

**Dare, Connect, Learn.**

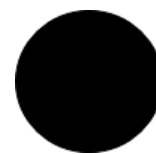
William Ruthven  
Secondary College  
Pathways

2023

# VCE Course Selection Handbook



**WILLIAM RUTHVEN  
SECONDARY COLLEGE**



## Principal's Message

To our current and future Senior School students;



It is with a sense of privilege that I

Welcome you to your senior years of secondary education. This is what you have been working towards and I look forward to continuing to support you on your individual journeys into your adult lives.

Please take the time to read through your options, speak with your teachers, the College career advisor and your families to choose a pathway that suits you. We are here to support you to make good, sustainable decisions so that you can experience success.

Whichever pathway you choose my advice is to always stay interested and motivated. You will learn a lot in your senior years of education, some of that will happen in the classroom but you will also learn a lot about who you are and the kind of adult you want to be. Know that we are always here to support you.

Andrew Elborough  
Principal

## Core Values



**Leadership:** Encouraging all students to see themselves as self-motivated, independent learners in all aspects of their lives. Encouraging all students to seek wonder and inquire into the world around them.



**Excellence:** All members of the college community pursue excellence and take responsibility for learning and achieving their full potential.



**Acceptance:** All members of the College community value diversity as a strength and cultivate an openness of mind. All members work collaboratively in teams and develop the skills to solve new problems. Acceptance also builds on encouraging a safe, orderly learning environment based around positive relationships.



**Respect:** All members of the College community cultivate mutual respect, responsibility, integrity and respect for learning.

## Key Contacts

**Pauline Pearson**

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**Assistant Principal**



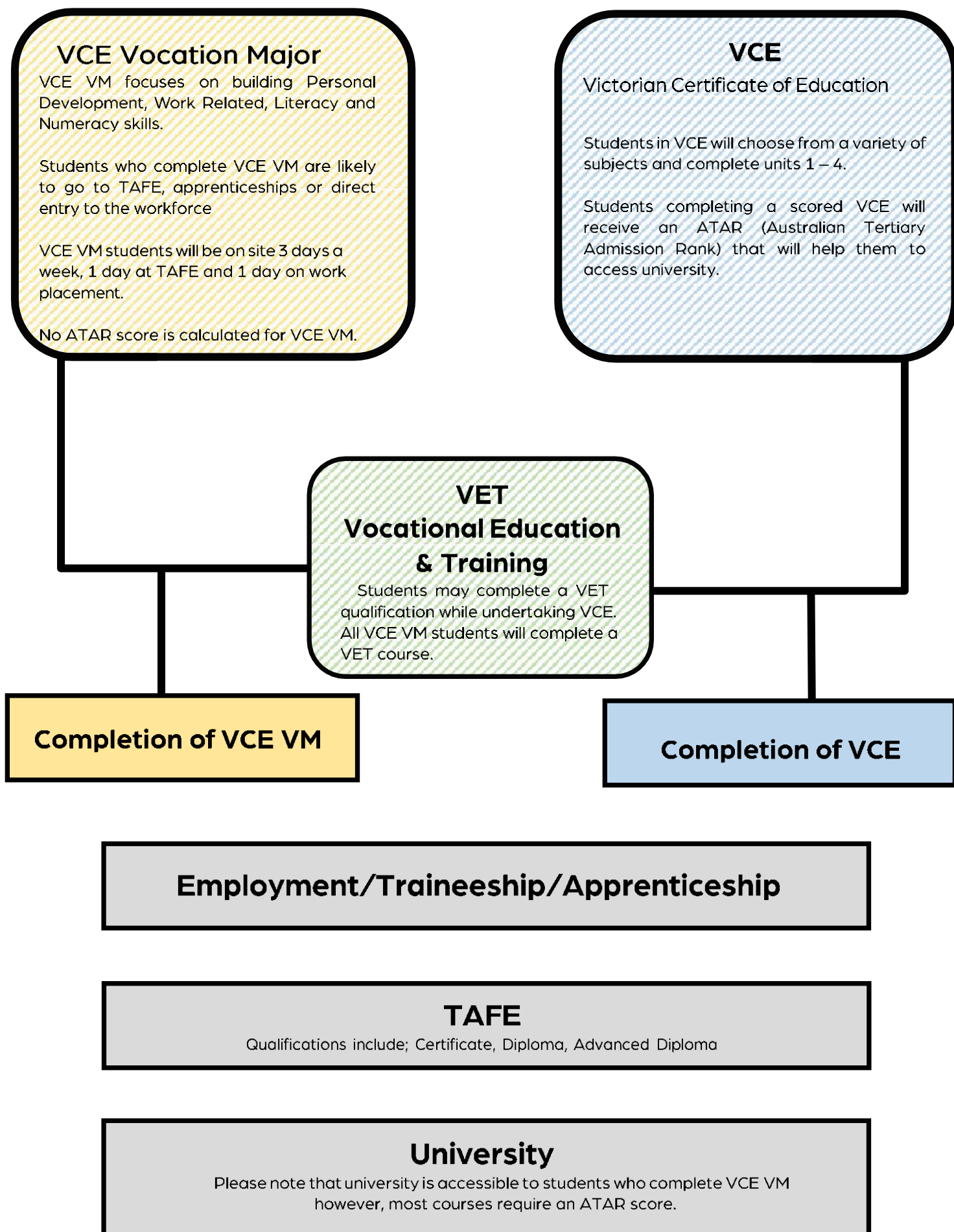
**Brett Ormrod**

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**Senior School Leader**



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## Success in VCE

At William Ruthven Secondary College there are 2 main ways students usually achieve success;

Option A: Complete 6 Unit 1&2 subjects in year 11 and 5 Unit 3&4 subjects in year 12.

	Year 11	Year 12
Unit 1&2	6 subjects	
Unit 3&4		5 subjects

Option B: Complete a Unit 1&2 subject in year 10, a Unit 3&4 subject in year 11 with 5 Unit 1&2 subjects, and finally complete 5 unit 3&4 subjects in year 12.

	Year 10	Year 11	Year 12
Unit 1&2	1 subject	5 subjects	
Unit 3&4		1 subject	5 subjects

Students who choose to complete an accelerated VCE subject in Yr11 do so under the proviso that they will repeat the subject in Yr12 for an improved study score.

## Minimum Requirements

- 16 Units in total
- 3 units of English, EAL or Literacy (Units 3 & 4 must be completed for a scored VCE)
- 3 other unit 3 & 4 sequences

## Assessment

SAC School Assessed Coursework	SAT School Assessed Task	GAT General Achievement Test	Exams
All subjects will have SACs	Some subjects have SATs (usually in the form of a folio)	Units 3&4 only	Units 3&4 only
Coursework opportunities – these are predetermined learning tasks that students complete under supervision in order to demonstrate the VCAA outcomes for each subject			
Assessed by the teacher		Assessed by VCAA Examiners	
These take place throughout the year and you will receive a calendar each term of your SAC dates.		Held in June	Held at the end of the year

**SAC/SAT Scores + Exam = ATAR**

## Vocational Education and Training (VET)

- VET can be done alongside VCE
- Usually a 2 year course that you begin in year 11
- At the end of the course you will have your VCE and also a nationally recognised vocational qualification

### Where do I go for a VET course?

There are different places you can go for VET. Usually based at a TAFE. Outer Northern Trade Training Centre (ONTTC), Northern College of the Arts and Technology (NCAT), Kangan Institute and Peter Lalor Vocational College are places students commonly go to for VET. There are many locations though.

### When do I go?

Each year the VET Handbook publishes course, days and times. You will usually miss out on a half or whole day at school. This can be challenge. It is up to you to catch up on any missed classwork to make sure you don't fall behind. Your classroom teacher will help you figure out a strategy to support you to not fall behind.

### What are the benefits of completing a VET course?

- Can help prepare you for the workforce
- If you have a clear plan for what you would like to do in your career it is the starting point to achieving this
- **Some** VET courses can contribute to your ATAR

## Subject Selection & Prerequisite Subject

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When choosing your subjects you need to think ahead. Have a look at websites to find out if there are any prerequisite subjects for the course you want to do when you finish school.

- All courses require that you do English, EAL or Literature.
- Some courses require a science and/or math subject.
- Some courses require a folio interview, if you are interested in a course that needs a folio you will need to do an arts subject.

**For information on entry into tertiary courses and pre-requisites please go to the VTAC Website:**

**<https://www.vtac.edu.au>**

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## Subjects offered in 2023

Please note that this is dependent on student enrolments. If a subject is not offered in 2023 that you would like to take part in you may still be able to enroll through Virtual Schools Victoria.

### Health & Physical Education

Health & Human  
Development  
Outdoor & Environmental  
Studies  
Physical Education

### VCE Vocational Major

Literacy  
Numeracy  
Personal Development Skills  
Work Related Skills  
VET  
Work Placement

### Mathematics

General Maths  
Maths Methods  
Specialist Maths

### Science

Biology  
Chemistry  
Psychology  
Physics

### English

English  
EAL  
Literature

### Humanities

Accounting  
Business Management  
History  
Legal Studies

### Technologies

Food Studies  
Computing  
Units 1&2 Applied  
Computing  
Units 3&4 Software  
Development

### Arts

Art Creative Practice  
Visual Communication &  
Design



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## Subject descriptions

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The remainder of this booklet contains descriptions of the units, from which Year 11 and 12 students may select for 2023.

These descriptions outline the outcomes and assessments required to satisfy the Victorian Certificate of Education (VCE) & VCE VM (Vocational Major) as prescribed by the Victorian Curriculum and Assessment Authority (VCAA).

Please read the information carefully and ask for explanations where required.

At William Ruthven Secondary College, we strive to provide the best educational and vocational pathways for our students. We encourage all students to choose subjects that will help them to achieve their goals and of course we expect them to do their best.

Please contact the school if you would like any help with understanding the contents of this booklet.

## VCE VM – Vocational Major

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### VCE VM Structure

The VCE VM is made up of the following core subjects:

Work Related Skills Units 1–4
Personal Development Skills Units 1–4
Literacy Units 1–4
Numeracy Units 1–4
VET Units 1–4
Work Placement

Students attend school three days per week and complete one day of VET studies and one day of Work Placement each week.

Students will have the opportunity to apply the knowledge and skills gained from this study in the classroom environment and through Structured Workplace Learning (SWL).

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## **Work Related Skills (WRS) Units 1–4**

VCE Vocational Major Work Related Skills (WRS) examines a range of skills, knowledge and capabilities relevant to achieving individual career and educational goals. Students will develop a broad understanding of workplace environments and the future of work and education, in order to engage in theoretical and practical planning and decision-making for a successful transition to their desired pathway.

