

Student  
name:



St Andrew's College

# Year 9 Mathematics 2017

## Course Handbook

Welcome to the Year 9 Mathematics course at St. Andrew's College.

In this booklet we will explain:

- the content of the course,
- what you need in terms of books and equipment,
- what opportunities are provided to help your learning, and
- how you will be assessed.

**COURSE CONTENT:** Mathematics in New Zealand is broken down into three strands, and these are Number and Algebra, Geometry and Measurement, and Statistics. In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations in every topic studied. The Year 9 course is designed to be interesting, challenging, and to form a solid foundation for Year 10 and NCEA. We hope you enjoy Mathematics this year, that you ask questions whenever you don't understand, and that you take advantage of the opportunities that are here for you at St Andrew's.

**ASSESSMENT:** You will have lots of different types of assessment. Some of the assessments will be used to see how you are going so that you and so the teacher can plan what is needed for you to keep doing better. Other assessments will occur at the end of a topic to get a picture of what skills, knowledge and processes you have mastered in that topic. Many of the results will be grades reflecting:

- your level of achievement against the National Curriculum levels, and
- your level of thinking using the SOLO taxonomy.

Assessments may be in the form of a project; an assignment; a skills test; or a group investigation. It is important that you do your best in your assessments so that you can use them to measure your own progress and focus on what you can do to continue learning. You can record the results of assessments in this booklet.

**TRACKING:** This is to identify skill strengths and weaknesses in Number and Algebra. These skills can be practised using Education Perfect. You may record your results so you can easily see your progress. There are also topics for each of the tracking sheets and working through the exercises in these topics will provide extra practice and learning.

There are three different tracking sheets that you will encounter; With Calculator, No Calculator and Algebra.

**FLUENCY/MASTERY:** We believe that basic arithmetic skills are an essential aspect of Mathematics and students will be required to practise these on a regular basis. Again Education Perfect can help with speed and fluency. Copies of the fluency spreadsheets are on the Year 9 Moodle page. Instructions on how to print a scrambled version of each sheet is also there.

**EXAMINATION:** At the end of this year students will be required to sit a 2 hour examination which will cover aspects of the course studied throughout the year. It may also call on skills developed in previous years' work.

**COMPETITIONS:** Year 9 students are offered the opportunity to compete in problem solving competitions during the course of the year. The entry fee associated with these is approximately \$6 for each and will be charged to accounts when students indicate their interest to their teacher.

- Otago Junior Mathematics Competition (5<sup>th</sup> April 2017)
- Australian Mathematics Competition (27<sup>th</sup> July 2017)
- Cantamath Team Competition -Two teams selected (23<sup>rd</sup> August 2017)

**EQUIPMENT:** Each period students are expected to have their own working equipment consisting of a ruler, compass, a protractor and a calculator as well as the usual writing equipment (pens, pencil, eraser). A calculator may be needed and students are expected to bring one to each Maths period. There will be times when students are required to work WITHOUT a calculator in which case the teacher will indicate this.



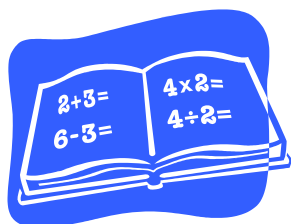
**CALCULATORS:** Scientific Calculators are required to complete the work offered in this course. It is important that students have a suitable calculator to use in each period. The preferred model is the CASIO fx82-AU and is part of the stationery list.

**COMPUTERS:** These will be used for a variety of activities throughout the year. Students should bring their laptops to every lesson. The year 9 text will be in electronic form and students will be given the necessary material and instruction on how to load it.



All students should be familiar with checking their class OneNote notebooks, class Moodle pages as well as the Year 9 Maths page. Some teachers may also require you to bring headphones to class for the purpose of viewing tutorial videos.

**BOOKWORK:** We would like you to take pride in your work, so we do expect that your books will be neatly presented, and have no scribbles or graffiti. It is important that you show your working (thinking) at **all** times – mathematical communication is assessed at all levels. Full solutions that include logical reasoning and justification of ideas and methods; the final answer is just part of the solution.



You should also ensure work is marked and mistakes corrected. Making mistakes is part of learning, but unless we reflect on what we did wrong and what we could do to get it right, then that learning won't occur. Students with stylus enabled devices may be given the opportunity to use their device and OneNote as their work books.



