Lesson Plans

Year 10 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	Algebra 1	Number & Algebra - Patterns & Algebra	3 weeks
Chapter 2	Linear Eqns	Number & Algebra - Linear & Non-linear	3 weeks
Chapter 3	Measurement & Geometry	Measurement & Geometry - Units	2 weeks
Chapter 5	Review	All of above	2 weeks

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

Year 10 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 applying the four operations to algebraic fractions, finding unknowns in formulas after substitution, making the connection between equations of relations and their graphs, comparing simple and compound interest in financial contexts and determining probabilities of two and three step experiments

- **Fluency** includes factorising and expanding algebraic expressions, using a range of strategies to solve equations and using calculations to investigate ing the shape of data sets

- **Problem Solving** includes calculating the surface area and volume of a diverse range of prisms to solve practical problems, finding unknown lengths and angles using applications of trigonometry, using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities, and investigating independence of events

- **Reasoning** includes formulating geometric proofs involving congruence and similarity, interpreting and evaluating media statements and interpreting and comparing data sets

Year10A Content Description

Chapter 1   Algebra 1   (Number & Algebra ➡ Patterns and Algebra)

- ★ Factorise algebraic expressions by taking out a common algebraic factor.
- ★ Simplify algebraic products and quotients using index laws.
- ★ Apply the four operations to simple algebraic fractions with numerical denominators.

Chapter 2   Linear Equations   (Number & Algebra ➡ Linear & Non-linear)

- ★ Solve problems involving linear equations, including those derived from formulas.
- ★ Solve linear inequalities and graph their solutions on a number line.
- ★ Solve linear simultaneous equations, using algebraic and graphical techniques including using digital technology.

Chapter 3   Area & Volume   (Measurement & Geometry ➡ Using Units of Measurement)

- ★ Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids.

Chapter 5   Review

- ★ Review of all of above.

Chapter 1   Algebra 1   (Number & Algebra ➡ Patterns & Algebra)

★ Factorise algebraic expressions by taking out a common algebraic factor.
★ Simplify algebraic products and quotients using index laws.
★ Apply the four operations to simple algebraic fractions with numerical denominators.

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 (Model solutions) ☐ Some students demonstrate the Sweet Trick p13 ☐ HW: Complete Exercise and demonstrate Sweet Trick at home/lodgings	
3	☐ Discussion about Sweet Trick - how to improve presentation ☐ Exercise 1.3 p4 (Model solutions) ☐ Technology 1.2 p14 ☐ HW: Complete Exercise	
4	☐ Exercise 1.4 p5 ☐ Technology 1.2 p14 ☐ HW: Complete Exercise	
5	☐ Exercise 1.5 p6 (Model solutions) ☐ Investigation 1.1 p12 ☐ HW: Complete Exercises	
6	☐ Exercise 1.6 p7 (Model solutions) ☐ Investigation 1.2 p12 ☐ HW: Complete exercise and Investigations 1.1, 1.2	Calculators
7	☐ Discussion of why employers are adamant that employees have adequate mental computation skills - also very useful revision technique ☐ Mental computation Exercise 1.9 p10 ☐ Exercise 1.7 p8 (Model solutions) ☐ HW: Complete Exercise	
8	☐ Mental computation Exercise 1.10 p10 ☐ Exercise 1.8 p9 (Model solutions) ☐ Technology 1.4 p14 ☐ HW: Complete Exercise	Internet
9	☐ Mental computation Exercise 1.11 p10 Group work working on a directed/choice/combination of: ☐ A couple of puzzles p13 ☐ Investigations 1.3, 1.4 p12 ☐ A game p13 ☐ HW: Competition Questions 1-2 p11	
10	Group work working on a directed/choice/combination of: ☐ A couple of puzzles p13 ☐ Investigations 1.3, 1.4 p12 ☐ A game p13 ☐ HW: Competition Questions 3-4 p11	
11	Group work working on a directed/choice/combination of: ☐ A couple of puzzles p13 ☐ Investigations 1.3, 1.4 p12 ☐ A game p13	
12	☐ Chapter Review 1 p15	
13	☐ Chapter Review 1 p15 ☐ HW: Complete Chapter Review	
14	☐ Chapter Review 2 p16	
15	☐ Chapter Review 2 p16 ☐ HW: Complete Chapter Review	

Chapter 2   Linear Equations   (Number & Algebra ➡ Linear & Non-linear)

- ★ Solve problems involving linear equations, including those derived from formulas.
- ★ Solve linear inequalities and graph their solutions on a number line.
- ★ Solve linear simultaneous equations, using algebraic and graphical techniques including using digital technology.

