includes applying the number laws to calculations, applying known geometric facts to draw conclusions about shapes, applying an understanding of ratio and interpreting data displays.

**By the end of Year 7**, students solve problems involving the comparison, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two parallel lines. Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays. Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution. They assign ordered pairs to given points on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel lines. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.

**Support and Extension:****Guide to the HOTmaths integrated program**

Cambridge HOTmaths teacher and student subscriptions are available to bundle with the *ICE-EM Mathematics* textbook series.

This program integrates the content of the two resources, suggesting which HOTmaths topics, lessons, widgets, walkthroughs and HOTSheets could be used with the textbook chapters. It is provided for the use of teachers, students and parents.

A Cambridge HOTmaths student account allows students to use the full range of HOTmaths content in class or at home, and enables the teacher to use the **Progress Tracker** (a learning management system) to monitor students' work and topic quiz scores. (Parents can also track their own child's work). This makes it an ideal homework and revision resource.

A Cambridge HOTmaths teacher account allows HOTmaths to be run on one computer in a classroom, and is particularly useful when delivered via data projectors and interactive whiteboards.

HOTmaths is constantly adding new content and lessons to its database of material. This document will be updated to reflect changes, and users should regularly check HOTmaths for updates and to explore new material.

Note that the review topics in the textbooks are not aligned with specific lessons. Instead, teachers can access Topic Quizzes or Topic Scorcher for review and revision.

HOTmaths content is available from <http://www.hotmaths.com.au/>; users will need an account and login.

**SEMESTER 2 Assessment:**

Semester 2	Weighting	Timeline
Mid Term 3 Review	10%	Issued Week 4 of Term 3 - due Week 5 of Term 3
Mid Semester 2 Exam	40%	September - End of Term 3 - 1 ½ hours + 5 mins perusal
Mid Term 4 Review	10%	Issued Week 4 of Term 4 - due Week 5 of Term 4
End Semester 2 Exam	40%	November - End of Term 4 - 1 ½ hours + 5 mins perusal



Reference: ICE-EM 7 MATHEMATICS (AUSTRALIAN CURRICULUM EDITION) BOOKS 2

ACM ↔ Australia Curriculum Mathematics;	NA ↔ Number and Algebra;	MG ↔ Measurement and Geometry	SP ↔ Statistics and Probability
Term 3 week	 <b>TOPIC and Exercises</b>		ACM Content Descriptors
1 - 2	<b>11 Integers</b> 11A Negative integers (Q1a,b 2a, 3a,c 4, 7a,c,e 8a,c 9, 10) 11B Addition and subtraction of a positive integer (Q1-3a,c,e,g,i 5a,c 6) 11C Addition and subtraction of a negative integer (Q1-5a,d 7, 10, 11) 11D Multiplication involving negative integers (Q1-4a,c,e,g,i) 11E Division involving negative integers (Q1a,c,e,g,i 2a,c,e,g,i, 4a,c,e,g,i) 11F Indices and order of operations (Q1-3a,b,e 4a,c 9a,c,e,f 12)		ACMNA280
3 - 4	<b>12 Algebra and the Cartesian Plane</b> 12A Substitution with integers (Q1a-d 3a,c,e,f 8a,c,f 13a,c,d 14, 15) 12B The Cartesian plane (Q1, 2a-d, 5a,b) 12C Completing tables and plotting points (Q1a,b,c,d) 12D Finding rules (Q1a,c 2, 7, 8)		ACMNA177 ACMNA178
4 - 5	<b>Mid Term 3 Review: Issued End of Week 4 → Due Beginning of Week 5</b>		
4 - 5	<b>13 Triangles and Constructions</b> 13A Review of geometry (Q1-3a,c,e) 13B Angles in triangles (Q1, 2-3a,c,e 5-8a,c) 13C Circles and compasses (Q1, 2, 5) 13D Isosceles and equilateral triangles (Q1,2a,c,e 4-5a,c,e) 13F Quadrilaterals (Q1a,c,e 3-5a,c,e)		ACMMG163 ACMMG164 ACMMG166
6	<b>14 Negative Fractions and Decimals</b> 14A Addition and subtraction of negative fractions (Q1a 2, 3a, 4a, 5a, 6a,c,e,g 8a) 14B Multiplication and division of negative fractions (Q1a,c,e 2a,c,e 4a,b,e,g 5a,b,c 6a,g) 14C Negative decimals (Q1a,c 2a,c 3a,c 4a,c 5a,c) 14D Substitution involving negative fractions and decimals (Q1a,c,e 2a,d,f 4a,c,e 11a,e,g)		ACMNA153 ACMNA154 ACMNA157
7 - 8	<b>15 Percentages and Ratios</b> 15A Percentages, fractions and decimals (Q1a,d,e 2a,c,e 3a,c,e 4a,c,d,f,j 5a,b,e 6a,c,e,f 7a, 8) 15B One quantity as a percentage of another (Q1a,b 2a,b,d,e 3a) 15C Percentage of a quantity (Q1 2a,d,h 5, 6) 15D Ratios (Q1, 4a,b,c,e,f 5, 10) 15E Solving problems with ratios (Q1a,c,e 3, 5, 6, 10) 15F Best buys (Q1, 3, 5)		ACMNA157 ACMNA158 ACMNA173 ACMNA174
9	<b>Revision Ch 11, 12, 13, 14 and 15</b>		
10	<b>Examination (1½ hours + 5 minutes perusal)</b>		



