



Lesson Plans

Year 10A 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	2 weeks
Chapter 2	Linear Eqns	Number & Algebra - Linear & Non-linear	2 weeks
Chapter 3	Measurement & Geometry	Measurement & Geometry - Units	2 weeks
Chapter 4	Indices, Surds & Logs	Number and Algebra - Real Numbers	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 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.

- 10A** ★ Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids.

Chapter 4 Money (Number and Algebra → Real Numbers)

- 10A** ★ Define rational and irrational numbers and perform operations with surds and fractional indices.

- 10A** ★ Use the definition of a logarithm to establish and apply the laws of logarithms.

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	<ul style="list-style-type: none"> <input type="checkbox"/> General (covering book, ruling pages, paste study guide etc.) <input type="checkbox"/> Purpose of chapter <input type="checkbox"/> Exercise 1.1 p2 (Model solutions for students) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p13 	
2	<ul style="list-style-type: none"> <input type="checkbox"/> Exercise 1.2 p3 <input type="checkbox"/> Exercise 1.3 p4 (Model solutions) <input type="checkbox"/> Technology 1.2, 1.3 p14 <input type="checkbox"/> Some students demonstrate the Sweet Trick p13 <input type="checkbox"/> HW: Complete Exercises and demonstrate Sweet Trick at home/lodgings 	
3	<ul style="list-style-type: none"> <input type="checkbox"/> Discussion about Sweet Trick - how to improve presentation <input type="checkbox"/> Exercise 1.4 p5 <input type="checkbox"/> Technology 1.2, 1.3 p14 <input type="checkbox"/> Exercise 1.5 p6 (Model solutions) <input type="checkbox"/> HW: Complete Exercises 	
4	<ul style="list-style-type: none"> <input type="checkbox"/> Exercise 1.6 p7 (Model solutions) <input type="checkbox"/> Investigation 1.1, 1.2 p12 <input type="checkbox"/> HW: Complete exercise and Investigations 1.1, 1.2 	Calculators
5	<ul style="list-style-type: none"> <input type="checkbox"/> Discussion of why employers are adamant that employees have adequate mental computation skills - also very useful revision technique <input type="checkbox"/> Mental computation Exercise 1.9 p10 <input type="checkbox"/> Exercise 1.7 p8 (Model solutions) <input type="checkbox"/> HW: Complete Exercise 	
6	<ul style="list-style-type: none"> <input type="checkbox"/> Mental computation Exercise 1.10 p10 <input type="checkbox"/> Exercise 1.8 p9 (Model solutions) <input type="checkbox"/> Technology 1.4 p14 <input type="checkbox"/> HW: Complete Exercise 	Internet
7	<ul style="list-style-type: none"> <input type="checkbox"/> Mental computation Exercise 1.11 p10 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <input type="checkbox"/> A couple of puzzles p13 <input type="checkbox"/> Investigations 1.3, 1.4 p12 <input type="checkbox"/> A game p13 <input type="checkbox"/> HW: Competition Questions 1-2 p11 	
8	<ul style="list-style-type: none"> <input type="checkbox"/> Competition Questions p11 (Model solutions) <input type="checkbox"/> HW: Complete Competition Questions 	
9	<ul style="list-style-type: none"> <input type="checkbox"/> Chapter Review 1 p15 <input type="checkbox"/> HW: Complete Chapter Review 	
10	<ul style="list-style-type: none"> <input type="checkbox"/> Chapter Review 2 p16 <input type="checkbox"/> 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	<input type="checkbox"/> Purpose of chapter <input type="checkbox"/> Exercise 2.1 p18 <input type="checkbox"/> Exercise 2.2 p19 (Model solutions for students) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p28	
2	<input type="checkbox"/> Exercise 2.3 p20 <input type="checkbox"/> Exercise 2.4 p21 <input type="checkbox"/> Some students demonstrate the Sweet Trick p28 <input type="checkbox"/> HW: Complete Exercise and demonstrate Sweet Trick at home/lodgings	
3	<input type="checkbox"/> Discussion about Sweet Trick - how to improve presentation <input type="checkbox"/> Exercise 2.5 p22 (Model solutions) <input type="checkbox"/> Exercise 2.6 p22 (Model solutions) <input type="checkbox"/> HW: Complete Exercises	Graph
4	<input type="checkbox"/> Investigation 2.1 p29 <input type="checkbox"/> Exercise 2.7 p24 (Model solutions) <input type="checkbox"/> HW: Complete exercise	Scales
5	<input type="checkbox"/> Mental computation Exercise 2.9 p26 <input type="checkbox"/> Revisit discussion of why employers are adamant that employees have adequate mental computation skills - also very useful revision technique <input type="checkbox"/> Exercise 2.8 p25 <input type="checkbox"/> HW: Competition Questions 1-3 p27	
6	<input type="checkbox"/> Mental computation Exercise 2.10 p26 Group work working on directed/choice/combination of: <ul style="list-style-type: none"> <input type="checkbox"/> A couple of puzzles p28 <input type="checkbox"/> A game p28 <input type="checkbox"/> Technology 2.1, 2.2 p30 <input type="checkbox"/> HW: Investigations 2.2 p28 	Internet
7	<input type="checkbox"/> Mental computation Exercise 2.11 p26 Group work working on directed/choice/combination of: <ul style="list-style-type: none"> <input type="checkbox"/> A couple of puzzles p28 <input type="checkbox"/> A game p28 <input type="checkbox"/> Technology 2.1, 2.2 p30 <input type="checkbox"/> HW: Investigations 2.2 p28 	Internet
8	<input type="checkbox"/> Competition Questions 4-9 p27 <input type="checkbox"/> HW: Complete Competition Questions	
9	<input type="checkbox"/> Chapter Review 1 p31 <input type="checkbox"/> HW: Complete Chapter Review	
10	<input type="checkbox"/> Chapter Review 2 p32 <input type="checkbox"/> 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.

