



**Clonard College**  
**MATHEMATICS PATHWAYS GUIDE**  
**2020**

*Imagining the future*  
*Helping girls choose maths*

$C_{17}H_{21}N_{03} + C_5H_9NO_4$

$1, 3, 5, 7, 9, 11, 13, 15, 17$

$E=MC^2$

$x = x_0 + v_0 t + \frac{1}{2}at^2$   
 $v_f = v_0 + at$   
 $M_g(NO_3)_2$

$R_{eq} = R_1 + R_2 + R_3 + \dots$

$L = L_0(1 + \alpha \Delta T)$

$y^2/a^2 - x^2/b^2 = 1$

$F = G m_1 m_2 / R^2$

A.  $10 \sin 5 2x + C$   
 B.  $10 \cos 5 2x + C$   
 C.  $5 \cos 5 2x + C$   
 D.  $10 \cos 5 2x + C$   
 E.  $1/10 \sin 5 2x + C$

# Summary of courses offered for 2020

## *JUNIOR MATHS CLASSES*

<b>Courses offered</b>	<b>Compulsory or elective</b>	<b>Notes</b>
<b>YEAR 7 Students</b> Year 7 Mathematics NLEP Year 7 Mathematics General Year 7 Mathematics Advanced	One stream of mathematics is compulsory for all students at this level.	Places in advanced or NLEP classes offered to students based on results from preliminary testing.  Students are reviewed at the end of each term and upon recommendation from a teacher can move between streams.
<b>Year 8 Students</b> Year 8 Mathematics NLEP Year 8 Mathematics General Year 8 Mathematics Advanced	One stream of mathematics is compulsory for all students at this level.	Places in advanced or NLEP classes offered to students based on results from the year before.  Students are reviewed at the end of each term and upon recommendation from a teacher can move between streams.
<b>Year 9 Students</b> Year 9 Mathematics NLEP Year 9 Mathematics General Year 9 Mathematics Advanced	One stream of mathematics is compulsory for all students at this level.	Places in advanced or NLEP classes offered to students based on results from the year before.  All students are reviewed at the end of each term and upon recommendation from a teacher can move between streams.  Students can also self-elect to enrol in Advanced classes, however this is reviewed, and students may be placed in classes based on their previous results and teacher's feedback.

<p><b>Year 10 Students</b></p> <p>Year 10 Mathematics Pre-Cal</p> <p>Year 10 Mathematics General</p> <p>Year 10 Mathematics Advanced</p>	<p>One stream of mathematics is compulsory for all students at this level.</p> <p>Students are not required to enrol in a mathematics course beyond Year 10, apart from VCAL</p>	<p>Places in advanced or NLEP classes offered to students based on results from the year before.</p> <p>All students are reviewed at the end of each term and upon recommendation from a teacher can move between streams. Students can also self-elect to enrol in Advanced classes, however this is reviewed and students may be placed in classes based on their previous results and teacher's feedback.</p>
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### **SENIOR MATHS CLASSES**

<p><b>Year 11 Students</b></p> <p>VCAL Numeracy (Foundation, Intermediate)</p> <p>Mathematics General 1 and 2</p> <p>Mathematics Methods 1 and 2</p> <p>Specialist Mathematics 1 and 2</p>	<p>VCAL Numeracy compulsory for VCAL students.</p> <p>Other streams of maths are electives</p>	<p>Students are advised to only enrol in Methods or Specialist after completing Year 10 Advanced Maths. Consideration of student grades and teacher feedback will be reviewed on a case by case basis in regard to suitable subject placement for those wanting or needing to enrol in Methods or Specialist.</p>
<p><b>Year 12 Students</b></p> <p>VCAL Numeracy (Foundation, Intermediate or Senior)</p> <p>Further Mathematics 3 and 4 (continuation of general mathematics 1 and 2)</p> <p>Mathematics Methods 3 and 4</p> <p>Specialist Mathematics 3 and 4</p>	<p>VCAL Numeracy compulsory for VCAL students.</p> <p>Other streams of maths are electives</p>	<p>Students are advised to only enrol in Methods or Specialist after completing Year 10 Advanced Maths.</p> <p>Year 9 students considering accelerating into 12 Further in year 10 are advised to discuss this with the 12 Further Mathematics Teachers and the Mathematics Learning Leader before they make any decisions to see if this is a suitable choice or not.</p>