The study considers four key areas: the future of work; workplace skills and capabilities; industrial relations and the workplace environment and practice; and the development of a personal portfolio.

Students will have the opportunity to apply the knowledge and skills gained from this study in the classroom environment and through Structured Workplace Learning (SWL).

## **Personal Development Skills (PDS) Units 1–4**

VCE Vocational Major Personal Development Skills (PDS) takes an active approach to personal development, self-realisation and citizenship by exploring interrelationships between individuals and communities. PDS focuses on health, wellbeing, community engagement and social sciences, and provides a framework through which students seek to understand and optimise their potential as individuals and as members of their community.

This study provides opportunities for students to explore influences on identity, set and achieve personal goals, interact positively with diverse communities, and identify and respond to challenges. Students will develop skills in self-knowledge and care, accessing reliable information, teamwork, and identifying their goals and future pathways.

PDS explores concepts of effective leadership, self-management, project planning and teamwork to support students to engage in their work, community and personal environments. Through self-reflection, independent research, critical and creative thinking and collaborative action, students will extend their capacity to understand and connect with the world they live in, and build their potential to be resilient, capable citizens.

## **VM Literacy Units 1–4**

VCE Vocational Major Literacy focuses on the development of the knowledge and skills required to be literate in Australia today. The key knowledge and key skills encompass a student's ability to interpret and create texts that have purpose, and are accurate and effective, with confidence and fluency.

Texts should be drawn from a wide range of contexts and be focused on participating in the workplace and community. Further to this, texts should be drawn from a range of sources including media texts, multimodal texts, texts used in daily interactions, and workplace texts from increasingly complex and unfamiliar settings.

As students develop these skills, they engage with texts that encompass the everyday language of personal experience to the more abstract, specialised and technical language of different workplaces, including the language of further study. The applied learning approach of this study is intended to meet the needs of students with a wide range of abilities and aspirations.

## **VM Numeracy Units 1–4**

VCE Vocational Major Numeracy focuses on enabling students to develop and enhance their numeracy skills to make sense of their personal, public and vocational lives. Students develop mathematical skills with consideration of their local, national and global environments and contexts, and an awareness and use of appropriate technologies.

This study allows students to explore the underpinning mathematical knowledge of number and quantity, measurement, shape, dimensions and directions, data and chance, the understanding and use of systems and processes, and mathematical relationships and thinking. This mathematical knowledge is then applied to tasks which are part of the students' daily routines and practices, but also extends to applications outside the immediate personal environment, such as the workplace and community.

The contexts are the starting point and the focus, and are framed in terms of personal, financial, civic, health, recreational and vocational classifications. These numeracies are developed using a problem-solving cycle with four components: formulating; acting on and using mathematics; evaluating and reflecting; and communicating and reporting.



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## **VET (Vocational Education & Training)**

To successfully complete your VCE VM certificate at year 12, you will need to include a course of study from the TAFE sector. You can begin the VET course in year 11. All VET studies available are listed in the Northern Melbourne VET Cluster Handbook.

Course descriptions and costs may vary depending on departmental policies and funding. Generally, VET courses cost around \$200 per year, depending on the course chosen. Courses will run depending on student numbers.

## **School based apprenticeships**

School-based Part-Time Traineeships/Apprenticeships allow students to train and get paid work while completing their Senior School and TAFE studies.

These studies will satisfy the industry specific strand in the VCE VM programs. The benefits for students are:

VCE VM certificate as well as a TAFE qualification, paid employment for the time spent at work, formal training with a TAFE College and a work history.

A range of traineeships is available and students will be supported by the school where they wish to access them.

The areas available include: Retail Operations, Horticulture, Office Administration, Information Technology, Automotive, Hairdressing, Hospitality, Business

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**Units 1 & 2**



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## Accounting

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### Unit 1: Role of accounting in business

This unit explores the establishment of a business and the role of accounting in the determination of business success or failure. In this, it considers the importance of accounting information to stakeholders. Students analyse, interpret and evaluate the performance of the business using financial and non-financial information. They use these evaluations to make recommendations regarding the suitability of a business as an investment. Students record financial data and prepare reports for service businesses owned by sole proprietors.

**Outcome 1:** On completion of this unit the student should be able to describe the resources required to establish and operate a business, and select and use accounting reports and other information to discuss the success or otherwise of the business.

**Outcome 2:** On completion of this unit the student should be able to identify and record financial data, report and explain accounting information for a service business, and suggest and apply appropriate financial and non-financial indicators to measure business performance

### Unit 2: Accounting and decision-making for a trading business

In this unit students develop their knowledge of the accounting process for sole proprietors operating a trading business, with a focus on inventory, accounts receivable, accounts payable and non-current assets. Students use manual processes and ICT, including spreadsheets, to prepare historical and budgeted accounting reports. Students analyse and evaluate the performance of the business relating to inventory, accounts receivable, accounts payable and non-current assets. They use relevant financial and other information to predict, budget and compare the potential effects of alternative strategies on the performance of the business. Using these evaluations, students develop and suggest to the owner strategies to improve business performance.

**Outcome 1:** On completion of this unit the student should be able to record and report for inventory and discuss the effect of relevant financial and non-financial factors, and ethical considerations, on the outcome of business decisions.

**Outcome 2:** On completion of this unit the student should be able to record and report for accounts receivable and accounts payable, and analyse and discuss the effect of relevant decisions on the performance of the business including the influence of ethical considerations.

**Outcome 3:** On completion of this unit the student should be able to record and report for non-current assets and depreciation



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## **Art Creative Practice**

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### **Unit 1**

In Unit 1 students use Experiential learning in Making and Responding to explore ideas using the Creative Practice. As the artist and audience, students consider their connection to artworks, and how their communication of ideas and presentation of artworks challenge, shape and influence viewer or audience perspectives. They focus on the making of art and examine how artists communicate ideas and meaning in artworks. They examine artists in different societies, cultures and historical periods and develop their own interpretations and viewpoints about the meanings and messages of artworks. They explore how artists create new ways of thinking and representation, while developing their own art practice.

Area of Study 1- Artists, artworks and audiences

Area of Study 2- The Creative Practice

Area of Study 3- Documenting and reflecting on the Creative Practice

### **Unit 2**

In Unit 2 students use Inquiry learning to investigate the artistic and collaborative practices of artists. They use the Cultural Lens, and the other Interpretive Lenses as appropriate, to examine artworks from different periods of time and cultures, and to explore the different ways that artists interpret and communicate social and personal ideas in artworks. Students explore the collaborative practices of artists and use the Creative Practice to make and present artworks. They develop visual responses based on their investigations, exploring the way historical and contemporary cultural contexts, ideas and approaches have influenced the artworks and the practices of the artists they investigate, as well as their own art practice. Artworks can acknowledge specific ideas or beliefs, or commemorate people, institutions, social movements and events. They can reinforce the intentions and purpose of a social, cultural or community group, or they can challenge social or cultural attitudes and assumptions.

Area of Study 1- The artist, society and culture

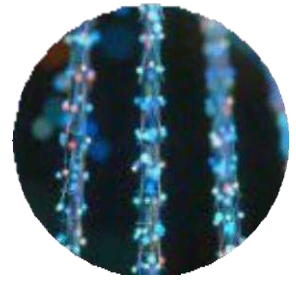
Area of Study 2- The collaborative Creative Practice

Area of Study 3- Documentation of collaboration using the Creative Practice





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## **Biology**

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Unit 1: How do living things stay alive?

In this unit students are introduced to some of the challenges to an organism in sustaining life. Students examine the cell as the structural and functional unit of life, from the single celled to the multicellular organism, and the requirements for sustaining cellular processes in terms of inputs and outputs. They analyse types of adaptations that enhance the organism's survival in a particular environment and consider the role homeostatic mechanisms play in maintaining the internal environment. Students investigate how a diverse group of organisms form a living interconnected community that is adapted to, and utilises, the abiotic resources of its habitat.

Area of study 1

How do organisms function?

Area of Study 2

How do living systems sustain life?

Area of Study 3

Practical investigation

Unit 2: How is continuity of life maintained?

In this unit students focus on cell reproduction and the transmission of biological information from generation to generation. Students learn that all cells are derived from pre-existing cells through the cell cycle. They examine the process of DNA replication and compare cell division in both prokaryotic and eukaryotic organisms. Students explore the mechanisms of asexual and sexual reproductive strategies, and consider the advantages and disadvantages of these two types of reproduction. The role of stem cells in the differentiation, growth, repair and replacement of cells in humans is examined, and their potential use in medical therapies is considered.

Area of Study 1

How does reproduction maintain the continuity of life?

Area of Study 2

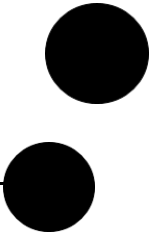
How is inheritance explained?

Area of Study 3

How do humans use science to explore and communicate contemporary bioethical issues?



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# **Business Management**

Business management is the study of concepts, which apply to the management of businesses. It examines the ways in which people at various levels within a business organisation manage resources to achieve business objectives. Students develop an understanding of the challenges, complexity and rewards that come from business management and gain insight into the various ways resources can be managed in businesses whether they be small partnership businesses or large public companies.

## Unit 1: Planning a Business

Businesses of all sizes are major contributors to the economic and social wellbeing of a nation. How businesses are formed and the fostering of conditions under which new business ideas can emerge are vital for a nation's wellbeing. Taking a business idea and planning how to make it a reality are the cornerstones of economic and social development. In this unit students explore the factors affecting business ideas and the internal and external environments within which businesses operate, and the effect of these on planning a business.

The three topic areas are:

- Business Idea
- Internal Environment
- External Environment

## Unit 2: Establishing a Business

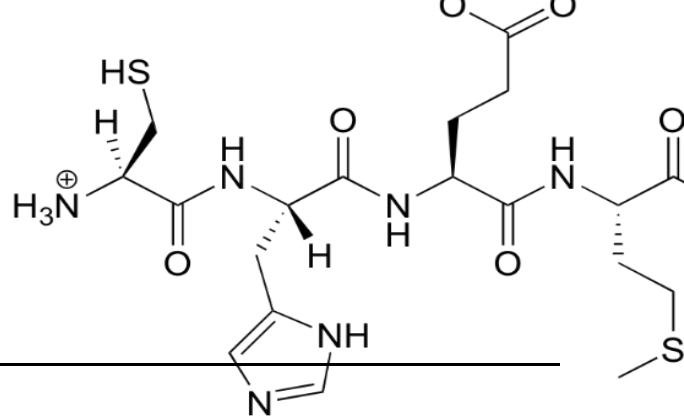
This unit focuses on the establishment phase of a business's life. Establishing a business involves complying with legal requirements as well as making decisions about how best to establish a system of financial record keeping, staff the business and establish a customer base. In this unit students examine the legal requirements that must be satisfied to establish a business. They investigate the essential features of effective marketing and consider the best way to meet the needs of the business in terms of staffing and financial record keeping. Students analyse various management practices in this area by applying this knowledge to contemporary business case studies from the past four years.