Reference: ICE-EM 7 MATHEMATICS (AUSTRALIAN CURRICULUM EDITION) BOOKS 1 &amp; 2

ACM ↔ Australia Curriculum Mathematics;	NA ↔ Number and Algebra;	MG ↔ Measurement and Geometry	SP ↔ Statistics and Probability
---	--------------------------	-------------------------------	---------------------------------

Term 4 week	TOPIC and Exercises	ACM Content Descriptors
1	<b>17 Probability</b> 17A An introduction to probability (Q1, 2) 17B Experiments and counting (Q1, 4, 7, 8, 10, 12, 15, 18)	ACMSP167 ACMSP168
1 - 3	<b>18 Transformations and Symmetry</b> 18A Translations (Q1,2a,b,c 3) 18B Rotations (Q1b,c 2a,b,c,d) 18C Reflections (Q1a-m) 18D Combinations of transformations (Q1a,b 2a, 3a, 4a,b 5a,b) 18E Transformations in the Cartesian plane (Q1-3a,b,c 5a,b,c 8a,b,c 11a,b ) 18F Symmetry (Q1, 2) 18G Regular polygons (Q1)	ACMMG181
4 - 5	<b>Mid Term 4 Review: Issued End of Week 4 → Due Beginning of Week 5</b>	
4 - 6	<b>16 Solving Equations</b> 16A An introduction to equations (Q1,2a,b,d,g,k 3a,b,c,e-4, 6) 16B Equivalent equations (Q1-2a,c,e,g,i 3a,c,e-4a,c,e,g,i 5-6a,c,e,g) 16C Solving equations involving more than one step (Q1-2a,c,e,g,i 3a,c,e-4a,c,e,g,i 5a,c,e) 16D Equations with negative solutions (Q1-4a,b,c,d) 16E Expanding brackets and solving equations (Q1-3a,b,c,d 4a,b) 16F Collecting like terms and solving equations (Q1-3a,c,e,g,i 4a,b,c) 16G Equations with pronumerals on both sides (Q1-3a,b,c,d) 16H Solving problems using equations (Q1a,b,c,d 2, 4, 5, 10-12)	ACMNA179
6 - 7	<b>19 Graphs and Tables</b> 19A Reading tables (Q1, 2, 4) 19B The pictogram (Q1, 3) 19C Column graphs (Q1, 2, 4) 19D Divided bar charts and pie charts (Q1, 3, 4, 6, 8) 19E Line graphs (Q1, 3, 6) 19F Applications of the line graph (Q1-4)	ACMNA180
7 - 8	<b>20 Statistics</b> 20A Data and dot plots (Q1, 2) 20B The mode (Q1, 2) 20C Stem-and-leaf plots (Q1-3) 20D Median, mean and range (Q1, 4, 6)	ACMSP169 ACMSP170 ACMSP171 ACMSP172
8	<b>Revision Ch 17, 18, 16, 19 and 20</b>	
8	<b>Examination (1½ hours + 5 minutes perusal)</b>	



# ICE-EM MATHEMATICS

Australian Curriculum Edition

Year  
**7**

## Proficiency Strands and Criterion:

CRITERION	ACM PROFICIENCY STRANDS	DESCRIPTORS				
		A	B	C	D	E
		<b>The student work demonstrates evidence of:</b>				
Knowledge and Procedures	Understanding	Comprehensive knowledge and understanding of concepts, facts and procedures	Thorough knowledge and understanding of concepts, facts and procedures	Satisfactory knowledge and understanding of concepts, facts and procedures	Variable knowledge and understanding of concepts, facts and procedures	Rudimentary knowledge and understanding of concepts, facts and procedures
	Fluency					
Modelling and Problem Solving	Problem Solving	Insightful application of mathematical processes to generate solutions and check for reasonableness	Proficient application of mathematical processes to generate solutions and check for reasonableness	Competent application of mathematical processes to generate solutions and check for reasonableness	Variable application of mathematical processes to generate solutions and check for reasonableness	Minimal application of mathematical processes to generate solutions and check for reasonableness
Communication and Justification	Reasoning	Clear and accurate communication of ideas, explanations and findings using mathematical representations, language and technologies	Coherent and accurate communication of ideas, explanations and findings using mathematical representations, language and technologies	Sound communication of ideas, explanations and findings using mathematical representations, language and technologies	Disjointed communication of ideas, explanations and findings using representations, language and technologies	Unclear communication of ideas, explanations and findings using representations, language and technologies
		Perceptive reflection on thinking and reasoning, the contribution of mathematics and learning	Informed reflection on thinking and reasoning, the contribution of mathematics and learning	Relevant reflection on thinking and reasoning, the contribution of mathematics and learning	Superficial reflection on thinking and reasoning, the contribution of mathematics and learning	Cursory reflection on thinking and reasoning, the contribution of mathematics and learning