10A ★ Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids.

Lesson	Method	Resources
1	<input type="checkbox"/> Purpose of chapter. Importance of algebra for solving millions of problems <input type="checkbox"/> Exercise 3.1 p34 <input type="checkbox"/> Exercise 3.2 p35 (Model solutions for students) <input type="checkbox"/> HW: Complete exercises & read and practice the Sweet Trick on p46	
2	<input type="checkbox"/> Exercise 3.3 p36 (Model solutions) <input type="checkbox"/> Some students demonstrate the Sweet Trick p46 <input type="checkbox"/> HW: Complete exercise and demonstrate Sweet Trick at home/lodgings	
3	<input type="checkbox"/> Discussion about Sweet Trick - how to improve presentation <input type="checkbox"/> Exercise 3.4 p37 (Model solutions) <input type="checkbox"/> HW: Complete exercise	
4	<input type="checkbox"/> Exercise 3.5 p38 (Model solutions) <input type="checkbox"/> Competition exercise 3.10 Q1-2, p41 <input type="checkbox"/> HW: Complete exercises	
5	<input type="checkbox"/> Mental computation Exercise 3.7 p40 <input type="checkbox"/> Exercise 3.6 p39 (Model solutions) <input type="checkbox"/> HW: Complete exercise	
6	<input type="checkbox"/> Mental computation Exercise 3.8 p40 <input type="checkbox"/> Competition exercise 3.10 Q3-8, p41 <input type="checkbox"/> HW: Complete exercises	
7	<input type="checkbox"/> Mental computation Exercise 3.9 p40 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <input type="checkbox"/> Investigations 3.1, 3.2, 3.3, 3.4 p42 <input type="checkbox"/> Technology 3.1, 3.2 p44 <input type="checkbox"/> A Game p43 <input type="checkbox"/> HW: A couple of puzzles 1-2 p43 	
8	Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <input type="checkbox"/> Investigations 3.1, 3.2, 3.3, 3.4 p42 <input type="checkbox"/> Technology 3.1, 3.2 p44 <input type="checkbox"/> A Game p43 <input type="checkbox"/> HW: A couple of puzzles 2-4 p43 	
9	<input type="checkbox"/> Chapter Review 1 p45 <input type="checkbox"/> HW: Complete Chapter Review and a couple of puzzles p48	
10	<input type="checkbox"/> Chapter Review 2 p46 <input type="checkbox"/> HW: Complete Chapter Review	

Chapter 4 Indices, Surds, Logs

(Number and Algebra → Real Numbers)

10A ★ Define rational and irrational numbers and perform operations with surds and fractional indices.