The three topic areas are:

- Legal and Financial considerations
- Marketing a business
- Staffing a business







## Chemistry

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### Unit 1

In this unit students investigate the chemical structures and properties of a range of materials, including covalent compounds, metals, ionic compounds and polymers. They are introduced to ways that chemical quantities are measured.

**Area of Study 1: How do the chemical structures of material explain their properties and reactions?**

In this area of study students investigate the structures, properties and reactions of carbon compounds, metals and ionic compounds, and use chromatography to separate the components of mixtures.

**Area of Study 2: How are materials quantified and classified?**

In this area of study students focus on the measurement of quantities in chemistry and the structures and properties of organic compounds, including polymers.

**Area of Study 3: How can chemical principles be applied to create a more sustainable future?**

In this area of study students undertake an investigation involving the selection and evaluation of a recent discovery, innovation, advance, case study, issue or challenge.

### Unit 2

In this unit students analyse and compare different substances dissolved in water and the gases that may be produced in chemical reactions. They explore applications of acid-base and redox reactions in society.

**Area of Study 1: How do chemicals interact with water?**

In this area of study students explore water's properties, including its density, specific heat capacity and latent heat of vaporisation.

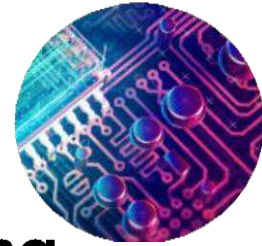
**Area of Study 2: How are chemicals measured and analysed?**

In this area of study students measure the solubility of substances in water, explore the relationship between solubility and temperature using solubility curves, and learn to predict when a solute will dissolve or crystallise out of solution.

**Area of Study 3: How do quantitative scientific investigations develop our understanding of chemical reactions?**

In this area of study students adapt or design and then conduct a scientific investigation related to chemical equations and/or analysis, which must include the generation of primary data.





## Computing: Applied Computing

### Unit 1

In this unit students focus on how data, information and networked digital systems can be used to meet a range of users' current and future needs.

Areas of study:

**Data and graphic solutions:** students collect primary data and create a digital solution that graphically presents the findings of the investigation.

**Networks:** students examine the technical underpinnings of wireless and mobile networks, and security controls to protect stored and transmitted data, to design a network solution that meets an identified need or opportunity. They predict the impact on users if the network solution were implemented.

**Collaboration and communication:** students acquire and apply their knowledge of information architecture and user interfaces, together with web authoring skills, to present different viewpoints on a contemporary issue.

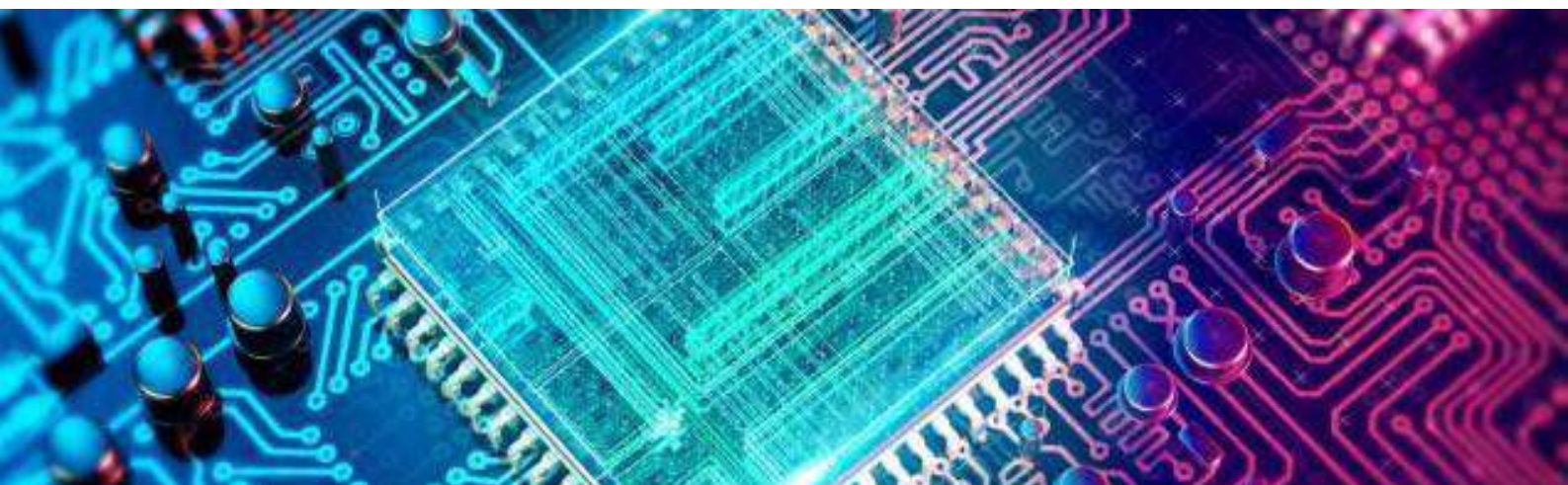
### Unit 2

In this unit students focus on data and how the application of computational, design and systems thinking skills support the creation of solutions that automate the processing of data. Areas of Study:

**Programming:** students develop their computational thinking skills when using a programming or scripting language to create solutions. They engage in the design and development stages of the problem-solving methodology.

**Data analysis and visualisation:** students develop a sound understanding of data and how a range of software tools can be used to extract data from large repositories and manipulate it to create visualisations that are clear, usable and attractive, and reduce the complexity of data.

**Data management:** students apply all stages of the problem-solving methodology to create a solution using database management software and explain how they are personally affected by their interactions with a database system.





## English

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### Unit 1

In this area of study, students engage in reading and viewing texts with a focus on personal connections with the story. Students will plan and develop personal and analytical writing about a text, including the use of appropriate metalanguage to discuss vocabulary, text structures and language features.

The student should be able to demonstrate an understanding of effective and cohesive writing through the crafting of their own texts designed for a specific context and audience to achieve a stated purpose; and to describe individual decisions made about the vocabulary, text structures, language features and conventions used during writing processes.

### Unit 2

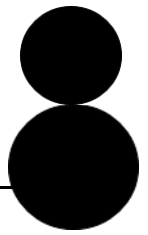
For this unit students are required to demonstrate two outcomes. These outcomes encompass the areas of study in the unit.

Suitable tasks for assessment in this unit include a combination of:

- an analytical response to a set text
- a set of annotated persuasive texts (including visual texts) that identify arguments, vocabulary, text structures and language features
- an analysis of the use of argument and persuasive language and techniques in text(s)
- an oral presentation of a point of view text.







## English as an Additional Language

### Unit 1

In Area of study 1, students engage in reading and viewing texts with a focus on personal connections with the story. Students will plan and develop personal and analytical writing about a text, including the use of appropriate metalanguage to discuss vocabulary, text structures and language features.

On completion of this unit the student should be able to make personal connections with, and identify selected vocabulary, text structures, language features and ideas in, a text.

In Area of study 2, students engage with and develop an understanding of effective and cohesive writing. They apply, extend and challenge their understanding and use of imaginative, persuasive and informative text through a growing awareness of situated contexts, stated purposes and audience.

Suitable tasks for assessment in this unit may be selected from the following:

- a personal response to a set text
- a note-form summary of key connections and ideas within the set text
- two student-created texts such as: short stories, speeches (with transcripts), essays (comment, opinion, reflective, personal), podcasts (with transcripts), poetry/songs, feature articles (including a series of blog postings) and memoirs
- a set of annotations on the student-created texts, identifying the qualities of effective writing.

### Unit 2

In Area of study 1, students develop their reading and viewing skills, including deepening their capacity for inferential reading and viewing, to further open possible meanings in a text, and to extend their writing in response to text.

In Area of study 2, students consider the way arguments are developed and delivered in many forms of media. Through the prism of a contemporary and substantial local and/or national issue, students read, view and listen to a range of texts that attempt to position an intended audience in a particular context. They explore the structure of these texts, including contention, sequence of arguments, use of supporting evidence and persuasive strategies. They closely examine the language and the visuals employed by the author, and offer analysis of the intended effect on the audience. Students apply their knowledge of argument to create a point of view text for oral presentation.

For this unit students are required to demonstrate two outcomes. As a set these outcomes encompass the areas of study in the unit.

Suitable tasks for assessment in this unit include a combination of:

- detailed mind map of vocabulary, text structures, language features and ideas from the set text
- an analytical response to a set text
- note-form summary of the key argument(s) and supporting arguments in persuasive text(s)
- an annotated visual text(s) that identifies the key persuasive techniques
- an analysis of the use of argument and persuasive language and techniques in text(s)
- an oral presentation of a point of view text.





## Food Studies

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### Unit 1 – Food Origins

This unit focuses on food from historical and cultural perspectives. Students investigate the origins and roles of food through time and across the world.

#### Area of study 1 Food around the World

In this area of study students explore the origins and cultural roles of food, from early civilisations through to today's industrialised and global world.

Outcome 1: Students should be able to identify and explain major factors in the development of a globalised food supply, and demonstrate adaptations of selected food from earlier cuisines through practical activities.

#### Area of Study 2 Food in Australia

In this area of study students focus on the history and culture of food in Australia.

Outcome 2: Students should be able to describe patterns of change in Australia's food industries and cultures, and use foods indigenous to Australia and those introduced through migration in the preparation of food products.

### Unit 2 – Food makers

In this unit students investigate food systems in contemporary Australia.

#### Area of Study 1

##### Australia's food systems

In this area of study students focus on commercial food production in Australia, encompassing components of the food systems that include primary food production, processing and packaging, distribution and access through the retail and food service sectors, media and marketing, consumption and waste management.

##### Outcome 1

On completion of this unit the student should be able to analyse relationships, opportunities and challenges within Australia's food systems, and respond to a design brief that produces a food product and demonstrates the application of commercial food production principles.