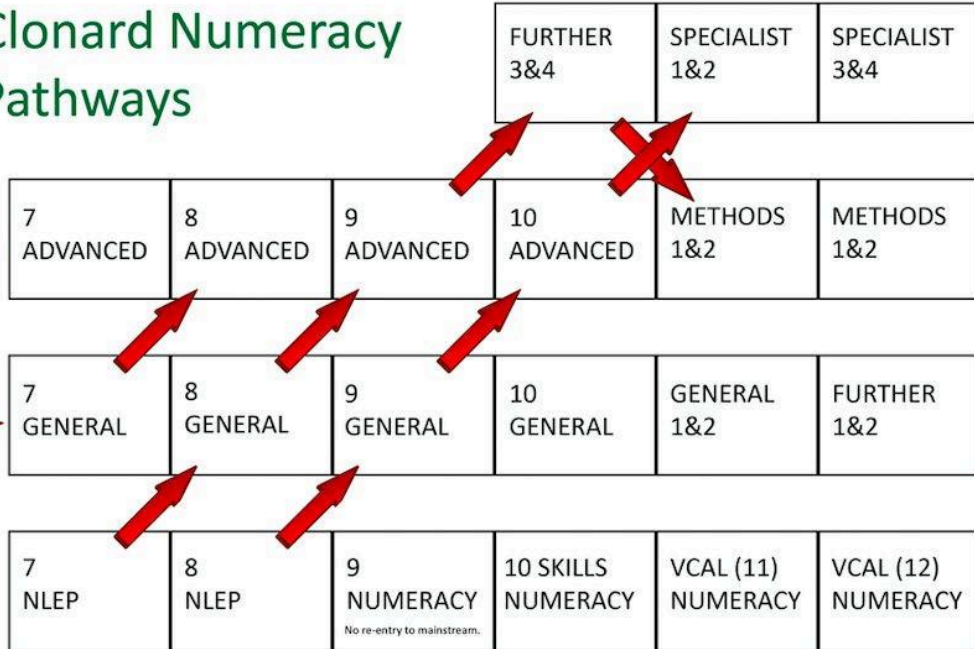
# Suggested Pathways into VCE Mathematics



## Clonard Numeracy Pathways

\* Intensive Calculator Workshop

Students will be selected for these classes based on their PAT Maths results, NAPLAN results and their Grade 6 reports.



### IMPORTANT CONSIDERATIONS:

Students may choose to elect more than one Mathematics subject in senior years if the timetable allows.  
 Students in junior years can shift between streamed classes – this process involves teachers reviewing student’s needs and progress.  
 This will be viewed at the end of each term.

## Process for moving between NLEP, Mainstream and Advanced Classes (Year 7-9) or

Students can be moved or make a move between streams in Years 7-9 for many different reasons. Movement between streams is ideally finalised at the end of a term or year and actioned for the beginning of a term or year to ensure minimal impact on the student's learning and timetable for all subjects. However, in certain situations students may be moved within a term if warranted. The following is an outline of the process that takes place for a student to move.

1. A Mathematics Teacher identifies a student who they believe should move to another stream and notifies the student's parent/guardian of this. Or a student and/or parent/guardian request a move by making contact with the student's Mathematics Teacher. The Mathematics Learning Leader is notified of this request.
2. The student's teacher and the Mathematics Learning Leader will discuss if the move is warranted and the best suited stream to move into. If the student is moving between NLEP and Mainstream this discussion will involve either Julie Perry or Kylie Power. If a student is moving between streams both grades and performance will be taken into consideration.
3. The College Timetable Administrator is notified of the requested move so all involved can be informed of any possible changes to the student's timetable or other subjects.
4. Either the Mathematics Teacher or Mathematics Learning Leader will contact the parent/guardian to confirm the move. The student will be involved in this process. **Only at this point are parents contacted to give permission, no move will be guaranteed before this point.** If the parent and student agree to the move it will be actioned from this point.
5. The College Timetable Administrator is notified of the confirmation of the move and actions this to occur for the requested time.
6. All subject teachers and the student involved in this move will be informed and the student will be moved at the beginning of a new term or at the most reasonable time.

## Clonard Mathematics Experts

The following Clonard teachers are always available to assist you in your planning and decision making:

- Mr Patrick Dwyer – Learning Leader Mathematics
- Mrs Emma Rhodes – Mathematics Teacher (Methods teacher)
- Mr Ben Hughson – Mathematics Teacher (Specialist Mathematics teacher)
- Mrs Ashlee Milne – Mathematics Teacher (Methods and Further teacher)
- Mrs Carmel Brown - Mathematics Teacher
- Miss Shelby Hackett - Mathematics Teacher (NLEP Teacher)
- Mr Ian Callahan - Mathematics Teacher (Methods and Further teacher)
- Ms Gabrielle Blythe - Mathematics Teacher
- Mr Dan Madden – Mathematics Teacher
- Mr Ryan Healy – Mathematics Teacher
- Mr Lance Houlihan – Mathematics Teacher (NLEP Teacher)
- Mr Hugh Saunders – Mathematics Teacher
- Ms Rachael Congues – Mathematics Teacher
- Ms Cathy Wilson – Mathematics Teacher (NLEP Teacher)

## Mathematics Unit Overviews

For detailed descriptors of VCE Mathematics units please see the TRUE NORTH website available via PAM.



