



# Lesson Plans

## Year 7 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	Ratio & Rate	Number & Algebra - Real Numbers	2 weeks
Chapter 17	Linear Equations	Number & Algebra - Linear & Non	2 weeks
Chapter 18	Transformations	Measurement & Geometry - Transfmm	2 weeks
Chapter 19	Data 2	Statistics & Probability - Data	2 weeks
Chapter 20	Review		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
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## Year 7 Content Description

### Chapter 16 Ratio & Rate (Number & Algebra → Real Numbers)

- ★ Recognise and solve problems involving simple ratios.
- ★ Understand that rate and ratio problems can be solved using fractions or percentages and choosing the most efficient form to solve a particular problem.
- ★ Find percentages of quantities and express one quantity as a percentage of another.
- ★ Use authentic problems to express quantities as percentages of other amounts.

### Chapter 17 Linear Equations (Number & Algebra → Linear & Non-linear Relationships)

- ★ Solve simple linear equations.
- ★ Solve real-life problems by using pronumerals to represent unknowns.
- ★ Use travel graphs to investigate and compare the distance travelled to and from school
- ★ Interpret features of travel graphs such as the slope of lines and the meaning of horizontal lines.
- ★ Use graphs of evaporation rates to explore water storage.

### Chapter 18 Transformations (Measurement & Geometry → Location & Transformation)

- ★ Describe translations, reflections, and rotations.
- ★ Identify line and rotational symmetries.
- ★ Identify combinations of transformations that produce the same result.
- ★ Using digital technologies to experiment with patterns.

### Chapter 19 Data 2 (Statistics & Probability → Data)

- ★ Identify and investigate issues collected from primary and secondary sources.
- ★ Investigate secondary data sets to answer comparative questions.
- ★ Construct and compare a range of data displays.
- ★ Use ordered stem-and-leaf plots to record and display numerical data collected in a class investigation.
- ★ Investigate relationships between data.

### Chapter 20 Review

- ★ Review of all of above.

## Chapter 16 Ratio & Rate (Number & Algebra → Real Numbers)

- ★ Recognise and solve problems involving simple ratios.
- ★ Understand that rate and ratio problems can be solved using fractions or percentages and choosing the most efficient form to solve a particular problem.
- ★ Find percentages of quantities and express one quantity as a percentage of another.
- ★ Use authentic problems to express quantities as percentages of other amounts.

Lesson	Method	Resources
1	<input type="checkbox"/> Purpose of chapter <input type="checkbox"/> Exercise 16.1 p216 (Model solutions) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p225	
2	<input type="checkbox"/> Exercise 16.2 p217 <input type="checkbox"/> Exercise 16.3 p217 (Model solutions) <input type="checkbox"/> Exercise 16.4 p218 <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 <input type="checkbox"/> Exercise 16.6 p219 <input type="checkbox"/> Exercise 16.7 p219 <input type="checkbox"/> HW: Complete Exercises	
4	<input type="checkbox"/> Short mental test on fractions - repeat until efficient <input type="checkbox"/> Exercise 16.8 p220 (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 p221 <input type="checkbox"/> NAPLAN Questions p222 (Model solutions) <input type="checkbox"/> HW: Complete NAPLAN Questions	
6	<input type="checkbox"/> Mental computation Exercise 16.10 p221 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Investigation 16.1, 16.2 p224</li> <li><input type="checkbox"/> A game p225</li> <li><input type="checkbox"/> Technology 16.1, 16.2 p226</li> <li><input type="checkbox"/> HW: A couple of puzzles p225</li> </ul>	compass rulers tape measures calculators
7	<input type="checkbox"/> Mental computation Exercise 16.11 p221 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Investigation 16.1, 16.2 p224</li> <li><input type="checkbox"/> A game p225</li> <li><input type="checkbox"/> Technology 16.1, 16.2 p226</li> </ul>	compass rulers tape measures calculators
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 Linear Equations (Number & Algebra → Linear & Non-linear Relationships)

- ★ Solve simple linear equations.
- ★ Solve real-life problems by using pronumerals to represent unknowns.
- ★ Use travel graphs to investigate and compare the distance travelled to and from school
- ★ Interpret features of travel graphs such as the slope of lines and the meaning of horizontal lines.
- ★ Use graphs of evaporation rates to explore water storage.