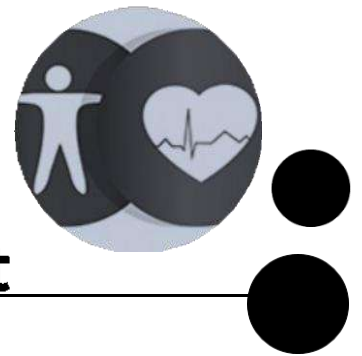
##### Area of Study 2 Food in the home

In this area of study students further explore food production, focusing on domestic and small-scale food production.

Outcome 2: On completion of this unit the student should be able to use a range of measures to evaluate food products prepared in different settings for a range of dietary requirements, and create a food product that illustrates potential adaptation in a commercial context.

Please note that there is a subject material charge.





## Health and Human Development

### Unit 1

This unit looks at health and wellbeing as a concept with varied and evolving perspectives and definitions. It takes the view that health and wellbeing are subject to a wide range of contexts and interpretations, with different meanings for different people. As a foundation to the understanding of health, students should investigate the World Health Organization's (WHO) definition and also explore other interpretations. Wellbeing is a complex combination of all dimensions of health, characterised by an equilibrium in which the individual feels happy, healthy, capable and engaged.

Area of Study 1: Health perspectives and influences.

On completion of this unit the student should be able to explain multiple dimensions of health and wellbeing, explain indicators used to measure health status and analyse factors that contribute to variations in health status of youth.

Area of Study 2: Health and nutrition

On completion of this unit the student should be able to apply nutrition knowledge and tools to the selection of food and the evaluation of nutrition information.

Area of Study 3: Youth health and wellbeing

On completion of this unit the student should be able to interpret data to identify key areas for improving youth health and wellbeing, and plan for action by analysing one particular area in detail.

### Unit 2

This unit investigates transitions in health and wellbeing, and development, from lifespan and societal perspectives. Students look at changes and expectations that are part of the progression from youth to adulthood.

Area of Study 1: Developmental transitions

On completion of this unit the student should be able to explain developmental changes in the transition from youth to adulthood, analyse factors that contribute to healthy development during prenatal and early childhood stages of the lifespan.

Area of Study 2: Health care in Australia

On completion of this unit the student should be able to describe how to access Australia's health system, explain how it promotes health and wellbeing in their local community, and analyse a range of issues associated with the use of new and emerging health procedures and technologies.







## History: Empires

### Units 1 and 2 – Empires

In Units 1 and 2 Empires, students investigate the foundations and features of empires and the significant global changes they brought to the wider world in the early modern period. Empires at their core were expansionist, dominating trade and political influence in their regional or global contexts. A range of key factors arising from the social, political, economic, cultural, religious, environmental and technological features of Empires played a role in the ambition and quest for power, prestige and influence over rival and competing states.

By the 15th century, international trade was dominated by the Republic of Venice, the Ming Dynasty in China and the Byzantine Empire. Between them they controlled key trading hubs along the Silk Road and Mediterranean Sea, in cities such as Constantinople, Venice and Beijing. Other empires were regional rather than global in reach: Mughals in India, Ming and Qing in China and the Tsars of Russia. By the 16th century the Ottoman Empire conquered Constantinople and controlled key trading routes. Emerging European powers Portugal, Spain, France, Britain and the Netherlands circumvented the power of these established empires, gaining access to goods through alternative routes. By harnessing new knowledge and technologies, their voyages of exploration into the Asia-Pacific, the Americas and Africa challenged the hegemony of power of existing empires beyond the Mediterranean world.

Mindsets also changed. Emergent new ideas of the Renaissance brought forth innovative theories of the Scientific Revolution, the reforms of Protestant Reformation and the Counter-Reformation and, later, the Enlightenment. New economic structures of capitalism and mercantilism and the political ideas of absolute authority enabled Western European empires to entrench and impose their power on their colonial subjects. Consequently, new trade networks such as the 'Columbian Exchange' increased the prevalence and reliance on the slave trade and the demand for resources. Europe and Asia profited in their monopolies at the expense of indigenous cultures and environmental sustainability.

Imperial exploitation of colonial outposts and occupied territories drastically affected the indigenous peoples and the colonial societies. The local and international rivalries that ensued had an impact on the management and defence of empires. Wars and conflicts escalated as the quest for territorial power and resources intensified, culminating in the Seven Year's War, which later influenced the revolutions within America, France and Haiti.





## Legal Studies

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### Unit 1 – Guilt and liability

Students investigate key concepts of criminal law and civil law and apply these to actual and/or hypothetical scenarios to determine whether an accused may be found guilty of a crime, or liable in a civil dispute. In doing so, students develop an appreciation of the way in which legal principles and information are used in making reasoned judgments and conclusions about the culpability of an accused, and the liability of a party in a civil dispute.

**Outcome 1:** On completion of this unit the student should be able to describe the main sources and types of law, and assess the effectiveness of laws.

**Outcome 2:** On completion of this unit the student should be able to explain the purposes and key concepts of criminal law, and use legal reasoning to argue the criminal culpability of an accused based on actual and/or hypothetical scenarios.

**Outcome 3:** On completion of this unit the student should be able to explain the purposes and key concepts of civil law, and apply legal reasoning to argue the liability of a party in civil law based on actual and/or hypothetical scenarios.

### Unit 2 – Sanctions, remedies and rights

Students undertake a detailed investigation of two criminal cases and two civil cases from the past four years to form a judgment about the ability of sanctions and remedies to achieve the principles of justice.

**Outcome 1:** On completion of this unit the student should be able to explain key concepts in the determination of a criminal case, and discuss the principles of justice in relation to the determination of criminal cases, sanctions and sentencing approaches.

**Outcome 2:** On completion of this unit the student should be able to explain key concepts in the resolution of a civil dispute, and discuss the principles of justice in relation to the resolution of civil disputes and remedies.

**Outcome 3:** On completion of this unit the student should be able to evaluate the ways in which rights are protected in Australia, compare this approach with that adopted by another country and discuss the impact of an Australian case on the rights of individuals and the legal system.





## Literature

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### Unit 1

#### Area of Study 1: Reading Practices

Students consider how language, structure and stylistic choices are used in different literary forms and types of text. They consider both print and non-print texts, reflecting on the contribution of form and style to meaning. Students reflect on the degree to which points of view, experiences and contexts shape their own and others' interpretations of text.

Students closely examine the literary forms, features and language of texts. They begin to identify and explore textual details, including language and features, to develop a close analysis response to a text.

#### Area of Study 2: Exploration of literary movements and genres

Students explore the concerns, ideas, style and conventions common to a distinctive type of literature seen in literary movements or genres. Students explore texts from the selected movement or genre, identifying and examining attributes, patterns and similarities that locate each text within that grouping.

On completion of this unit the student should be able to explore conventions common to a selected movement or genre, and engage with the ideas, concerns and representations from at least one complete text alongside multiple samples of other texts considered characteristic of the selected movement or genre.

### Unit 2

#### Area of Study 1: Voices of Country

Students explore the voices, perspectives and knowledge of Aboriginal and Torres Strait Islander authors and creators. They consider the interconnectedness of place, culture and identity through the experiences, texts and voices of Aboriginal and Torres Strait Islander peoples, including connections to Country, the impact of colonisation and its ongoing consequences, and issues of reconciliation and reclamation.

Students acknowledge and reflect on a range of Australian views and values (including their own) through a text(s). Within that exploration, students consider stories about the Australian landscape and culture.

On completion of this unit the student should be able to explore and reflect on the voices, perspectives and knowledge in the texts of Aboriginal and Torres Strait Islander authors and creators.

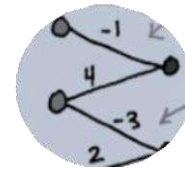
#### Area of Study 2: The text in its context

In this area of study students focus on the text and its historical, social and cultural context. Students reflect on representations of a specific time period and/or culture within a text.

Students explore the text to understand its point of view and what it reflects or comments on. They identify the language and the representations in the text that reflect the specific time period and/or culture, its ideas and concepts. Students develop an understanding that contextual meaning is already implicitly or explicitly inscribed in a text and that textual details and structures can be scrutinised to illustrate its significance.

Students develop the ability to analyse language closely, recognising that words have historical and cultural import.





## Mathematics: General Mathematics

General Mathematics Units 1 and 2 cater for a range of student interests, provide preparation for the study of VCE General Mathematics at the Units 3 and 4 level and contain assumed knowledge and skills for these units.

In undertaking these units, students are expected to be able to apply techniques, routines and processes involving rational and real arithmetic, sets, lists, tables and matrices, diagrams and geometric constructions, algorithms, algebraic manipulation, recurrence relations, equations and graphs, with and without the use of technology. They should have facility with relevant mental and by-hand approaches to estimation and computation. The use of numerical, graphical, geometric, symbolic, financial and statistical functionality of technology for teaching and learning mathematics, for working mathematically, and in related assessment, is to be incorporated throughout each unit as applicable.

### Unit 1

Area of Study 1 – Data analysis, probability and statistics

Area of Study 2 – Algebra, number and structure

Area of Study 3 – Functions, relations and graphs

Area of Study 4 – Discrete mathematics

### Unit 2

Area of Study 1 – Data analysis, probability and statistics

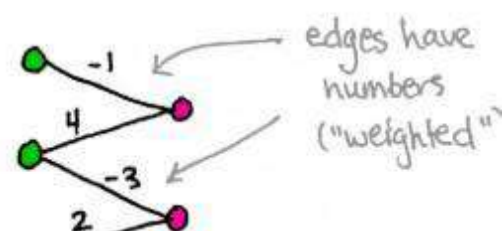
Area of Study 2 – Discrete mathematics

Area of Study 3 – Functions, relations and graphs

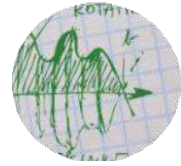
Area of Study 4 – Space and measurement

M has **three rows** & **two columns** and corresponds to this weighted bipartite graph:

$$M = \begin{bmatrix} -1 & 0 \\ 4 & -3 \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 4 & -3 \end{bmatrix}$$







## Mathematics: Mathematical Methods

### Unit 1

Mathematical Methods Units 1 and 2 provide an introductory study of simple elementary functions of a single real variable, algebra, calculus, probability and statistics and their applications in a variety of practical and theoretical contexts. The units are designed as preparation for Mathematical Methods Units 3 and 4 and contain assumed knowledge and skills for these units.