Lesson	Method	Resources
1	☐ Purpose of chapter ☐ Exercise 2.1 p18 (Model solutions for students) ☐ HW: Read and practice the Sweet Trick on p28	
2	☐ Exercise 2.2 p19 (Model solutions for students) ☐ Some students demonstrate the Sweet Trick p28 ☐ HW: Complete exercise and demonstrate Sweet Trick at home/lodgings	
3	☐ Discussion about Sweet Trick - how to improve presentation ☐ Exercise 2.3 p20 ☐ HW: Complete Exercise	
4	☐ Exercise 2.4 p21 ☐ HW: Complete Exercise	
5	☐ Exercise 2.5 p22 (Model solutions) ☐ HW: Complete Exercise	Graph paper
6	☐ Exercise 2.6 p22 (Model solutions) ☐ HW: Complete Exercise	Graph paper
7	☐ Exercise 2.7 p24 (Model solutions) ☐ HW: Complete exercise	
8	☐ Exercise 2.8 p25 (Model solutions) ☐ HW: Complete exercise	
9	☐ Mental computation Exercise 2.9 p26 ☐ Revisit discussion of why employers are adamant that employees have adequate mental computation skills - also very useful revision technique ☐ Investigation 2.1 p29 ☐ HW: Competition Questions 1-3 p27	Scales
10	☐ Mental computation Exercise 2.10 p26 Group work working on directed/choice/combination of: ☐ A couple of puzzles p28 ☐ A game p28 ☐ Technology 2.1, 2.2 p30 ☐ Investigation 2.2 p29 ☐ HW: Competition questions 4-5 p27	Internet
11	☐ Mental computation Exercise 2.11 p26 Group work working on directed/choice/combination of: ☐ A couple of puzzles p28 ☐ A game p28 ☐ Technology 2.1, 2.2 p30 ☐ Investigation 2.2 p29 ☐ Competition question 6 p27	Internet
12	☐ Chapter Review 1 p31	
13	☐ Chapter Review 1 p31 ☐ HW: Complete Chapter Review	
14	☐ Chapter Review 2 p32	
15	☐ Chapter Review 2 p32 ☐ HW: Complete Chapter Review	

Chapter 3   Area & Volume   (Measurement & Geometry ➜ Units)

★ Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids.

Lesson	Method	Resources
1	☐ Purpose of chapter. Importance of algebra for solving millions of problems ☐ Exercise 3.1 p34 (Model solutions for students) ☐ HW: Complete exercise & read and practice the Sweet Trick on p46	
2	☐ Exercise 3.2 p35 (Model solutions) ☐ 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 3.3 p36 (Model solutions) ☐ HW: Complete exercise	
4	☐ Exercise 3.4 p37 (Model solutions) ☐ HW: Complete exercise	
5	Group work working on a directed/choice/combination of: ☐ Investigations 3.1, 3.2, 3.3, 3.4 p42 ☐ Technology 3.1, 3.2 p44 ☐ A Game p43 ☐ HW: A couple of puzzles 1-2 p43	
6	Group work working on a directed/choice/combination of: ☐ Investigations 3.1, 3.2, 3.3, 3.4 p42 ☐ Technology 3.1, 3.2 p44 ☐ A Game p43 ☐ HW: A couple of puzzles 2-4 p43	
7	☐ Mental computation 3.7 p40 ☐ Chapter Review 1 p45 ☐ HW: Competition questions 1-2 p41	
8	☐ Mental computation 3.8 p40 ☐ Chapter Review 1 p45 ☐ HW: Competition questions 3-4 p41	
9	☐ Mental computation 3.9 p40 ☐ Chapter Review 2 p46 ☐ HW: Competition questions 5-6 p41	
10	☐ Chapter Review 2 p46 ☐ HW: Complete Chapter Review	

A Task

Work on one of the four tasks at the beginning of each chapter.
(Page 1, page 17, page 33, page 47)

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   Algebra 1   (Number & Algebra ➥ Patterns and Algebra)
- Factorise algebraic expressions by taking out a common algebraic factor.
- Simplify algebraic products and quotients using index laws.
- Apply the four operations to simple algebraic fractions with numerical denominators.

Chapter 2   Linear Equations   (Number & Algebra ➥ Linear & Non-linear)
- Solve problems involving linear equations, including those derived from formulas.
- Solve linear inequalities and graph their solutions on a number line.
- Solve linear simultaneous equations, using algebraic and graphical techniques including using digital technology.

Chapter 3   Area & Volume (Measurement & Geometry ➥ Using Units of Measurement)
- Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids.

Chapter 5   Review
- Review of all of above.

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