St Joseph's College Gregory Terrace

Year 8 Mathematics – 2015

Text:	ICE-EM MATHEMATICS Australian Curriculum Edition
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 8 level: (ACMNA182-184, 186-194, ACMMG195-202, ACMSP204-207, 292-293)
Understanding includes describing patterns in uses of indices and repeating decimals, identifying commonalities between operations with algebra and arithmetic, connecting rules of relations and functions and their graphs, explaining the function of statistical measures, and contrasting measurements of perimeter and area. *Fluency* includes calculating accurately with simple decimals, indices and integers, recognising equivalence of common decimals and fractions including repeating decimals, factorising and simplifying basic algebraic expressions, evaluating perimeters, areas and volumes of common shapes, and calculating the mean and median of small sets of data. *Problem Solving* includes formulating and modelling, with comparisons of ratios, profit and loss, authentic situations involving areas and perimeters of common shapes and analysing and interpreting data using two-way tables. *Reasoning* includes justifying the result of a calculation or estimation as reasonable, explaining formal and intuitive use of ratios for comparing rates and prices, deriving one probability from its complement, using congruence to deduce properties of triangles, and making inferences about data.

By the end of Year 8, students solve everyday problems involving rates, ratios and percentages. They recognise index laws and apply them to whole numbers. They describe rational and irrational numbers. Students solve problems involving profit and loss. They make connections between expanding and factorising algebraic expressions. Students solve problems relating to the volume of prisms. They make sense of time duration in real applications. They identify conditions for the congruence of triangles and deduce the properties of quadrilaterals. Students model authentic situations with two-way tables and Venn diagrams. They choose appropriate language to describe events and experiments. They explain issues related to the collection of data and the effect of outliers on means and medians in that data. Students use efficient mental and written strategies to carry out the four operations with integers. They simplify a variety of algebraic expressions. They solve linear equations and graph linear relationships on the Cartesian plane. Students convert between units of measurement for area and volume. They perform calculations to determine perimeter and area of parallelograms, rhombuses and kites. They name the features of circles and calculate the areas and circumferences of circles. Students determine complementary events and calculate the sum of probabilities.

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

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Note: Students are away on camp throughout term 3 – this schedule is designed to assist students catch up on work that they have missed during their time at Maroon.

Term 3 week	TOPIC and Exercises	ICE-EM MATHEMATICS Australian Curriculum Edition	ACM Content Descriptors
1 – 2	**10 Rates and Ratio** 10A Review of the unitary method **(Q1-3a,c,e 4a,6b,7a,8)** 10B Solving problems using the unitary method **(Q1-3a,c,e 4b,d 6b,7a)** 10C Speed **(Q1-3, 6, 12, 14)** 10D Ratios **(Q1, 3, 4, 5, 6, 9a,b,e,f 10 12 13a,c,e,f,g 14 17c 21)** 10E Using ratios in problems **(Q1, 2, 6, 9, 18, 19)** 10F Scale drawings **(Q1-4a,c,d 9f 12a,b 13a)**		ACMNA 188
3 – 4	**11 Algebra (Part 2)** 11A Expanding brackets and collecting like terms **(Q1a,d,g,i,k 2a,b,d,e,m 3a,b 4a,b,d)** 11B Addition and subtraction of algebraic fractions **(Q1a,b,d,e,g,o)** 11C Solving equations **(Q1c,d,e,f,i,j,l 2a,b,d,g,k,l 3a 4a,c,f,i)** 11D Problem-solving with equations **(Q1a,e 2a,b 3,4,5,9,10)**		ACMNA 190 ACMNA 192
4 – 5	**Mid Term 3 Review: Issued End of Week 4 → Due Beginning of Week 5**		
4 – 5	**12 Congruent Triangles** 12A Congruence of figures in the plane **(Q1,2)** 12B Congruent triangles **(Q1a,c,d)** 12C Congruent triangles: the SSS and AAS tests **(Q4a,d,e 5b 6a,b)** 12D Congruent triangles: the SAS and RHS tests **(Q3a,d,f 4a,b 5a,b,c)** 12F Congruence and special triangles **(Q1a-j)**		ACMMG 200 ACMMG 201
6	**13 Congruence and special quadrilaterals** 13A Parallelograms and their properties **(Q5a,b,c,e 6a)** 13B Rhombuses and their properties **(Q2a,b,c,e 3a)** 13C Rectangles and squares and their properties **(Q1a,c,e 2a, 8)**		ACMMG 202
7 – 8	**15 Areas, Volume and Time** 15A Review of area and length **(Q1a,b,d,e 2a,b 5a,b,d 7,10a,f)** 15B Areas of special quadrilaterals **(Q1, 2b,c,g,h 3c, 4a, 6a, 9, 13b)** 15C Volume of a rectangular prism **(Q2a,b,d, 3, 4a,c, 5, 7)** 15D Volumes of other prisms **(Q1a,b,d, 2, 8a,b)** 15F Surface area of a prism **(Q1a,d 2a,b 3a 5)** 15G Conversion of units **(Q1-3a,b 5, 14a,b 15, 18)** 15H Time **(Q1a,b 5a,c,e 7, 8)**		ACMMG 195 ACMMG 196 ACMMG 198 ACMMG 199
9	**Revision Ch 10, 11, 12 ,13 and 15**		
10	**Examination (1½ hours + 5 minutes perusal)**		