Area of Study 1: Functions, relations and graphs

Area of Study 2: Algebra, number and structure

Area of Study 3: Calculus

Area of Study 4: Data analysis, probability and statistics

### Unit 2

The focus of Unit 2 is the study of simple transcendental functions, the calculus of polynomial functions and related modelling applications. The areas of study are 'Functions, relations and graphs', 'Algebra, number and structure', 'Calculus' and 'Data analysis, probability and statistics'. At the end of Unit 2, students are expected to have covered the content outlined in each area of study.

Area of Study 1: Functions, relations and graphs

Area of Study 2: Algebra, number and structure

Area of Study 3: Calculus

Area of Study 4: Data analysis, probability and statistics





## Mathematics: Specialist Mathematics

### Unit 1

#### Area of Study 1 – Algebra, number and structure

In this area of study students cover the development of formal mathematical notation, definition, reasoning and proof applied to number systems, graph theory, sets, logic, and Boolean algebra, and the development of algorithms to solve problems.

#### Area of Study 2

##### Discrete mathematics

In this area of study students cover the study of sequences, series, and first-order linear difference equations, combinatorics, including the pigeon-hole principle, the inclusion-exclusion principle, permutations and combinations, combinatorial identities, and matrices.

##### Mathematical investigation

This comprises one to two weeks of investigation into one or two practical or theoretical contexts or scenarios based on content from areas of study and application of key knowledge and key skills for the outcomes.

Investigation is to be incorporated in the development of concepts, skills and processes for the unit, and can be used to assess the outcomes.

### Unit 2

#### Area of Study 1 – Data analysis, probability and statistics

In this area of study students cover the study of linear combinations of random variables and the distribution of sample means of a population, with the use of technology to explore variability of sample means.

#### Area of Study 2 – Space and measurement

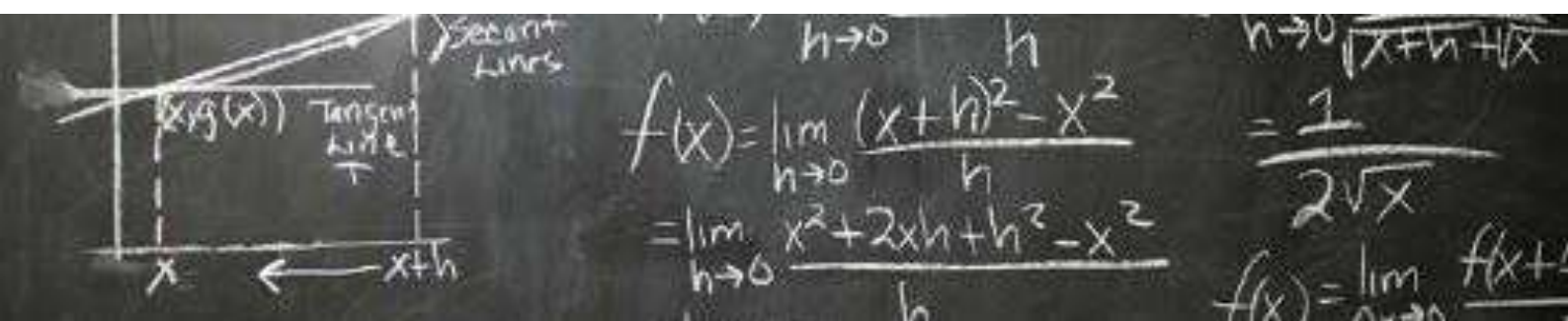
In this area of study students cover trigonometry and identities, rotation and reflection transformations of the plane and vectors for working with position, shape, direction and movement in the plane and related applications.

#### Area of Study 3 – Algebra, number and structure

In this area of study students cover the arithmetic and algebra of complex numbers, including polar form, regions and curves in the complex plane and introduction to factorisation of quadratic functions over the complex field.

#### Area of Study 4 – Functions, relations and graphs

In this area of study students cover an introduction to partial fractions; reciprocal and inverse circular functions and their graphs and simple transformations of these graphs; locus definitions of lines, parabolas, circles, ellipses and hyperbolas and the Cartesian, parametric and polar forms of these relations.





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## **Outdoor & Environmental Studies**

### Unit 1 – Exploring Outdoor Experiences

This unit examines some of the ways in which humans understand and relate to nature through experiences of outdoor environments. The focus is on individual and their personal responses to and experiences of outdoor environments.

Students are provided with the opportunity to explore the many ways in which nature is understood and perceived. Students develop a clear understanding of the range of motivations for interacting with outdoor environments and the factors that affect an individual's access to outdoor experiences and relationships with outdoor environments. Through outdoor experiences, students develop practical skills and knowledge to help them live sustainably in outdoor environments. Students understand the links between practical experiences and theoretical investigations, gaining insight into a variety of responses to, and relationships with, nature.

### Unit 2 – Discovering Outdoor Environments

This unit focuses on the characteristics of outdoor environments and different ways of understanding them, as well as the impact of humans on outdoor environments.

In this unit students study the impact of nature on humans, and the ecological, social and economic implications of the impact of humans on outdoor environments. Students develop a clear understanding of the impact of technologies and changing human lifestyles on outdoor environments. Students examine a number of case studies of specific outdoor environments, including areas where there is evidence of human intervention.

They develop the practical skills required to minimise the impact of humans on outdoor environments. Through practical experiences, students are able to make comparisons between and to reflect upon outdoor environments, as well as to develop theoretical knowledge about natural environments.

### Special Requirements

The cost for the subject is approximately \$600.00 for the year. This will cover all activity costs for multiple excursions and camps. Students will be required to participate in a variety of outdoor field trips and camps throughout the year. Trips may include snow camps, hiking, surfing, snorkeling, canoeing and mountain biking.

\*\* Please note that it is a requirement of the subject that you must participate in ALL activities associated with the study in order to gain a satisfactory result for the subject unless medical unfit.





## Physical Education

### Unit 1 – The human body in motion

In this unit students explore how the musculoskeletal and cardiorespiratory systems work together to produce movement. Through practical activities students explore the relationships between the body systems and physical activity, sport and exercise, and how the systems adapt and adjust to the demands of the activity. Students investigate the role and function of the main structures in each system and how they respond to physical activity, sport and exercise. They explore how the capacity and functioning of each system acts as an enabler or barrier to movement and participation in physical activity. Using a contemporary approach, students evaluate the social, cultural and environmental influences on movement.

#### Area of Study 1

How does the musculoskeletal system work to produce movement?

#### Area of Study 2

How does the cardiorespiratory system function at rest and during physical activity?

### Unit 2 – Physical activity, sport and society

This unit develops students' understanding of physical activity, sport and society from a participatory perspective. Students are introduced to types of physical activity and the role participation in physical activity and sedentary behaviour plays in their own health and wellbeing as well as in other people's lives in different population groups. Through a series of practical activities, students experience and explore different types of physical activity promoted in their own and different population groups. They explore a range of factors that influence and facilitate participation in regular physical activity. They collect data to determine perceived enablers of and barriers to physical activity and the ways in which opportunities for participation in physical activity can be extended in various communities, social, cultural and environmental contexts.

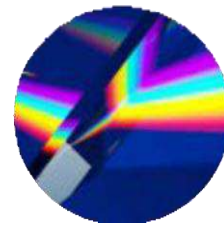
#### Area of Study 1

What are the relationships between physical activity, sport, health and society?

#### Area of Study 2

What are the contemporary issues associated with physical activity and sport?





## Physics

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### Unit 1

In this unit students examine some of the fundamental ideas and models used by physicists in an attempt to understand and explain energy. Models used to understand light, thermal energy, radioactivity, nuclear processes and electricity are explored.

#### Area of Study 1: How are light and heat explained?

In this area of study, students study light using the wave model and thermal energy using a particle model forming an understanding of the fundamental physics ideas of reflection, refraction and dispersion.

#### Area of Study 2: How is energy from the nucleus utilised?

In this area of study, students build on their understanding of energy to explore energy that derives from the nuclei of atoms. They learn about the properties of the radiation from the nucleus and the effects of this radiation on human cells and tissues and apply this understanding to the use of radioisotopes in medical therapy.

#### Area of Study 3: How can electricity be used to transfer energy?

In this area of study, students develop conceptual models to analyse electrical phenomena and undertake practical investigations of circuit components. Concepts of electrical safety are developed through the study of safety mechanisms and the effect of current on humans.

### Unit 2

In this unit students explore the power of experiments in developing models and theories. They investigate a variety of phenomena by making their own observations and generating questions, which in turn lead to experiments.

#### Area of Study 1: How is motion understood?

In this area of study, students describe and analyse graphically, numerically and algebraically the energy and motion of an object, using specific physics terminology and conventions

#### Area of Study 2: How does physics inform contemporary issues and applications in society?

In this area of study, students develop a deeper understanding of an area of interest within diverse areas of physics. They select from eighteen options, explore the related physics and use this physics to form a stance, opinion or solution to a contemporary societal issue or application.

#### Area of Study 3: How do physicists investigate questions?

In this area of study, students adapt or design and then conduct a scientific investigation to generate appropriate primary qualitative and/or quantitative data, organise and interpret the data, and reach and evaluate a conclusion in response to the research question.





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## Psychology

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### Unit 1

In this unit students examine the development of psychological models and theories used to predict and explain the development of thoughts, emotions and behaviours. They investigate the structure and functioning of the human brain and the role it plays in mental processes and behaviour and explore brain plasticity and the influence that brain damage may have on a person's psychological functioning.

Area of Study 1: What influences psychological development?

In this area of study students explore how these factors influence different aspects of a person's psychological development, recognising that individuals are not fixed from birth but instead can grow and change psychologically across their lives.

Area of Study 2: How are mental processes and behaviour influenced by the brain?

In this area of study students explore how the understanding of brain structure and function has changed over time, considering the influence of different approaches and contributions to understanding the role of the brain.

Area of Study 3: How does contemporary psychology conduct and validate psychological research?

In this area of study students investigate how science is used to explore and validate contemporary psychological research questions.

### Unit 2

In this unit students evaluate the role social cognition plays in a person's attitudes, perception of themselves and relationships with others. Students explore a variety of factors and contexts that can influence the behaviour of individuals and groups. Students are encouraged to consider Aboriginal and Torres Strait Islander people's experiences within Australian society and how these experiences may affect psychological functioning.

Area of Study 1: How are people influenced to behave in particular ways?

In this area of study students explore the interplay of psychological and social factors that shape the identity and behaviour of individuals and groups. Students consider how factors such as person perception, attributions, attitudes and stereotypes can be used to explain the cause and dynamics of individual and group behaviours.