**“Have you considered a career with maths?”  
LOVE MATHS? HAVE YOU THOUGHT ABOUT  
THE FOLLOWING CAREERS?**

SHAPE UP WITH **MATHS**

**LEVEL 1**

**ACCESSIBLE THROUGH  
YEAR 12 COMPLETION  
OR CERTIFICATE I / II**

**BANK TELLER BARTENDER DEBT  
COLLECTOR HOSPITALITY WORKER  
INSURANCE AGENT PAYROLL OFFICER  
RETAIL BUYER SALES ASSISTANT  
TRADES ASSISTANT**

**LEVEL 2**

**ACCESSIBLE THROUGH  
DIPLOMA OR CERTIFICATE III / IV**

**AIRCRAFT MAINTENANCE ENGINEER  
DRAFTSPERSON BIOMEDICAL TECHNICIAN  
CONSTRUCTION MANAGER CARTOGRAPHER  
CIVIL ENGINEERING TECHNICIAN COMPUTER  
TECHNICIAN DATA PROCESSOR ELECTRICIAN  
INSURANCE CLERK LABORATORY WORKER  
LINE MECHANIC MECHANICAL TECHNICIAN  
PERSONAL TRAINER PROCUREMENT MANAGER  
PRODUCTION MANAGER TELCO ENGINEER**

**AND STATS**

**LEVEL 3**

**ACCESSIBLE THROUGH  
BACHELOR DEGREE**

**ACCOUNTANT AIR TRAFFIC CONTROL  
ANALYST BIOTECHNICIAN BUSINESS  
ANALYST COMPUTER SYSTEMS ANALYST  
COMMERCIAL UNDERWRITER  
CRYPTOLOGIST DATA ANALYST  
ECOLOGIST GAME DESIGNER INDUSTRIAL  
DESIGNER INSIGHTS ANALYST MARINE  
SURVEYOR MARKET RESEARCH ANALYST  
METEOROLOGIST NURSE OPTOMETRIST  
PHARMACIST PHARMACOLOGIST PILOT  
QUANTITY SURVEYOR SOFTWARE ENGINEER  
SYSTEMS ANALYST TEACHER VETERINARIAN  
WEB ANALYST WEB DEVELOPER**

**LEVEL 4**

**ACCESSIBLE THROUGH  
BACHELOR DEGREE &  
POSTGRADUATE**

**ACTUARY AERONAUTICAL ENGINEER  
ARCHITECT AUDITOR ASTROPHYSICIST  
BIOINFORMATICIAN BIOMEDICAL ENGINEER  
BIOSTATISTICIAN CHEMICAL ENGINEER CIVIL  
ENGINEER DATA SCIENTIST ECONOMIST  
ELECTRICAL ENGINEER ENVIRONMENTAL  
ENGINEER FINANCIAL ANALYST GEOLOGIST  
GEOMATICS ENGINEER GEOPHYSICIST  
GEOSPATIAL SPECIALIST MECHANICAL  
ENGINEER MARINE ENGINEER  
MATHEMATICIAN METEOROLOGIST MINING  
ENGINEER NAVAL ARCHITECT OPERATIONS  
RESEARCH ANALYST PHYSICIST QUANTITATIVE  
ANALYST RESEARCH SCIENTIST RISK  
ANALYST ROBOTICS ENGINEER STATISTICIAN  
UNIVERSITY LECTURER**

# NEED MORE IDEAS? COULD THIS BE YOU?

## JOB KEYWORDS

MINING - ENGINEERING - ENERGY - ANALYTICS - PROBLEM SOLVING  
DATA SCIENCE - DATA ANALYTICS - MODELLING - ENERGY - UTILITIES  
OPTIMISATION - FORECASTING - PLANNING - STATISTICS - MATHEMATICS

## CAT PHILLIPS

### SUPPLY PLANNER, EXXON MOBIL

I help keep the lights on, literally. I'm part of the team using maths to make sure Victorians have enough gas to power homes and industry today, tomorrow and into the future.

“A turning point for me was maths in Year 11... It instilled in me a curiosity about how things work and led to me studying science and mathematics at university, followed by a Master of Mechanical Engineering.”

When I studied maths at university, I worried I'd be stuck in a job where I'd be sitting by myself at a computer all day. But that's definitely not the case. My job involves communication and maths, two completely different skill sets that I love.

If you aren't sure what you want to do – don't worry. Just keep your options open for as long as you can and keep your eyes open for exciting opportunities! You never know how things might change or where you might end up wanting to work.