Lesson	Method	Resources
1	<input type="checkbox"/> Purpose of chapter. Importance of algebra for solving millions of problems <input type="checkbox"/> Exercise 17.1 p230 <input type="checkbox"/> Exercise 17.2 p231 (Model solutions for students) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p241	
2	<input type="checkbox"/> Short mental test on subtracting 71 eg 123–71 <input type="checkbox"/> Exercise 17.3 p232 <input type="checkbox"/> Some students demonstrate the Sweet Trick p241 <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 17.4 p233 (Model solutions) <input type="checkbox"/> HW: Complete Exercise	graph paper?
4	<input type="checkbox"/> Exercise 17.5 p234 (Model solutions) <input type="checkbox"/> HW: Complete exercise	graph paper?
5	<input type="checkbox"/> Mental computation Exercise 17.8 p237 <input type="checkbox"/> Exercise 17.6 p235 (Model solutions) <input type="checkbox"/> HW: Complete exercises	
6	<input type="checkbox"/> Mental computation Exercise 17.9 p237 <input type="checkbox"/> Exercise 17.7 p236 (Model solutions) <input type="checkbox"/> HW: Complete exercises	
7	<input type="checkbox"/> Mental computation Exercise 17.10 p237 Group work working on directed/choice/combination of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Investigations 17.1, 17.2 p242</li> <li><input type="checkbox"/> A game p241</li> <li><input type="checkbox"/> Technology 17.1, 17.2 p240</li> <li><input type="checkbox"/> HW: A couple of puzzles p241</li> </ul>	computers graphics calculators stop watches tape measures
8	<input type="checkbox"/> NAPLAN Questions p238 <input type="checkbox"/> Competition Questions p239 <input type="checkbox"/> HW: Complete NAPLAN Questions	
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 Transformations (Measurement & Geometry → Location & Transformation)

- ★ Describe translations, reflections, and rotations.
- ★ Identify line and rotational symmetries.
- ★ Identify combinations of transformations that produce the same result.
- ★ Using digital technologies to experiment with patterns

Lesson	Method	Resources
1	<input type="checkbox"/> Purpose of chapter. <input type="checkbox"/> Exercise 18.1 p246 <input type="checkbox"/> Exercise 18.2 p247 (Model solutions) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p258 and complete exercises	
2	<input type="checkbox"/> Exercises 18.3, 18.4 p248 <input type="checkbox"/> Exercises 18.5, 18.6 p249 <input type="checkbox"/> Some students demonstrate the Sweet Trick p258 <input type="checkbox"/> HW: Complete Exercises and demonstrate Sweet Trick at home/lodgings	graph paper? rope
3	<input type="checkbox"/> Discussion about Sweet Trick - how to improve presentation <input type="checkbox"/> Exercise 18.7 p250 <input type="checkbox"/> HW: A couple of puzzles p258	
4	<input type="checkbox"/> Exercise 18.8 p251 <input type="checkbox"/> HW: Complete exercise	scissors rulers
5	<input type="checkbox"/> Mental computation Exercise 18.10 p253 <input type="checkbox"/> Exercise 18.9 p252 (Model solutions) <input type="checkbox"/> HW: Complete exercise	scissors rulers
6	<input type="checkbox"/> Mental computation Exercise 18.11 p253 <input type="checkbox"/> NAPLAN Questions p254 (Model solutions) <input type="checkbox"/> Competition Questions p254 (Model solutions) <input type="checkbox"/> HW: Complete NAPLAN Questions	
7	<input type="checkbox"/> Mental computation Exercise 18.12 p253 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Investigations 18.1, 18.2, 18.3 p257</li> <li><input type="checkbox"/> Technology 18.1, 18.2, 18.3 p256</li> <li><input type="checkbox"/> A Game p258</li> </ul>	mirrors digital camera computers Internet
8	Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Investigations 18.1, 18.2, 18.3 p257</li> <li><input type="checkbox"/> Technology 18.1, 18.2, 18.3 p256</li> <li><input type="checkbox"/> A Game p258</li> </ul>	mirrors digital camera computers Internet
9	<input type="checkbox"/> Chapter Review 1 p259 <input type="checkbox"/> HW: Complete Chapter Review and a couple of puzzles p48	
10	<input type="checkbox"/> Chapter Review 2 p260 <input type="checkbox"/> HW: Complete Chapter Review	

## Chapter 19 Data 2 (Statistics & Probability → Data)

- ★ Identify and investigate issues collected from primary and secondary sources.
- ★ Investigate secondary data sets to answer comparative questions.
- ★ Construct and compare a range of data displays.
- ★ Use ordered stem-and-leaf plots to record and display numerical data collected in a class investigation.
- ★ Investigate relationships between data.