Area of Study 2: What influences a person's perception of the world?

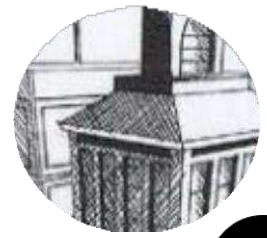
In this area of study students explore the role of attention in making sense of the world around them and they consider two aspects of human perception – vision and taste – and consider how perception is influenced by cultural norms and historical experiences.

Area of Study 3: How do scientific investigations develop understanding of influences on perception and behaviour?

In this area of study students adapt or design and then conduct a scientific investigation into the internal or external influences on perception and/or behaviour. They generate appropriate qualitative and/or quantitative data, organise and interpret the data, and research a conclusion in response to the research question.



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# Visual Communication & Design

In Visual communication, you are being prepared for industry guidelines in the form of advertising for audiences, and creating innovative products for a variety of art/design businesses. These include area such as:

Graphic Design Architecture Animation and Games Advertising  
Film Production Illustration Fashion Design

Unit 1: Introduction to visual communication design

This unit focuses on using visual images to communicate messages, ideas and concepts. This involves acquiring and applying design thinking skills as well as drawing skills to create messages, ideas and concepts, both visible and tangible. Students practise their ability to draw what they observe and they use visualisation drawing methods to explore their own ideas and concepts. Students develop an understanding of the importance of presentation drawings to clearly communicate their final visual communications.

Area of Study 1 Drawing as a means of communication Area of Study 2 Design elements and design principles Area of Study 3 Visual communications in context

Unit 2: Applications of visual communication within design fields

This unit focuses on the application of visual communication design knowledge, design thinking and drawing methods to create visual communications to meet specific purposes in designated design fields. Students use presentation drawing methods that incorporate the use of technical drawing conventions to communicate information and ideas associated with the environmental or industrial fields of design. They also investigate how typography and imagery are used in these fields as well as the communication field of design and development and refinement of concepts to create visual communications.

Area of Study 1 Technical drawing in context

Area of Study 2 Type and imagery in context

Area of Study 3 Applying the design process



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William Ruthven  
Secondary College  
Pathways  
2023

**Units 3 & 4**



**WILLIAM RUTHVEN  
SECONDARY COLLEGE**





## Accounting

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### Unit 3 – Financial accounting for a trading business

#### Area of Study 1 – Recording and analysing financial data

In this area of study students focus on identifying and recording financial data for a business. They use double entry accounting to record data and generate accounting information in the form of accounting reports and graphical representations. This information is used to assist the owner in making informed decisions about the operation of the business. Students should also consider strategies to improve the performance of the business, taking into account the ethical considerations relevant to the business owner.

#### Area of Study 2 Preparing and interpreting accounting reports

The preparation of financial reports at the end of the reporting period provides information to be used as a basis for planning and decision-making by the business owner. Students develop their understanding of the accounting processes and complete those processes that are applicable to the end of a reporting period for a trading business. They apply the accrual method of accounting to the preparation of accounting reports and draw a distinction between cash and profit, considering the implications of these differences when using reports to make decisions. Students undertake an analysis of accounting reports and interpret the information, taking into account relevant ethical considerations, in order to evaluate the performance of the business.

### Unit 4 – Recording, reporting, budgeting and decision-making

#### Area of Study 1 Extension of recording and reporting

In this area of study students further develop their understanding of the recording and reporting of financial data in the General Journal and General Ledger by focusing on balance day adjustments and the alternative methods of depreciating for non-current depreciable assets. Students prepare accounting reports using manual methods and ICT. They consider the effect of balance day adjustments on the accounting reports, and the implications of using alternative methods of depreciation on the accounting reports and on the performance of the business. They also examine ethical considerations that may affect the recording and reporting of financial data and business performance.

#### Area of Study 2 Budgeting and decision-making

Business owners must plan for future activities if they are to successfully manage the business. Preparing budgeted accounting reports provides the owner with information that will assist in managing and developing strategies to improve business performance. Students prepare and analyse budgeted accounting reports, both manually and using ICT, and suggest strategies to improve the performance of the business. They also discuss and evaluate the ethical considerations associated with business decision-making and business improvement.





## Art Creative Practice

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### Unit 3 – Investigation, ideas, artworks and the Creative Practice

In this unit students use inquiry and project-based learning as starting points to develop a Body of Work. They explore ideas and experiment with materials, techniques and processes using the Creative Practice. The research of historical and contemporary artists is integral to students' use of the Creative Practice and informs the basis of their investigation. Students also investigate the issues that may arise from the artworks they view and discuss, or those evolving from the practice of the artist. Unit 3 commences with students researching the practice of a selected artist as the starting point to develop a finished artwork. The finished artwork will contribute to the Body of Work developed over Units 3 and 4. In Unit 3, the Interpretive Lenses are used in Making and Responding throughout the students' art practice. Students apply the Interpretive Lenses to researched artworks and in their reflective analysis and evaluation of their use of the Creative Practice. They use critical and creative thinking skills to explore and develop ideas, and experiment with materials, techniques and processes.

Area of Study One– Investigation and presentation

Research and exploration

Area of Study 2–Personal investigation using the Creative Practice

### Unit 4 – Interpreting, resolving and presenting artworks and the Creative Practice

In Unit 4 students continue to develop their art practice through Project-based and Inquiry learning as their research and exploration continues to support the development of their Body of Work. Throughout their research students study the practices of selected historical and contemporary artists to inform their own art practice. They use the Interpretive Lenses to analyse, compare and interpret the meanings and messages of artworks produced by the artists they study. Students also apply the Interpretive Lenses throughout the Creative Practice to resolve and refine their Body of Work. Students continue to build upon the ideas begun in Unit 3 and present a critique of their use of the Creative Practice. They reflect on the feedback from their critique to further refine and resolve a Body of Work that demonstrates their use of the Creative Practice and the realisation of their personal ideas. The students present their Body of Work to an audience accompanied by documentation of their use of the Creative Practice.

Area of Study 1

Documentation and critique of the Creative Practice

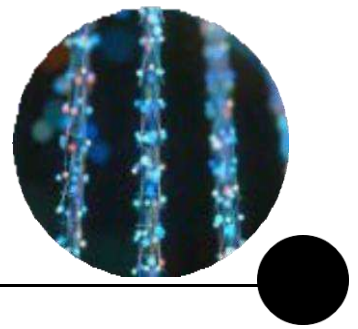
Area of Study 2

Resolution and presentation of a Body of Work

Area of Study 3

Comparison of artists, their practice and their artworks





## Biology

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### Unit 3 – How do cells maintain life?

In this unit, students investigate the workings of the cell from several perspectives. They explore the importance of the insolubility of the plasma membrane in water and its differential permeability to specific solutes in defining the cell, its internal spaces and the control of the movement of molecules and ions in and out of such spaces. Students consider base pairing specificity, the binding of enzymes and substrates, the response of receptors to signalling molecules and reactions between antigens and antibodies to highlight the importance of molecular interactions based on the complementary nature of specific molecules. Students study the synthesis, structure and function of nucleic acids and proteins as key molecules in cellular processes. They explore the chemistry of cells by examining the nature of biochemical pathways, their components and energy transformations.

Outcome 1: On completion of this unit the student should be able to explain the dynamic nature of the cell in terms of key cellular processes including regulation, photosynthesis and cellular respiration, and analyse factors that affect the rate of biochemical reactions.

Outcome 2: On completion of this unit the students should be able to apply a stimulus–response model to explain how cells communicate with each other, outline human responses to invading pathogens, distinguish between the different ways that immunity may be acquired, and explain how malfunctions of the immune system cause disease.

### Unit 4 – How does life change and respond to challenges over time?

In this unit, students consider the continual change and challenges to which life on Earth has been subjected. They investigate the relatedness between species and the impact of various change events on a population’s gene pool. The accumulation of changes over time is considered as a mechanism for biological evolution by natural selection that leads to the rise of new species. Students examine change in life forms using evidence from paleontology, biogeography, developmental biology and structural morphology. They explore how technological developments in the fields of comparative genomics, molecular homology and bioinformatics have resulted in evidence of change through measurements of relatedness between species. Students examine the structural and cognitive trends in the human fossil record and the interrelationships between human biological and cultural evolution.

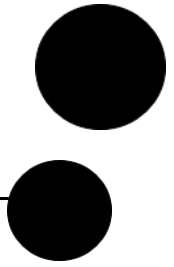
Outcome 1: On completion of this unit the student should be able to analyse evidence for evolutionary change, explain how relatedness between species is determined, and elaborate on the consequences of biological change in human evolution.

Outcome 2: On completion of this unit the student should be able to describe how tools and techniques can be used to manipulate DNA, explain how biological knowledge is applied to biotechnical applications, and analyse the interrelationship between scientific knowledge and its applications in society.





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# **Business Management**

## Unit 3 – Managing a business

In this unit students explore the key processes and considerations for managing a business efficiently

and effectively to achieve business objectives. Students examine different types of businesses and their respective objectives and stakeholders. They investigate strategies to manage both staff and business operations to meet objectives, and develop an understanding of the complexity and challenge of managing businesses. Students compare theoretical perspectives with current practice through the use of contemporary Australian and global business case studies from the past four years.

**Outcome 1:** On completion of this unit the student should be able to analyse the key characteristics of businesses, their stakeholders, management styles and skills, and corporate culture.

**Outcome 2:** On completion of this unit the student should be able to explain theories of motivation and apply them to a range of contexts and analyse and evaluate strategies related to the management of employees.

**Outcome 3:** On completion of this unit the student should be able to analyse the relationship between business objectives and operations management, and propose and evaluate strategies to improve the efficiency and effectiveness of business operations.

## Unit 4 – Transforming a business

Businesses are under constant pressure to adapt and change to meet their objectives. In this unit students consider the importance of reviewing key performance indicators to determine current performance and the strategic management necessary to position a business for the future. Students study a theoretical model to undertake change and consider a variety of strategies to manage change in the most efficient and effective way to improve business performance. They investigate the importance of effective management and leadership in change management. Using one or more contemporary business case studies from the past four years, students evaluate business practice against theory.

**Outcome 1:** On completion of this unit the student should be able to explain the way business change may come about, analyse why managers may take a proactive or reactive approach to change, use key performance indicators to analyse the performance of a business, explain the driving and restraining forces for change, and evaluate management strategies to position a business for the future.