**HOMEWORK:** One purpose of homework is for you to check that you can remember and use knowledge and skills learned in class, and to ensure that you have covered and practised all work in the syllabus. Homework will be set regularly at the discretion of your mathematics teacher.



Tasks may include: completing work started in class; completing exercises from the e-text or Education Perfect; completing worksheets provided by your teacher; planning, researching and carrying out an assignment; preparing for an assessment. Just as with bookwork, you need to know if your homework is correct so please ensure work is marked and mistakes corrected. ASK if you cannot correct a mistake or do not *understand* where you have gone wrong.

**TEXT:** Pearson Alpha Mathematics Year 9 is used as the basis for work in this course. The e-text documentation will be issued to you in class. This digital copy of the text belongs to you and will only be available on the laptop onto which you load it.

**ADDITIONAL WORKSHEETS:** These are frequently used, particularly where investigations are deemed to be an essential part of the learning process and should be filed neatly in your clear-file or glued into your book.

Numerous other resources can be located on the college Mathematics page or your own class Moodle site.

**Education Perfect:** Education Perfect is a dynamic, internet based teaching and learning tool that allows students to work at their own level. Students will be issued with a username and password that will allow them to access the Education Perfect website 24 hours a day for the whole year. For students who do not have appropriate internet access at home, they can work in the library during any lunchtime or after school. You should always have your Maths book with you so that you have somewhere to write your working and/or copy examples.



**ABSENCES:** Occasionally you may miss class because you have been sick or some other event has occurred.

If you are absent, YOU are responsible for catching up on the work missed. This is important because the skills you learn this year are needed for the work you will do next year and in NCEA.

To catch up on work you could:

- borrow a friend's book to see what was done on that day (copying out or photocopying any notes or exercises), OR
- arrange a time with your teacher to catch up the missed work.

**ADDITIONAL MATHS TUITION:** Sometimes you miss things in class or find a topic hard to understand. Often this can be quickly fixed by spending some time individually with a teacher outside class.

**MATHS 4 FREE:** This maths workshop operates every Monday and Tuesday in the library after school for additional help with mathematics.

**HOMEWORK CLUB:** Year 13 students offer assistance to all students from 3.30-4.30pm every Monday, Tuesday and Thursday. This takes place in various ground floor classrooms in the Arts Block.



## **EXPECTATION OF BEHAVIOUR IN THE MATHS CLASSROOM:**

Failure to observe any of these may result in a fatigue/detention.

- Arrive on time with the appropriate equipment ready to learn.
- If you are late, ensure you have a note from Middle School Office.
- Stand in silence at the start of the lesson when your teacher directs you to do so.
- Sit down when your teacher tells you to do so – this indicates that the lesson is about to start and your full attention is required.
- Food and drink (other than water) are not to be brought to the Maths classroom.
- Rooms should always be left as they are found.
- Treat other people and their property with respect.
- Chewing gum is not permitted in school and a detention will be issued immediately.
- No iPods, music players or phones are to be used in the Maths classroom. Without direct teacher permission.

All the best for a successful year! If you have any questions or queries, in the first instance please contact your Maths teacher. You may wish to contact Mr Mitchell Howard (Head of Mathematics and Teacher in Charge of Year 9 Mathematics) whose email address is [mho@stac.school.nz](mailto:mho@stac.school.nz) .

My maths teacher for 2017 is ..... (.....)

Student  
Signature

Parent  
Signature

# Year 9 Results

Topic	How did I feel at the start of the topic?	How did I feel at the end of the topic?	Assessment result	
Number 1				
Measurement and Geometry				
Pre-Algebra				
Algebra 1				
Algebra 2				
Statistics				
Probability				
<b>Learning Values</b>				
	Thinking and Creating	Collaboration	Striving to Achieve	Organisation
Interim				
Mid – goal				
Mid - teacher				
End– goal				
End - teacher				
<b>Fluency</b>				
Start of Year		End of Year		
<b>Mastery</b>				
	Initial Level of Mastery	Final Level of Mastery		
Addition				
Subtraction				
Multiplication				
Division				

