



Lesson Plans

Year 10A Mathematics

TERM 4

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 4 Lessons (10 weeks)

Chapter 16	Coordinate Geometry	Number and Algebra - Linear & Non-linear	2 weeks
Chapter 17	Geometric Reasoning	Measurement & Geom - Geometric Reason.	2 weeks
Chapter 18	Statistics 2	Statistics & Probability - Data Rep. & Inter.	2 weeks
Chapter 19	Trigonometry 2	Number and Algebra - Pythagoras & Trig.	2 weeks
Chapter 20	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 16 Coordinate Geometry (Number & Algebra → Linear & Non-linear Relationships)

- ★ Solve problems involving parallel and perpendicular lines.
- ★ Explore the connection between algebraic and graphical representations of relations such as simple quadratics and circles using digital technology as appropriate.

Chapter 17 Geometric Reasoning (Measurement & Geometry → Pythagoras & Trigonometry)

- ★ Formulate proofs involving congruent triangles and angle properties.
- ★ Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes.

10A ★ Prove and apply angle and chord properties of circles.

Chapter 18 Statistics 2 (Statistics & Probability → Data Representation & Interpretion)

- ★ Use scatter plots to investigate and comment on relationships between two numerical variables.
- ★ Investigate and describe bivariate numerical data where the independent variable is time.
- ★ Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data.

10A ★ Use information technologies to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation.

Chapter 19 Trigonometry 2 (Measurement & Geometry → Pythagoras & Trigonometry)

10A ★ Establish the sine, cosine and area rules for any triangle and solve related problems.

10A ★ Use the unit circle to define trigonometric functions, and graph them with and without the use of digital technologies.

10A ★ Solve simple trigonometric equations.

10A ★ Apply Pythagoras' theorem and trigonometry to solving three-dimensional problems in right-angled triangles.

Chapter 20 Review

- ★ Review of all of above.

Chapter 16 Coordinate Geometry

(Number & Algebra → Linear & Non-linear Relationships)

- ★ Solve problems involving parallel and perpendicular lines.
- ★ Explore the connection between algebraic and graphical representations of relations such as simple quadratics and circles using digital technology as appropriate.

Lesson	Method	Resources
1	<input type="checkbox"/> General (covering book, ruling pages, paste study guide etc.) <input type="checkbox"/> Purpose of chapter <input type="checkbox"/> Exercise 16.1 p214 (Model solutions for students) <input type="checkbox"/> Exercise 16.2 p215 (Model solutions) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p225	
2	<input type="checkbox"/> Exercise 16.3 p216 (Model solutions) <input type="checkbox"/> Exercise 16.4 p217 (Model solutions) <input type="checkbox"/> Some students demonstrate the Sweet Trick p225 <input type="checkbox"/> HW: Complete Exercises and demonstrate Sweet Trick at home/lodgings	
3	<input type="checkbox"/> Discussion about Sweet Trick - how to improve presentation <input type="checkbox"/> Exercise 16.5 p218 (Model solutions) <input type="checkbox"/> Exercise 16.6 p219 (Model solutions) <input type="checkbox"/> HW: Complete Exercises	
4	<input type="checkbox"/> Exercise 16.7 p220 (Model solutions) <input type="checkbox"/> Exercise 16.8 p221 (Model solutions) <input type="checkbox"/> HW: Complete exercise	
5	<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 16.9 p222 <input type="checkbox"/> Technology 16.1, 16.2, 16.3 p226 (Model solutions) <input type="checkbox"/> HW: Complete Exercises	Calculators Graphics calculators Internet
6	<input type="checkbox"/> Mental computation Exercise 16.10 p222 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <input type="checkbox"/> A couple of puzzles p225 <input type="checkbox"/> Investigations 16.1, 16.2, 16.3, 16.4 p224 <input type="checkbox"/> A game p225 	Internet Variety of screws Protractors
7	<input type="checkbox"/> Mental computation Exercise 16.11 p222 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <input type="checkbox"/> A couple of puzzles p225 <input type="checkbox"/> Investigations 16.1, 16.2, 16.3, 16.4 p224 <input type="checkbox"/> A game p225 <input type="checkbox"/> HW: Complete activities 	Internet
8	<input type="checkbox"/> Competition Questions p223 (Model solutions) <input type="checkbox"/> HW: Complete Competition Questions	
9	<input type="checkbox"/> Chapter Review 1 p227 <input type="checkbox"/> HW: Complete Chapter Review	
10	<input type="checkbox"/> Chapter Review 2 p228 <input type="checkbox"/> HW: Complete Chapter Review	

Chapter 17 Geometric Reasoning

(Measurement & Geometry → Pythagoras & Trigonometry)

- ★ Formulate proofs involving congruent triangles and angle properties.
- ★ Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes.
- 10A** ★ Prove and apply angle and chord properties of circles.