10A ★ Use the definition of a logarithm to establish and apply the laws of logarithms.

Lesson	Method	Resources
1	<input type="checkbox"/> Purpose of chapter <input type="checkbox"/> Exercise 4.1 p48 (Model solutions for students) <input type="checkbox"/> Exercise 4.2 p49 (Model solutions) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p60, complete exercise	
2	<input type="checkbox"/> Exercise 4.3 p49 (Model solutions) <input type="checkbox"/> Exercise 4.4 p50 (Model solutions) <input type="checkbox"/> Some students demonstrate the Sweet Trick p60 <input type="checkbox"/> HW: Complete exercise and demonstrate Sweet Trick at home/lodgings	
3	<input type="checkbox"/> Exercise 4.5 p50 (Model solutions) <input type="checkbox"/> Exercise 4.6 p51 (Model solutions) <input type="checkbox"/> Investigation 4.1 p58 <input type="checkbox"/> HW: Complete exercises	Compass Ruler
4	<input type="checkbox"/> Exercise 4.7 p52 (Model solutions) <input type="checkbox"/> Exercise 4.8 p52 (Model solutions) <input type="checkbox"/> HW: Complete exercises	
5	<input type="checkbox"/> Mental computation Exercise 4.13 p56 <input type="checkbox"/> Exercise 4.9 p53 (Model solutions) <input type="checkbox"/> Exercise 4.10 p53 (Model solutions) <input type="checkbox"/> HW: Complete exercises	
6	<input type="checkbox"/> Mental computation Exercise 4.14 p56 <input type="checkbox"/> Exercise 4.11 p54 (Model solutions) <input type="checkbox"/> Competition exercises Q1-2 p57 <input type="checkbox"/> HW: Complete above exercises	
7	<input type="checkbox"/> Mental computation Exercise 4.15 p56 <input type="checkbox"/> Exercise 4.12 p55 (Model solutions) <input type="checkbox"/> Competition exercises Q3-4 p57 <input type="checkbox"/> HW: Complete above exercises	
8	Group work working on a directedchoice/combination of: <input type="checkbox"/> Investigations 4.2, 4.3 p58 <input type="checkbox"/> Technology 4.2, 4.3, 4.4 p59 <input type="checkbox"/> A Game p60 <input type="checkbox"/> A couple of puzzles p60 <input type="checkbox"/> HW: Competition exercises 5-9 p57	Compass Ruler Internet
9	<input type="checkbox"/> Chapter Review 1 p61 <input type="checkbox"/> HW: Complete Chapter Review	
10	<input type="checkbox"/> Chapter Review 2 p62 <input type="checkbox"/> 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	<ul style="list-style-type: none"> <input type="checkbox"/> Setup <input type="checkbox"/> Decide whether tasks completed individually, groups of two, three, or four <input type="checkbox"/> Decide which tasks are assigned to individuals/groups <input type="checkbox"/> Decide how tasks are to be presented: Oral presentation, poster presentation (on classroom wall), power point presentation etc. <input type="checkbox"/> If the presentation will take class time then decide when. <input type="checkbox"/> Each lesson may be started with a mental computation or a summary of what is expected from the work on the tasks. 	Textbook Assessment 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)

10A

- Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids.
- Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids.

Chapter 4 Money (Number and Algebra → Real Numbers)

10A

- Define rational and irrational numbers and perform operations with surds and fractional indices.
- Use the definition of a logarithm to establish and apply the laws of logarithms.

10A

Chapter 5 Review

- Review of all of above.

Lesson	Method	Resources
1-10	<ul style="list-style-type: none"> <input type="checkbox"/> Purpose of Review <input type="checkbox"/> Review 1 p64 <input type="checkbox"/> Review 2 p67 <input type="checkbox"/> Repetition of above until mastery? <input type="checkbox"/> Sample end of term papers (www.drdwyer.com.au) <input type="checkbox"/> Assessment 	Textbook Assessment instruments