# Year 9 Topic Summary

<p><b>NUMBER 1</b> <i>M&amp;S NZC Y9 chapters 2,3,5,9,10</i> Whole Numbers – estimation, powers &amp; primes Integers - Order of Operations Decimals Percentages, financial literacy</p>	<p><b>MEASUREMENT &amp; GEOMETRY</b> <i>M&amp;S NZC Y9 chapters 22, 23, 24, 25</i> Angles &amp; polygons Scales and the metric system Length, Area &amp; Volume</p>
<p><b>PRE-ALGEBRA</b> <i>M&amp;S NZC Y9 chapters 8,9</i> Fractions</p>	<p><b>ALGEBRA 1</b> <i>M&amp;S NZC Y9 chapter 11,12,13,14,15</i> Expressions Simplifying Equations Brackets</p>
<p><b>ALGEBRA 2</b> <i>M&amp;S NZC Y9 chapter 16,17,18</i> Co-ordinates 2-d Graphs Algebraic Graphs</p>	<p><b>STATISTICS</b> <i>M&amp;S NZC Y9 chapter 30,31,32</i> Interpreting data Interpreting and writing reports Statistical enquiry cycle</p>
<p><b>PROBABILITY</b> <i>M&amp;S NZC Y9 chapter 33</i> Randomness Experimental probability Theoretical probability</p>	

# MASTERY LEVELS

We feel it is important that every student gains mastery in some elementary areas of mathematics. In order to promote this, a series of basic mathematical skills are tested against the clock resulting in students attaining various levels of Mastery.

- |                         |                           |
|-------------------------|---------------------------|
| 50 or more correct..... | I am a MASTER             |
| 65 to 79 correct.....   | I am a GRAND MASTER       |
| 80 or more correct..... | I am a SUPER GRAND MASTER |

*Practice sheets are available on the intranet, these can be randomly generated using the F9 key.*

The challenge has been set: **How many can you do in 60 seconds?**

		Scores	Teacher Signature	Date Achieved
ADD	MASTER			
	GRAND MASTER			
	SUPER GRAND MASTER			
SUBTRACT	MASTER			
	GRAND MASTER			
	SUPER GRAND MASTER			
MULTIPLY	MASTER			
	GRAND MASTER			
	SUPER GRAND MASTER			
DIVIDE	MASTER			
	GRAND MASTER			
	SUPER GRAND MASTER			



# TRACKING PROGRESS CHARTS

Complete the following sheets by filling in boxes under each problem with

- a tick (✓) – I got it correct
- a cross (×) – I need to work on this

Complete the sheet when your marked tracking sheet is returned to you. This will help you:-

- identify areas of strength
- identify areas of weakness
- record improvement throughout the year

Use the Text references and Mathletics to improve your understanding when unsure and remember the other options for help....

- see your teacher
- see one of the Maths teacher in the library at lunchtime
- Maths 4 Free
- Homework Club

..... as outlined at the start of this booklet.



“Success seems to be connected with action. Successful people keep moving. They make mistakes but they don't quit.” ~ Conrad Hilton



# YEAR 9 TRACKING SHEET: ALGEBRA

## PROGRESS CHART

Add and subtract like terms	$x + x + x$	$2x + 3x - x$	$3x - 2x + 2y + y$	$2x - 5 - x + 9$	$5xy + 2x - xy - 4x$
Multiply algebraic terms	$x \times x \times x$	$x^4 \times x^3$	$4x^2 \times 2x$	$3x^2y \times 2y$	$6x^2y \times 3xy^4$
Divide algebraic terms	$\frac{6x}{2}$ or $\frac{6x}{x}$	$\frac{x^5}{x^2}$	$\frac{10x^4}{5x}$	$\frac{10x^4}{15x}$	$\frac{-4x}{6x^3}$
Substitute into formula: $x = 2, y = 3, z = -2$	$x + x + x$	$x + y$	$4x - y$	$yz$	$y^2 - z$
Expand one bracket	$2(x + 3)$	$x(x - 4)$	$3(2x + 1)$	$-2(x - 4)$	$6x(2x - 3)$
Solve equations	$x + 4 = 10$	$3x = 12$ or $\frac{x}{4} = 5$	$3x - 4 = 2$	$3(x + 4) = 19$	$\frac{x}{3} - 6 = 7$
Factorise into one bracket	$2x + 6$	$x^2 - 4x$	$6x + 3$	$-2x - 4$	$12x^2 - 18x$

