Lesson Plans

Year 7 Mathematics   TERM 1

Some general points about the following lesson plans:

★ The lesson plans outline only one way of sequencing the learning material in each chapter of the textbook.

★ The content and sequence will obviously vary from class to class (The following guide is ambitious in many instances).

★ All activities and investigations in each chapter have been deliberately designed to support the National Curriculum content whilst keeping in mind the development and reinforcement of skills required in the study of mathematics in Year 11/12.

★ The length of lessons vary from school to school and even within schools. The following guide is based on 35/40 min lessons because it was reasoned that adjustment to 60/75/90 mins lessons would be easier than reducing lesson plans.

★ Students may be challenged further by completing each chapter Task, Competition Questions, and by finding and entering any of the many competitions, challenges, projects etc that may be found on the Internet. Such students may benefit by doing an Internet search early in the year and planning entries before they close.

Assessment

A task	7th week of Term
Mental computation	Last week of Term
End of Term Test	Last week of Term

Summary of Term 1 Lessons (10 weeks)

Chapter 1	Number 1	Number & Algebra - Real Numbers	2 weeks
Chapter 2	Area	Measurement & Geometry - Units	2 weeks
Chapter 3	Probability	Statistics and Probability - Chance	2 weeks
Chapter 4	Money	Number and Algebra - Money	2 weeks
Chapter 5	Review	All of above	2 weeks

Note: The workprogram contains a detailed mapping of curriculum content.

Year 7 Level Description

The proficiency strands Understanding, Fluency, Problem Solving and Reasoning are an integral part of mathematics content across the three content strands: Number and Algebra, Measurement and Geometry, and Statistics and Probability. 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 this year level:
*   **Understanding** includes describing patterns in uses of indices with whole numbers, recognising commonalities between fractions, decimals, percentages and ratios, plotting points on the Cartesian plane, identifying angles formed by a transversal crossing a pair of parallel 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, evaluating 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, creating 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

Year 7 Content Description

Chapter 1   Number 1   (Number & Algebra ➡ Real Numbers)
★   Express one quantity as a fraction of another.
★   Connect fractions, decimals and percentages and carry out simple conversions.
★   Find percentages of quantities and express one quantity as a percentage of another.
★   Justify choice of written, mental or calculator strategies for solving specific problems including those involving large numbers.

Chapter 2   Area   (Measurement & Geometry ➡ Units)
★   Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving.
★   Use area formulas for rectangles and triangles to solve problems involving areas of surfaces.

Chapter 3   Probability   (Statistics and Probability ➡ Chance)
★   Discuss the meaning of probability terminology (for example probability, sample space, favourable outcomes, trial, chance events and experiments).
★   Construct sample spaces for single-step experiments with equally likely outcomes
★   Express probabilities in common and decimal fractional and percentage forms.
★   Understand the advantages and limitations of calculating theoretical probabilities.

Chapter 4   Money   (Number and Algebra ➡ Money)
★   Find percentages of quantities and express one quantity as a percentage of another.
★   Use authentic problems to express quantities as percentages of other amounts.
★   Apply the unitary method to identify 'best buys' situations, such as comparing the cost per 100g.

Chapter 5   Review
  ★   Review of all of above.

Chapter 1   Number 1   (Number & Algebra ➡ Real Numbers)

★ Express one quantity as a fraction of another.
★ Connect fractions, decimals and percentages and carry out simple conversions.
★ Find percentages of quantities and express one quantity as a percentage of another.
★ Justify choice of written, mental or calculator strategies for solving specific problems including those involving large numbers.