*Cat is a careers ambassador for AMSI's Choose Maths project*





## JOB KEYWORDS

ACCOUNTING - BANKING - INSURANCE - ECONOMICS - DATA ANALYTICS  
MODELLING - OPTIMISATION - RISK ANALYSIS - INVESTMENT  
STATISTICS - QUANTITATIVE ANALYST - NUMERICAL ANALYSIS

# STEPHANIE PARSONS

## ECONOMIST, RESERVE BANK OF AUSTRALIA

Whether you realise it or not, the economy impacts everyone.

Most people know that the Reserve Bank of Australia (RBA) is responsible for setting the official cash rate in Australia, mainly because interest rates are so often in the news. But many people don't realise that the RBA has other responsibilities. For example, we have people working to maintain a strong and stable financial system, promote payments system efficiency, provide banking services to the government and produce Australia's banknotes.

I currently work in the area that is responsible for producing Australia's banknotes. I'd love to say that I make the money – but my team's role is actually to provide analytical insights to ensure that the RBA's policies for managing the nation's banknotes are effective.

“Like many economists, I stumbled upon economics when I was at university. You never really know where you might end up so it's always good to keep your options open and go to your economics lectures.”

*Stephanie is a careers ambassador for AMSI's Choose Maths project.*



# WENDY EWING

## ASSISTANT DEPUTY DIRECTOR OF PHARMACY, MONASH HEALTH

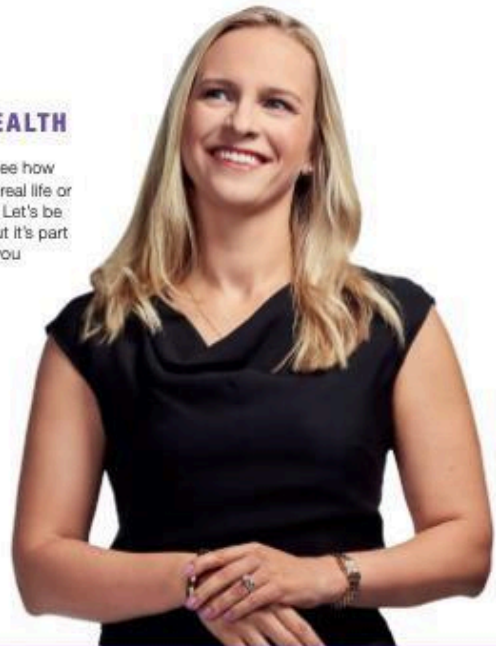
“My Year 12 maths teacher used to say that “maths makes sense”. This resonates with me – there's always an answer when maths is involved.”

Maths is involved in all aspects of medication use: how we determine the appropriate dose to give to a patient, how to determine how well a patient's liver and kidneys are functioning, and how long a medication will be in a patient's body.

I'm responsible for medication safety across Monash Health. Medicines are the most common treatment that patients receive in hospital. They can be very effective, but an error can have major consequences. My role involves governance and responsibility of medication safety initiatives to improve the way medicines are prescribed, dispensed, stored and administered, with an overall aim of improving patient safety. The work that I oversee aims to reduce medication errors that harm patients.

At school it can be tough to see how your subjects will translate to real life or to a future career path or job. Let's be honest, not everything will. But it's part of a journey to find out what you like and what you're good at.

*Wendy is a careers ambassador for AMSI's Choose Maths project.*



## JOB KEYWORDS

FORENSICS - FRAUD - CRIMINOLOGY - DATA ANALYTICS - MODELLING  
DEFENCE - LOGISTICS - RISK ANALYSIS - INFORMATICS

# PUXUE QIAO

## INTERN, EPSILON SECURITY

As changing lifestyles and demographics of urban populations fuel the rapid growth of high-density housing, understanding factors influencing the risk of crime occurrence in such buildings has become a vital tool for law enforcers.

To tackle this problem, Epsilon Security teamed up with APR.Intern to place postgraduate student, Puxue Qiao, and statistician Dr Davide Ferrari from The University of Melbourne, to establish a standard method in evaluating building crime rates through modelling which assesses property risk and identifies safety solutions.

“ The main concern is the lack of a standard method to evaluate security levels of buildings for comparisons. To do this we needed to develop a data-driven computer model to assess the security risk and potential crime exposure of a building. ”

Puxue worked with Epsilon Security to build a generalised mixed-effect model, allowing them to make predictions of crime occurrences, whilst obtaining security ratings for each individual building.

The success of this project led the Epsilon Security team to apply for an ARC Linkage Projects grant to continue their work, with the objective of developing a fully automated tool for risk ratings in buildings.

*Australian Postgraduate Research (APR) Intern is the only national all-sector all-discipline internship program placing PhD students into business. A not-for-profit program, APR.Intern is driving innovation and accelerating women in STEM through short-term industry and university research collaborations.*