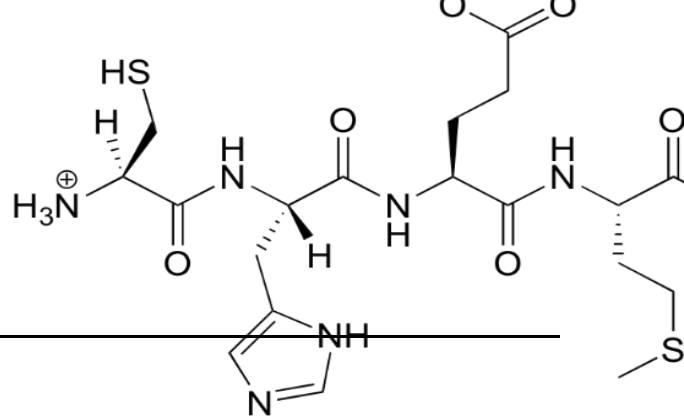
**Outcome 2:** On completion of this unit the student should be able to discuss the importance of effective management strategies and leadership in relation to change, evaluate the effectiveness of a variety of strategies used by managers to implement change, and discuss the effect of change on the stakeholders of a business.





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# Chemistry



## Unit 3

In this unit students investigate the chemical production of energy and materials. They explore how innovation, design and sustainability principles and concepts can be applied to produce energy and materials while minimising possible harmful effects of production on human health and the environment.

**Area of Study 1: What are the current and future options for supplying energy?**

In this area of study students focus on analysing and comparing a range of fossil fuels and biofuels as energy sources for society, and carbohydrates, proteins and lipids as fuel sources for the body.

**Area of Study 2: How can the rate and yield of chemical reactions be optimised?**

In this area of study, students explore the factors that affect the rate and yield of equilibrium and electrolytic reactions involved in producing important materials for society.

## Unit 4

Carbon is the basis not only of the structure of living tissues but is also found in fuels, foods, medicines, polymers and many other materials that we use in everyday life. In this unit students investigate the structures and reactions of carbon-based organic compounds, including considering how green chemistry principles are applied in the production of synthetic organic compounds.

**Area of Study 1: How are organic compounds categorised and synthesised?**

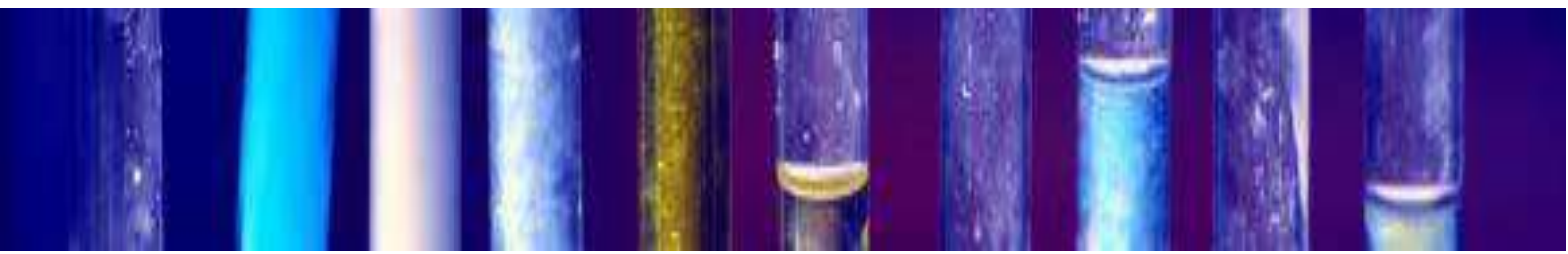
In this area of study students focus on the structure, naming, properties and reactions of organic compounds, including the chemical reactions associated with the metabolism of food. They explore how synthetic organic compounds can be produced more sustainably for use in society.

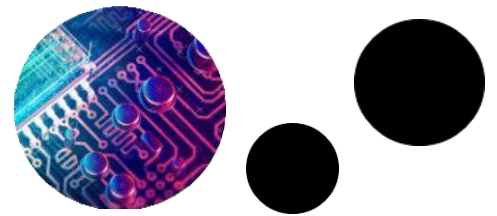
**Area of Study 2: How are organic compounds analysed and used?**

In this area of study students focus on laboratory and instrumental analyses of organic compounds, and the function of some organic compounds as medicines.

**Area of Study 3: How is scientific inquiry used to investigate the sustainable production of energy and/or materials?**

Students undertake a student-designed scientific investigation in either Unit 3 or Unit 4, or across both Units 3 and 4..





## Computing: Software Development

### Unit 3

In this unit students apply the problem-solving methodology to develop working software modules using a programming language. Students develop an understanding of the analysis, design and development stages of the problem-solving methodology.

#### Area of Study 1 – Software development: programming

In this area of study students examine the features and purposes of different design tools to accurately interpret the requirements and designs for developing working software modules. Students use a programming language and undertake the problem-solving activities of manipulation programming, validation, testing and documentation in the development stage.

#### Area of Study 2 – Software development: analysis and design

In this area of study students construct the framework for the development of a software solution that meets a student-identified need or opportunity. This is the first part of the School-assessed Task (SAT), involving analysis and design, with the second part undertaken in Unit 4, Area of Study 1.

### Unit 4

In this unit students focus on how the information needs of individuals and organisations are met through the creation of software solutions. They consider the risks to software and data during the software development process, as well as throughout the use of the software solution by an organisation.

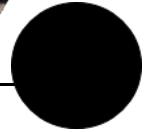
#### Area of Study 1 – Software development: development and evaluation

In this area of study students develop the design they prepared in Unit 3, Area of Study 2, into a software solution that meets an identified need or opportunity by applying the problem-solving stages of development and evaluation.

#### Area of Study 2 – Cybersecurity: software security

Organisations are increasingly dependent on the use of software to achieve their goals and objectives. In this area of study students focus on the security risks to software and data during the software development process and throughout the use of the software solution by an organisation. Students analyse and evaluate the security of current software development practices, examine the risks to software and data, and consider the consequences of implementing software with ineffective security strategies.





## English/EAL

Unit 3: Students focus on understanding the ways in which authors construct meaning with particular attention to the features of texts such as the structure, conventions and language. Students explore the underlying concepts of texts and develop an interpretation. Students also analyse and compare in writing the language and argument used in persuasive texts on current issues.

Assessment:

An analytical response to a set text A creative response to a set text

An analysis and comparison of the use of argument and persuasive language in texts

Unit 4: Students study texts comparatively with a focus on the ways that ideas, issues and themes are handled in each. Consideration of the ways that text features impact on meaning leads students to produce a written comparison of two texts. Students will also deliver a sustained and reasoned point of view on a current issue and provide a written statement of intent articulating decisions made.

Assessment:

A detailed comparison of two texts

An oral presentation on an issue accompanied by a written statement of intention

### **ENGLISH AS AN ADDITIONAL LANGUAGE (EAL)**

Unit 3: This unit focuses on reading and creating a sustained interpretation of a selected text. In addition, students analyse and compare the ways in which language is used to persuade in texts that present a point of view on a current issue. Students will also develop their listening skills by completing aural tasks.

Assessment:

An analytical interpretation of a set text

Short answer responses and note form summaries of persuasive texts and a written analysis and comparison of argument and the use of persuasive language in texts

Listening tasks

Unit 4: Students compare ideas, issues and themes in two selected texts in order to deepen their understanding of key themes, issues and ideas. Students will craft a persuasive oral presentation with the intent of positioning an audience to share a point of view.

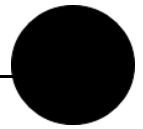
Assessment:

A detailed comparison of two texts

An oral presentation on an issue accompanied by a written statement of intention.







## Food Studies

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### Unit 3 – Food in daily life

#### Area of Study 1 – The science of food

In this area of study students focus on the science of food, underpinned by practical activities. They investigate the science of food appreciation, physiology of digestion, absorption and utilisation of macronutrients: carbohydrates, including dietary fibre, fats and proteins. Students develop their capacity to analyse advice on food choices through investigating food allergies and intolerances, and the science behind the nutritional rationale and evidence-based recommendations of the Australian Dietary Guidelines.

#### Area of Study 2 – Food choices, health and wellbeing

In this area of study students focus on patterns of eating in Australia and the influences on the food we eat. Students look at relationships between social factors and food access and choices, as well as the social and emotional roles of food in shaping and expressing identity and how food may link to psychological factors. They inquire into the role of politics and media as influences on the formation of food habits, beliefs and food sovereignty.

### Unit 4 – Food issues, challenges and futures

#### Area of Study 1 – Navigating food information

In this area of study students focus on food information and misinformation and the development of food knowledge, skills and habits. Students learn to assess information and draw evidence-based conclusions to navigate contemporary food fads, trends and diets. They reflect on a selected food fad, trend or diet and assess its credibility and the reliability of its claims, taking into consideration the principles of evidence-based research and healthy eating recommendations that support the Australian Dietary Guidelines and the Australian Guide to Healthy Eating.

#### Area of Study 2

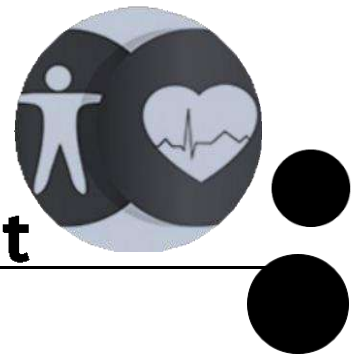
##### Environment and ethics

In this area of study students address debates concerning Australian and global food systems, relating to issues on the environment, ethics, innovations and technologies, food access, food safety, and the use of agricultural resources. Students explore a range of debates through identifying issues, forming an understanding of current situations and considering possible futures. They research one selected debate in depth, seeking clarity on disparate points of view, considering proposed solutions and analysing work undertaken to solve problems and support sustainable futures.

Please note that there is a subject material charge.







## Health and Human Development

### Unit 3 – Australia’s health in a globalised world

This unit looks at health, wellbeing and illness as multidimensional, dynamic and subject to different interpretations and contexts. Students begin to explore health and wellbeing as a global concept and to take a broader approach to inquiry. As they consider the benefits of optimal health and wellbeing and its importance as an individual and a collective resource, their thinking extends to health as a universal right. Students look at the fundamental conditions required for health improvement, as stated by the World Health Organization (WHO). They use this knowledge as background to their analysis and evaluation of variations in the health status of Australians. Students look at various public health approaches and the interdependence of different models as they research health improvements and evaluate successful programs. While the emphasis is on the Australian health system, the progression of change in public health approaches should be seen within a global context.