Lesson	Method	Resources
1	☐ General (covering book, ruling pages, paste study guide etc.) ☐ Purpose of chapter ☐ Exercise 1.1 p2 (Model solutions for students) ☐ HW: Read and practice the Sweet Trick on p13	
2	☐ Exercise 1.2 p3 ☐ Exercise 1.3 p4 (Model solutions) ☐ Some students demonstrate the Sweet Trick p13 ☐ HW: Complete Exercises and demonstrate Sweet Trick at home/lodgings	
3	☐ Discussion about Sweet Trick - how to improve presentation ☐ Exercise 1.4 p5 ☐ Exercise 1.5 p6 (Model solutions) ☐ HW: Complete Exercises	
4	☐ Short mental test on simple fractions/percentages - repeat until efficient ☐ Exercise 1.6 p7 (Model solutions) ☐ Investigation 1.1 p12 (Students may need introduction and further support) ☐ HW: Complete exercise and Investigations 1.1, 1.2	Calculators
5	☐ Discussion of why employers are adamant that employees have adequate mental computation skills - also very useful revision technique ☐ Mental computation Exercise 1.9 p9 ☐ Exercise 1.8 p8 (Model solutions) ☐ HW: Complete Exercise	
6	☐ Mental computation Exercise 1.10 p9 Group work working on a choice/combination of: ☐ A couple of puzzles p13 ☐ Investigation 1.3 p12 ☐ A game p13 - (play the game a couple of times, try to determine a strategy) ☐ HW: Competition Questions 1-3 p11	
7	☐ Mental computation Exercise 1.11 p9 Group work working on a directed/choice/combination of: ☐ Investigation 1.2, 1.3 p12 ☐ A game p13 - (play the game a couple of times, try to determine a strategy) ☐ Technology 1.1, 1.2, 1.3 p14 ☐ HW: A couple of puzzles p13	
8	☐ NAPLAN Questions p10 (Model solutions) ☐ Competition Questions p11 (Model solutions) ☐ HW: Complete NAPLAN Questions	
9	☐ Chapter Review 1 p15 ☐ HW: Complete Chapter Review	
10	☐ Chapter Review 2 p16 ☐ HW: Complete Chapter Review	

Chapter 2   Area   (Measurement & Geometry ➡ Units)

★ Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving.

★ Use area formulas for rectangles and triangles to solve problems involving areas of surfaces.

Lesson	Method	Resources
1	☐ Purpose of chapter ☐ Exercise 2.1 p18 ☐ Exercise 2.2 p19 (Model solutions for students) ☐ HW: Read and practice the Sweet Trick on p30	
2	☐ Exercises 2.3 p20 (Activity at top of page first) ☐ Some students demonstrate the Sweet Trick p30 ☐ HW: Complete Exercise and demonstrate Sweet Trick at home/lodgings	Scissors rulers
3	☐ Discussion about Sweet Trick - how to improve presentation ☐ Exercise 2.4 p21 (Model solutions) ☐ Exercise 2.5 p22 (Model solutions) ☐ HW: Complete Exercises	
4	☐ Investigation 2.1 p28 ☐ Exercise 2.6 p23 (Model solutions) ☐ HW: Complete exercise	
5	☐ Mental computation Exercise 2.18 p25 ☐ Revisit discussion of why employers are adamant that employees have adequate mental computation skills - also very useful revision technique ☐ Exercise 2.7 p24 ☐ HW: Competition Questions 1-3 p27	
6	☐ Mental computation Exercise 2.9 p25 Group work working on directed/choice/combination of: ☐ Investigations 2.2, 2.3, 2.4, 2.5, 2.6 p28 ☐ A game p30 ☐ Technology 2.1, 2.2 p29 ☐ HW: A couple of puzzles p30	graph paper Internet computers
7	☐ Mental computation Exercise 2.10 p25 Group work working on directed/choice/combination of: ☐ Investigations 2.2, 2.3, 2.4, 2.5, 2.6 p28 ☐ A game p30 ☐ Technology 2.1, 2.2 p29	Calculators Computers
8	☐ NAPLAN Questions p26 ☐ Competition Questions 4-9 p27 ☐ HW: Complete NAPLAN Questions	Calculators Computers
9	☐ Chapter Review 1 p31 ☐ HW: Complete Chapter Review	
10	☐ Chapter Review 2 p32 ☐ HW: Complete Chapter Review	

Chapter 3   Probability (Statistics and Probability ➡ Chance)

★ Discuss the meaning of probability terminology (for example probability, sample space, favourable outcomes, trial, chance events and experiments).
★ Construct sample spaces for single-step experiments with equally likely outcomes
★ Express probabilities in common and decimal fractional and percentage forms.
★ Understand the advantages and limitations of calculating theoretical probabilities.