### Criterion 1 - Knowledge and Procedures:

A+ $\geq$ 98%	A $\geq$ 88%	A- $\geq$ 85%
B+ $\geq$ 83%	B $\geq$ 73%	B- $\geq$ 70%
C+ $\geq$ 68%	C $\geq$ 53%	C- $\geq$ 50%
D+ $\geq$ 48%	D $\geq$ 28%	D- $\geq$ 25%
E+ $\geq$ 23%	E $\geq$ 10%	E- $<$ 10%

### Criterion 2 - Modelling and Problem Solving:

A+ $\geq$ 95%	A $\geq$ 73%	A- $\geq$ 70%
B+ $\geq$ 68%	B $\geq$ 53%	B- $\geq$ 50%
C+ $\geq$ 48%	C $\geq$ 23%	C- $\geq$ 20%
D+ $\geq$ 18%	D $\geq$ 8%	D- $\geq$ 5%
E+ $\geq$ 3 %	E $\geq$ 2 %	E- $\geq$ 0-1 %

### Global result - Minimum standards:

A	A in any 2 criteria and a B in the third
B	B in any 2 criteria and a C in the third
C	C in Knowledge and Procedures, 1 other C and a D
D	D in Knowledge and Procedures and 1 other D
E	E in Knowledge and Procedures

The semester results will be refined with '+' and '-' reflecting the combined effect of all 3 criteria

**Year 7 Australia Curriculum Content Descriptors**

<b>Number and Algebra</b>	(ACMNA149) Investigate index notation and represent whole numbers as products of powers of prime numbers
	(ACMNA150) Investigate and use square roots of perfect square numbers
	(ACMNA151) Apply the associative, commutative and distributive laws to aid mental and written computation
	(ACMNA152) Compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line
	(ACMNA153) Solve problems involving addition and subtraction of fractions, including those with unrelated denominators
	(ACMNA154) Multiply and divide fractions and decimals using efficient written strategies and digital technologies
	(ACMNA155) Express one quantity as a fraction of another, with and without the use of digital technologies
	(ACMNA156) Round decimals to a specified number of decimal places
	(ACMNA157) Connect fractions, decimals and percentages and carry out simple conversions
	(ACMNA158) Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies
	(ACMNA173) Recognise and solve problems involving simple ratios
	(ACMNA174) Investigate and calculate 'best buys', with and without digital technologies
	(ACMNA175) Introduce the concept of variables as a way of representing numbers using letters
	(ACMNA176) Create algebraic expressions and evaluate them by substituting a given value for each variable
	(ACMNA177) Extend and apply the laws and properties of arithmetic to algebraic terms and expressions
	(ACMNA178) Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point
	(ACMNA179) Solve simple linear equations
	(ACMNA180) Investigate, interpret and analyse graphs from authentic data
	(ACMNA280) Compare, order, add and subtract integers
<b>Measurement and Geometry</b>	(ACMMG159) Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving
	(ACMMG160) Calculate volumes of rectangular prisms
	(ACMMG161) Draw different views of prisms and solids formed from combinations of prisms
	(ACMMG163) Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal
	(ACMMG164) Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning
	(ACMMG166) Demonstrate that the angle sum of a triangle is $180^\circ$ and use this to find the angle sum of a quadrilateral
	(ACMMG181) Describe translations, reflections in an axis, and rotations of multiples of $90^\circ$ on the Cartesian plane using coordinates. Identify line and rotational symmetries
<b>Statistics and Probability</b>	(ACMSP167) Construct sample spaces for single-step experiments with equally likely outcomes
	(ACMSP168) Assign probabilities to the outcomes of events and determine probabilities for events
	(ACMSP169) Identify and investigate issues involving numerical data collected from primary and secondary sources
	(ACMSP170) Construct and compare a range of data displays including stem-and-leaf plots and dot plots
	(ACMSP171) Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data
	(ACMSP172) Describe and interpret data displays using median, mean and range