I can do this

I need to work on this

# YEAR 9 TRACKING SHEET: NO CALC

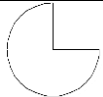
## PROGRESS CHART

Basic Arithmetic		$115 + 37$	$25 - 17$	$205 \times 32$	$248 \div 4$	$576 \div 12$
Bedmas		$3 + 4 \times 2$	$4 \times (3 + 2)$	$\frac{4 + 6}{2} - 3$	$3 + (5 - 1)^2$	$(4 + 4 \times 4) \div 2^2$
FRACTIONS	Add/Subtract	$\frac{1}{5} + \frac{3}{5}$	$3\frac{2}{5} + 2\frac{4}{5}$	$\frac{1}{2} - \frac{1}{3}$	$4 - 2\frac{1}{3}$	$3\frac{1}{4} + 2\frac{3}{8}$
	Multiply/Divide	$\frac{3}{5}$ of 20	$\frac{1}{5} \times \frac{2}{3}$	$\frac{3}{5} \div \frac{1}{4}$	$3\frac{1}{5} \times 4$	$2\frac{4}{5} \div 3\frac{1}{6}$
DECIMALS	Add/Subtract	$6.3 + 2$	$4.2 - 1.1$	$3.7 + 4.65$	$19.562 + 7.01$	$4.3 - 0.005$
	Multiply	$32.45 \times 10$	$4.23 \times 3$	$6.45 \times 0.4$	$3.48 \times 2.6$	$7.52 \times 0.43$
	Divide	$32.45 \div 10$	$12.69 \div 3$	$51.75 \div 3$	$29 \div 0.2$	$3.68 \div 0.2$
Percentages		28/50 as a percentage	10% of 160	75% of 240	Find GST to add onto \$220	120% of 48
Integers		$-6 + -8$	$13 - -7$	$6 \times -5$	$-24 \div -6$	$(-4)^3$

I can do this

I need to work on this

# YEAR 9 TRACKING SHEET: CALCULATOR

Order from Smallest to Largest		6, 12, 21, 0, 8	2, -5, -3, -1, 5	0.2, 0.21, 0.02, 2.0, 0.202	$\frac{1}{2}, \frac{2}{3}, \frac{1}{3}, \frac{3}{5}, \frac{1}{6}$	$\frac{1}{3}, 0.25, 40\%, 0.3, \frac{2}{5}$
FRACTIONS	Manipulation Ex 7.1-7.5, 7.14-7.15		$\frac{2}{3} = \frac{?}{18}$	Simplify: $\frac{28}{42}$	Write $\frac{37}{5}$ as a mixed number	Write $4\frac{2}{3}$ as an improper fraction
	Calculations Ex 7.6-7.13 7.16-7.18	$\frac{1}{6}$ of 20	$\frac{1}{5} + \frac{2}{3}$	$\frac{2}{3} \div \frac{1}{9}$	$\frac{-3}{4} - \frac{1}{5}$	$2\frac{4}{5} \times 3\frac{1}{6}$
Decimals Chapter 2		$5.3 + 7.04$	$\frac{3}{5} =$	$36\% =$	$(12.43 \times 3.8) + 2.4$	$\frac{2.469 - 0.0043}{3.6}$
Percentages Chapter 8		Find 23% of 64	Find 15 out of 24 as a percent	Increase 650 by 15%	Decrease 925 by 4%	Find percentage change from 36 to 45
Rounding Ex 2.20, 2.21		Round to 2dp 34.5682	Round to 2dp 756.8406	Round to 2dp 65.4	Round to 2dp 0.5982	Round to 2sf 5.753
Powers Ex 5.1-5.6		$4^2$	$53^2$	$15^3$	$-6^4$	$25^{\frac{1}{2}}$
Roots Ex 5.7		$\sqrt{36}$	$\sqrt{7056}$	$\sqrt[3]{3375}$	$\sqrt[4]{4096}$	$\sqrt[3]{64^2}$
Standard Form Ex 2.11, 2.16		$12.3456 \times 100$	$314.637 \div 100$	$281.643 \times 0.01$	$2.4367 \times 10^2$	$3.631 \times 10^{-2}$

I need to work on this

I can do this