Lesson	Method	Resources
1	<input type="checkbox"/> Purpose of chapter <input type="checkbox"/> Exercise 19.1 p263 (Model solutions) <input type="checkbox"/> HW: Read and practice the Sweet Trick on p272, complete exercise	
2	<input type="checkbox"/> Exercise 19.2 p265 (Model solutions) <input type="checkbox"/> Some students demonstrate the Sweet Trick p272 <input type="checkbox"/> HW: Complete exercise and demonstrate Sweet Trick at home/lodgings	
3	<input type="checkbox"/> Exercise 19.3 p267 <input type="checkbox"/> HW: Complete exercise	
4	<input type="checkbox"/> Exercise 19.4 p268 <input type="checkbox"/> HW: Complete above exercise	
5	<input type="checkbox"/> Mental computation Exercise 19.5 p269 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Investigations 19.1, 19.2, 19.3 p270</li> <li><input type="checkbox"/> Technology 19.1, 19.2 p271</li> <li><input type="checkbox"/> A Game p272</li> <li><input type="checkbox"/> HW: A couple of puzzles p272</li> </ul>	spreadsheet graphics calculator rulers circular objects
6	<input type="checkbox"/> Mental computation Exercise 19.6 p269 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Investigations 19.1, 19.2, 19.3 p270</li> <li><input type="checkbox"/> Technology 19.1, 19.2 p271</li> <li><input type="checkbox"/> A Game p272</li> </ul>	spreadsheet graphics calculator rulers circular objects
7	<input type="checkbox"/> Mental computation Exercise 19.7 p269 Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Investigations 19.1, 19.2, 19.3 p270</li> <li><input type="checkbox"/> Technology 19.1, 19.2 p271</li> <li><input type="checkbox"/> A Game p272</li> </ul>	spreadsheet graphics calculator rulers circular objects
8	Group work working on a directed/choice/combination of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Investigations 19.1, 19.2, 19.3 p270</li> <li><input type="checkbox"/> Technology 19.1, 19.2 p271</li> <li><input type="checkbox"/> A Game p272</li> </ul>	spreadsheet graphics calculator rulers circular objects
9	<input type="checkbox"/> Chapter Review 1 p273 <input type="checkbox"/> HW: Complete Chapter Review	
10	<input type="checkbox"/> Chapter Review 2 p273 <input type="checkbox"/> HW: Complete Chapter Review	

## A Task

Work on one of the four tasks at the beginning of each chapter.  
(Page 215, page 229, page 245, page 261)

Lesson	Method	Resources
1-5	<ul style="list-style-type: none"> <li><input type="checkbox"/> Setup</li> <li><input type="checkbox"/> Decide whether tasks completed individually, groups of two, three, or four</li> <li><input type="checkbox"/> Decide which tasks are assigned to individuals/groups</li> <li><input type="checkbox"/> Decide how tasks are to be presented: Oral presentation, poster presentation (on classroom wall), power point presentation etc.</li> <li><input type="checkbox"/> If the presentation will take class time then decide when.</li> <li><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.</li> </ul>	Textbook Assessment instruments

## Chapter 20 Review

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- ★ Investigate relationships between data.

Lesson	Method	Resources
1-10	<ul style="list-style-type: none"> <li><input type="checkbox"/> Purpose of Review</li> <li><input type="checkbox"/> Review 1 p276</li> <li><input type="checkbox"/> Review 2 p279</li> <li><input type="checkbox"/> Repetition of above until mastery?</li> <li><input type="checkbox"/> Sample end of term papers (<a href="http://www.drdwyer.com.au">www.drdwyer.com.au</a>)</li> <li><input type="checkbox"/> Assessment</li> </ul>	Textbook Assessment instruments