Lesson	Method	Resources
1	<input type="checkbox"/> Purpose of chapter. Importance of Trig for solving millions of problems <input type="checkbox"/> Exercise 17.1 p230 (Model solutions for students) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p240	
2	<input type="checkbox"/> Exercise 17.2 p231 (Model solutions) <input type="checkbox"/> Some students demonstrate the Sweet Trick p240 <input type="checkbox"/> HW: Complete Exercises and demonstrate Sweet Trick at home/lodgings	
3	<input type="checkbox"/> Discussion about Sweet Trick - how to improve presentation <input type="checkbox"/> Exercise 17.3 p232 (Model solutions) <input type="checkbox"/> Exercise 17.4 p233 (Model solutions) <input type="checkbox"/> HW: Complete Exercises	
4	<input type="checkbox"/> Exercise 17.5 p234 (Model solutions) <input type="checkbox"/> HW: Complete exercise	
5	<input type="checkbox"/> Mental computation Exercise 17.9 p238 <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 17.6 p235 <input type="checkbox"/> Competition Questions 1-5 p239 <input type="checkbox"/> HW: Complete exercises	
6	<input type="checkbox"/> Mental computation Exercise 17.10 p238 <input type="checkbox"/> Exercise 17.7 p236 <input type="checkbox"/> Competition Questions 6-10 p239 <input type="checkbox"/> HW: Complete Exercises	
	<input type="checkbox"/> Mental computation Exercise 17.11 p238 <input type="checkbox"/> Exercise 17.8 p237 <input type="checkbox"/> Competition Questions 11-15 p239 <input type="checkbox"/> HW: Complete Exercises	
7	Group work working on directed/choice/combination of: <input type="checkbox"/> A couple of puzzles p240 <input type="checkbox"/> A game p240 <input type="checkbox"/> Investigations 17.1, 17.2, 17.3, 17.4 p241 <input type="checkbox"/> Technology 17.1, 17.2, 17.3, 17.4 p242	Internet Spreadsheet Geometry instruments
9	<input type="checkbox"/> Chapter Review 1 p243 <input type="checkbox"/> HW: Complete Chapter Review	
10	<input type="checkbox"/> Chapter Review 2 p244 <input type="checkbox"/> HW: Complete Chapter Review	

Chapter 18 Statistics 2 (Statistics & Probability → Data Representation & Interpretation)

- ★ Use scatter plots to investigate and comment on relationships between two numerical variables.
- ★ Investigate and describe bivariate numerical data where the independent variable is time.
- ★ Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data.

- 10A** ★ Use information technologies to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation.

Lesson	Method	Resources
1	<input type="checkbox"/> Purpose of chapter. <input type="checkbox"/> Exercise 18.1 p247 (Model solutions for students) <input type="checkbox"/> HW: Complete exercises & read and practice the Sweet Trick on p257	
2	<input type="checkbox"/> Exercise 18.2 p248 (Model solutions) <input type="checkbox"/> Exercise 18.3 p249 (Model solutions) <input type="checkbox"/> Some students demonstrate the Sweet Trick p257 <input type="checkbox"/> HW: Complete exercises and demonstrate Sweet Trick at home/lodgings	
3	<input type="checkbox"/> Discussion about Sweet Trick - how to improve presentation <input type="checkbox"/> Exercise 18.4 p250 (Model solutions) <input type="checkbox"/> Exercise 18.5 Q 1 p251 (Model solutions) <input type="checkbox"/> HW: Complete exercises	
4	<input type="checkbox"/> Exercise 18.5 Q2-3 p251 (Model solutions) <input type="checkbox"/> HW: Complete exercises	
5	<input type="checkbox"/> Mental computation Exercise 18.7 p254 <input type="checkbox"/> Exercise 18.6 Q1-2 p252 (Model solutions) <input type="checkbox"/> HW: Complete exercises	
6	<input type="checkbox"/> Mental computation Exercise 18.8 p254 <input type="checkbox"/> Exercise 18.6 Q3-4 p252 (Model solutions) <input type="checkbox"/> HW: Complete exercise	
7	<input type="checkbox"/> Mental computation Exercise 18.9 p254 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <input type="checkbox"/> Competition Questions p255 <input type="checkbox"/> Investigations 18.1, 18.2, 18.3 p258 <input type="checkbox"/> Technology 18.1, 18.2 p256 <input type="checkbox"/> A Game p257 <input type="checkbox"/> A couple of puzzles p257 	Spreadsheets Graphics Calculators
8	Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <input type="checkbox"/> Competition Questions p255 <input type="checkbox"/> Investigations 18.1, 18.2, 18.3 p258 <input type="checkbox"/> Technology 18.1, 18.2 p256 <input type="checkbox"/> A Game p257 <input type="checkbox"/> A couple of puzzles p257 <input type="checkbox"/> HW: Complete activities 	Spreadsheets Graphics Calculators
9	<input type="checkbox"/> Chapter Review 1 p259 <input type="checkbox"/> HW: Complete Chapter Review	
10	<input type="checkbox"/> Chapter Review 2 p259 <input type="checkbox"/> HW: Complete Chapter Review	