Lesson	Method	Resources
1	☐ Purpose of chapter. Importance of algebra for solving millions of problems ☐ Exercise 3.1 p34 ☐ Exercise 3.2 p35 (Model solutions for students) ☐ HW: Read and practice the Sweet Trick on p46 and complete exercises	
2	☐ Exercises 3.3 p36 ☐ Some students demonstrate the Sweet Trick p46 ☐ HW: Complete Exercise and demonstrate Sweet Trick at home/lodgings	
3	☐ Discussion about Sweet Trick - how to improve presentation ☐ Exercise 3.4 1-3 p38 ☐ HW: Competition Questions 1-2 p43	coins
4	☐ Exercise 3.4 4-6 p39 ☐ HW: Competition Questions 3-5 p43	dice
5	☐ Mental computation Exercise 3.6 p41 ☐ Exercise 3.5 p40 (Model solutions) ☐ HW: Competition Questions 6-8 p43	dice
6	☐ Mental computation Exercise 3.7 p41 ☐ NAPLAN Questions p42 (Model solutions) ☐ HW: Complete NAPLAN Questions	
7	☐ Mental computation Exercise 3.8 p41 Group work working on a directed/choice/combination of: ☐ Investigations 3.1, 3.2, 3.3, 3.4 p44 ☐ Technology 3.1, 3.2, 3.3 p45 ☐ A Game p46 ☐ HW: A couple of puzzles 1-2 p46	bottletops matchboxes scissors protractors rulers computers
8	Group work working on a directed/choice/combination of: ☐ Investigations 3.1, 3.2, 3.3, 3.4 p44 ☐ Technology 3.1, 3.2, 3.3 p45 ☐ A Game p46 ☐ HW: A couple of puzzles 2-4 p46	bottletops matchboxes scissors protractors rulers computers
9	☐ Chapter Review 1 p47 ☐ HW: Complete Chapter Review and a couple of puzzles p48	
10	☐ Chapter Review 2 p48 ☐ HW: Complete Chapter Review	

Chapter 4   Money   (Number and Algebra ➤ Money)

★ Find percentages of quantities and express one quantity as a percentage of another.
★ Use authentic problems to express quantities as percentages of other amounts.
★ Apply the unitary method to identify 'best buys' situations, such as comparing the cost per 100g.

Lesson	Method	Resources
1	☐ Purpose of chapter ☐ Exercise 4.1 p50 (Model solutions for students) ☐ HW: Read and practice the Sweet Trick on p60, complete exercise	
2	☐ Exercise 4.2 p51 (Model solutions) ☐ Some students demonstrate the Sweet Trick p60 ☐ HW: Complete exercise and demonstrate Sweet Trick at home/lodgings	
3	☐ Exercise 4.3 p52 (Model solutions) ☐ Investigation 4.1 p58 ☐ HW: Competition Questions 1-5 p57	
4	☐ Exercise 4.4 p53 (Model solutions) ☐ Competition Questions 6-10 p57 (Model solutions) ☐ HW: Complete above exercises	
5	☐ Mental computation Exercise 4.6 p55 ☐ Exercise 4.5 p54 (Model solutions) ☐ Competition Questions 11-12 p57 (Model solutions) ☐ HW: Complete above exercises	
6	☐ Mental computation Exercise 4.7 p55 ☐ NAPLAN Questions p56 ☐ HW: Complete above exercises	
7	☐ Mental computation Exercise 4.8 p55 Group work working on a directedchoice/combination of: ☐ Investigations 4.2, 4.3, 4.4 p58 ☐ Technology 4.1, 4.2, 4.3 p59 ☐ A Game p60 ☐ HW: A couple of puzzles 1-3 p60	calculators Internet
8	Group work working on a directedchoice/combination of: ☐ Investigations 4.2, 4.3, 4.4 p58 ☐ Technology 4.1, 4.2, 4.3 p59 ☐ A Game p60 ☐ HW: A couple of puzzles 1-3 p60	calculators Internet
9	☐ Chapter Review 1 p61 ☐ HW: Complete Chapter Review	
10	☐ Chapter Review 2 p62 ☐ HW: Complete Chapter Review	

A Task

Work on one of the four tasks at the beginning of each chapter.
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Lesson	Method	Resources
1-5	☐ Setup ☐ Decide whether tasks completed individually, groups of two, three, or four ☐ Decide which tasks are assigned to individuals/groups ☐ Decide how tasks are to be presented: Oral presentation, poster presentation (on classroom wall), power point presentation etc. ☐ If the presentation will take class time then decide when. ☐ Each lesson may be started with a mental computation or a summary of what is expected from the work on the tasks.	Textbook Assesssment instruments

Chapter 5   Review

Chapter 1   Number 1   (Number & Algebra ➡ Real Numbers)
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Chapter 4   Money   (Number and Algebra ➡ Money)
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Lesson	Method	Resources
1-10	☐ Purpose of Review ☐ Review 1 p64 ☐ Review 2 p67 ☐ Repetition of above until mastery? ☐ Sample end of term papers (www.drdwyer.com.au) ☐ Assessment	Textbook Assesssment instruments