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Term 4 week	TOPIC and Exercises ICE-EM MATHEMATICS Australian Curriculum Edition 8 Year	ACM Content Descriptors
1 - 2	**14 Circles** 14A Features of the circle **(Q1-2a,b 3, 4a)** 14B Circumference of a circle **(Q3-4a, 8a, 11, 13, 14, 15-16a, 18c)** 14C Area of a circle **(Q2-3a, 7a, 10, 12, 15a, 17a, 20)** 14D Areas of composite figures **(Q1-3, 6,7,10, 12a)**	ACMMG197
2 - 3	**16 Probability** 16A An introduction to probability **(Q4,8,12,13,23,24,26,27)** 16B 'Or' and 'and' **(Q1, 4, 5)** 16C Two-way tables **(Q1,5,9)** 16D Further uses of Venn diagrams **(Q1,3,5)**	ACMSP 204 ACMSP 205 ACMSP 292
4 - 5	Mid Term 4 Review: Issued End of Week 4 → Due Beginning of Week 5	
3 - 5	**17 Formulas and Factorisation** 17A Formulas **(Q1, 2a,b 3a,d 6ai, 8a, 10, 12a)** 17B Expansion and factorisation **(Q1-5a,b,c,g 6a)** 17C Binomial products **(Q1a,I,k,l,m,q 2b, 3a,d, 4a,f,i)**	ACMNA191 ACMNA194
5 - 7	**18 Graphing straight lines** 18A The Cartesian plane **(Q1a,d,f)** 18B Straight-line graphs that pass through the origin **(Q1b, 2a)** 18C Straight-line graphs that do not pass through the origin **(Q1ai,iv 2aii, v)** 18D Points and lines **(Q1a,b 5a,b 7c,d 10, 11, 12)** 18E The y-intercept and the gradient of a line **(Q1-2a,c,d 3b, 6b)** 18F More on gradients **(Q1-2a,b,d 3a,c 5,6)** 18G Applications to constant rate problems **(Q1,2)**	ACMNA 193 ACMNA 194
7-8	**19 Statistics** 19A Comparing means and medians **(Q2, 4, 7, 10)** 19B Sampling data **(Identify processes in sampling)** 19C Variation of means and proportions **(Q1, 7)**	ACMSP206 ACMSP207 ACMSP293
8	Revision Ch 14, 16, 17, 18 and 19	
8	Examination (1½ hours + 5 minutes perusal)	

Proficiency Strands and Criterion:

CRITERION	ACM PROFICIENCY STRANDS	DESCRIPTORS				
		A	B	C	D	E
		The student work demonstrates evidence of:				
Knowledge and Procedures	**Understanding** / **Fluency**	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
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 8 Australia Curriculum Content Descriptors

Number and Algebra

(ACMNA182) Use index notation with numbers to establish the index laws with positive integral indices and the zero index

(ACMNA183) Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies

(ACMNA184) Investigate terminating and recurring decimals

(ACMNA186) Investigate the concept of irrational numbers, including π

(ACMNA187) Solve problems involving the use of percentages, including percentage increases and decreases, with and without digital technologies

(ACMNA188) Solve a range of problems involving rates and ratios, with and without digital technologies

(ACMNA189) Solve problems involving profit and loss, with and without digital technologies

(ACMNA190) Extend and apply the distributive law to the expansion of algebraic expressions

(ACMNA191) Factorise algebraic expressions by identifying numerical factors

(ACMNA192) Simplify algebraic expressions involving the four operations

(ACMNA193) Plot linear relationships on the Cartesian plane with and without the use of digital technologies

(ACMNA194) Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution

Measurement and Geometry

(ACMMG195) Choose appropriate units of measurement for area and volume and convert from one unit to another

(ACMMG196) Find perimeters and areas of parallelograms, rhombuses and kites

(ACMMG197) Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area

(ACMMG198) Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume

(ACMMG199) Solve problems involving duration, including using 12- and 24-hour time within a single time zone

(ACMMG200) Define congruence of plane shapes using transformations

(ACMMG201) Develop the conditions for congruence of triangles

(ACMMG202) Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning

(ACMMG222) Investigate Pythagoras' Theorem and its application to solving simple problems involving right-angled triangles

Statistics and Probability

(ACMSP204) Identify complementary events and use the sum of probabilities to solve problems

(ACMSP205) Describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and'

(ACMSP292) Represent events in two-way tables and Venn diagrams and solve related problems

(ACMSP284) Investigate techniques for collecting data, including census and sampling

(ACMSP206) Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes

(ACMSP293) Explore the variation of means and proportions in random samples drawn from the same population

(ACMSP207) Investigate the effect of individual data values, including outliers, on the mean and median