Chapter 19 Trigonometry 2 (Measurement & Geometry → Pythagoras & Trigonometry)

- 10A** ★ Establish the sine, cosine and area rules for any triangle and solve related problems.
- 10A** ★ Use the unit circle to define trigonometric functions, and graph them with and without the use of digital technologies.
- 10A** ★ Solve simple trigonometric equations.
- 10A** ★ Apply Pythagoras' theorem and trigonometry to solving three-dimensional problems in right-angled triangles.

Lesson	Method	Resources
1	<input type="checkbox"/> Purpose of chapter <input type="checkbox"/> Exercise 19.1 p262 (Model solutions) <input type="checkbox"/> Exercise 19.2 p262 (Model solutions) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p273, complete exercise	Graph paper
2	<input type="checkbox"/> Exercise 19.3 p263 (Model solutions) <input type="checkbox"/> Some students demonstrate the Sweet Trick p273 <input type="checkbox"/> HW: Complete exercises and demonstrate Sweet Trick at home/lodgings	
3	<input type="checkbox"/> Exercise 19.4 p264 (Model solutions) <input type="checkbox"/> HW: Complete exercise	
4	<input type="checkbox"/> Mental computation Exercise 19.9 p270 <input type="checkbox"/> Exercise 19.5 p265 (Model solutions) <input type="checkbox"/> HW: Complete exercise	
5	<input type="checkbox"/> Mental computation Exercise 19.10 p270 <input type="checkbox"/> Exercise 19.6 p266 (Model solutions) <input type="checkbox"/> Exercise 19.7 p267 (Model solutions) <input type="checkbox"/> HW: Complete exercise	
6	<input type="checkbox"/> Mental computation Exercise 19.11 p270 <input type="checkbox"/> Exercise 19.8 p268 (Model solutions) <input type="checkbox"/> HW: Complete above exercises	
7	Group work working on a directedchoice/combination of: <input type="checkbox"/> Investigations 19.1, 19.2, 19.3 p271 <input type="checkbox"/> Technology 19.1 p274 <input type="checkbox"/> A Game p273 <input type="checkbox"/> A couple of puzzles p273 <input type="checkbox"/> Competition Questions p271 <input type="checkbox"/> HW: Complete activities	Internet Geometry instruments Graphics calculators
8	Group work working on a directedchoice/combination of: <input type="checkbox"/> Investigations 19.1, 19.2, 19.3 p271 <input type="checkbox"/> Technology 19.1 p274 <input type="checkbox"/> A Game p201 <input type="checkbox"/> A couple of puzzles p273 <input type="checkbox"/> Competition Questions p273 <input type="checkbox"/> HW: Complete activities	Internet Geometry instruments Graphics calculators
9	<input type="checkbox"/> Chapter Review 1 p275 <input type="checkbox"/> HW: Complete Chapter Review	
10	<input type="checkbox"/> Chapter Review 2 p275 <input type="checkbox"/> HW: Complete Chapter Review	

A Task

Work on one of the four tasks at the beginning of each chapter.
(Page 213, page 229, page 245, page 261)

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 15 Review

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Chapter 20 Review

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Lesson	Method	Resources
1-10	<ul style="list-style-type: none"> <input type="checkbox"/> Purpose of Review <input type="checkbox"/> Review 1 p278 <input type="checkbox"/> Review 2 p281 <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