Outcome 1: On completion of this unit the student should be able to explain the complex, dynamic and global nature of health and wellbeing, interpret and apply Australia’s health status data and analyse variations in health status.

Outcome 2: On completion of this unit the student should be able to explain changes to public health approaches, analyse improvements in population health over time and evaluate health promotion strategies.

### Unit 4 – Health and human development in a global context

This unit examines health and wellbeing, and human development in a global context. Students use data to investigate health status and burden of disease in different countries, exploring factors that contribute to health inequalities between and within countries, including the physical, social and economic conditions in which people live. Students build their understanding of health in a global context through examining changes in burden of disease over time and studying the key concepts of sustainability and human development. They consider the health implications of increased globalisation and worldwide trends relating to climate change, digital technologies, world trade and the mass movement of people. Students also investigate the role of non-government organisations and Australia’s overseas aid program. Students evaluate the effectiveness of health initiatives and programs in a global context and reflect on their capacity to take action.

Outcome 1: On completion of this unit the student should be able to analyse similarities and differences in health status and burden of disease globally and the factors that contribute to differences in health and wellbeing.

Outcome 2: On completion of this unit the student should be able to analyse relationships between the SDGs and their role in the promotion of health and human development, and evaluate the effectiveness of global aid programs.





## History: Revolutions

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Units 3 and 4

In Units 3 and 4 Revolutions students investigate the significant historical causes and consequences of political revolution.

Revolutions represent great ruptures in time and are a major turning point in the collapse and destruction of an existing political order which results in extensive change to society. Revolutions are caused by the interplay of events, ideas, individuals and popular movements, and the interplay between the political, social, cultural, economic and environmental conditions. Their consequences have a profound effect on the political and social structures of the post-revolutionary society. Revolution is a dramatically accelerated process whereby the new regime attempts to create political, social, cultural and economic change and transformation based on the regime's ideology.

Change in a post-revolutionary society is not guaranteed or inevitable and continuities can remain from the pre-revolutionary society. The implementation of revolutionary ideology was often challenged internally by civil war and externally by foreign threats. These challenges can result in a compromise of revolutionary ideals and extreme measures of violence, oppression and terror.

In these units students construct an argument about the past using historical sources (primary sources and historical interpretations) as evidence to analyse the complexity and multiplicity of the causes and consequences of revolution, and to evaluate the extent to which the revolution brought change to the lives of people. Students analyse the different perspectives and experiences of people who lived through dramatic revolutionary moments, and how society changed and/or remained the same. Students use historical interpretations to evaluate the causes and consequences of revolution and the extent of change instigated by the new regime.

### Outcome 1

On completion of this unit the student should be able to analyse the causes of revolution, and evaluate the contribution of significant events, ideas, individuals and popular movements.

### Outcome 2

On completion of this unit the student should be able to analyse the consequences of revolution and evaluate the extent of continuity and change in the post-revolutionary society.





## Legal Studies

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### Unit 3 – Rights and justice

The Victorian justice system, which includes the criminal and civil justice systems, aims to protect the rights of individuals and uphold the principles of justice: fairness, equality and access. In this unit students examine the methods and institutions in the justice system and consider their appropriateness in determining criminal cases and resolving civil disputes. Students consider the Magistrates' Court, County Court and Supreme Court within the Victorian court hierarchy, as well as other Victorian legal institutions and bodies available to assist with cases. Students explore matters such as the rights available to an accused and to victims in the criminal justice system, the roles of the judge, jury, legal practitioners and the parties, and the ability of sanctions and remedies to achieve their purposes. Students investigate the extent to which the principles of justice are upheld in the justice system.

**Outcome 1:** On completion of this unit the student should be able to explain the rights of the accused and of victims in the criminal justice system, discuss the means used to determine criminal cases and evaluate the ability of the criminal justice system to achieve the principles of justice.

**Outcome 2:** On completion of this unit the student should be able to analyse the factors to consider when initiating a civil claim, discuss the institutions and methods used to resolve civil disputes and evaluate the ability of the civil justice system to achieve the principles of justice.

### Unit 4 – The people and the law

The study of Australia's laws and legal system involves an understanding of institutions that make and reform our laws, and the relationship between the Australian people, the Australian Constitution and law-making bodies. In this unit, students explore how the Australian Constitution establishes the law-making powers of the Commonwealth and state parliaments, and protects the Australian people through structures that act as a check on parliament in law-making. Students develop an understanding of the significance of the High Court in protecting and interpreting the Australian Constitution. They investigate parliament and the courts, and the relationship between the two in law-making, and consider the roles of the individual, the media and law reform bodies in influencing law reform.

**Outcome 1:** On completion of this unit the student should be able to discuss the significance of High Court cases involving the interpretation of the Australian Constitution and evaluate the ways in which the Australian Constitution acts as a check on parliament in law-making.

**Outcome 2:** On completion of this unit the student should be able to discuss the factors that affect the ability of parliament and courts to make law, evaluate the ability of these law-makers to respond to the need for law reform, and analyse how individuals, the media and law reform bodies can influence a change in the law.







## Literature

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### Unit 3

#### Area of Study 1 – Adaptations and transformations

In this area of study students focus on how the form of a text contributes to its meaning. Students explore the form of a set text by constructing a close analysis of that text. They then reflect on the extent to which adapting the text to a different form, and often in a new or reimagined context, affects its meaning, comparing the original with the adaptation. By exploring an adaptation, students also consider how creators of adaptations may emphasise or minimise viewpoints, assumptions and ideas present in the original text.

#### Area of Study 2 – Developing interpretations

In this area of study students explore the different ways we can read and understand a text by developing, considering and comparing interpretations of a set text.

Students first develop their own interpretations of a set text, analysing how ideas, views and values are presented in a text, and the ways these are endorsed, challenged and/or marginalised through literary forms, features and language. These student interpretations should consider the historical, social and cultural context in which a text is written and set. Students also consider their own views and values as readers.

Students then explore a supplementary reading that can enrich, challenge and/or contest the ideas and the views, values and assumptions of the set text to further enhance the students' understanding. Examples of a supplementary reading can include writing by a teacher, a scholarly article or an explication of a literary theory. A supplementary reading that provides only opinion or evaluation of the relative merits of the text is not considered appropriate for this task.

### Unit 4

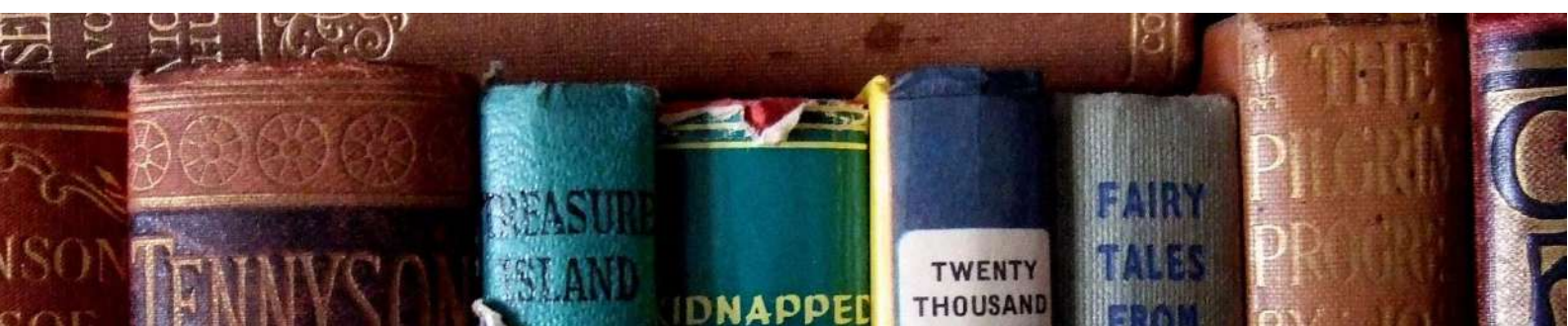
#### Area of Study 1 – Creative responses to texts

In this area of study students focus on the imaginative techniques used for creating and recreating a literary work. Students use their knowledge of how the meaning of texts can change as context and form change to construct their own creative transformations of texts. They learn how authors develop representations of people and places, and they develop an understanding of language, voice, form and structure. Students draw inferences from the original text in order to create their own writing. In their adaptation of the tone and the style of the original text, students develop an understanding of the views and values explored.

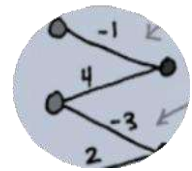
#### Area of Study 2

##### Close analysis of texts

In this area of study students focus on a detailed scrutiny of the language, style, concerns and construction of texts. Students attend closely to textual details to examine the ways specific passages in a text contribute to their overall understanding of the whole text. Students consider literary forms, features and language, and the views and values of the text. They write expressively to develop a close analysis, using detailed references to the text.







## Mathematics: General Mathematics

Unit 3 and 4

General Mathematics Units 3 and 4 focus on real-life application of mathematics and consist of the areas of study 'Data analysis, probability and statistics' and 'Discrete mathematics'.

Unit 3 comprises Data analysis and Recursion and financial modelling.

Unit 4 comprises Matrices and Networks and decision mathematics.

Area of Study 1: Data analysis, probability and statistics

Area of Study 2: Discrete mathematics Networks and decision mathematics Graphs and networks

Outcome 1

On completion of this unit the student should be able to define and explain key concepts as specified in the content from the areas of study and apply a range of related mathematical routines and procedures.

Outcome 2

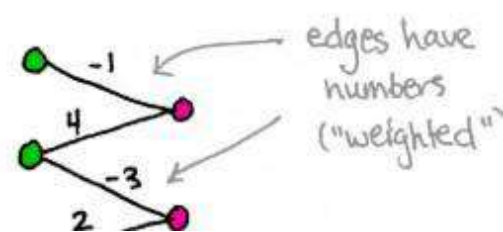
On completion of this unit the student should be able to apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

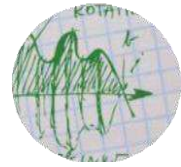
Outcome 3

On completion of this unit the student should be able to apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.

M has three rows & two columns and corresponds to this weighted bipartite graph:

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## Mathematics: Mathematical Methods

### Units 3 and 4

Mathematical Methods Units 3 and 4 extend the introductory study of simple elementary functions of a single real variable, to include combinations of these functions, algebra, calculus, probability and statistics, and their applications in a variety of practical and theoretical contexts. Units 3 and 4 consist of the areas of study 'Algebra, number and structure', 'Data analysis, probability and statistics', 'Calculus', and 'Functions, relations and graphs'.

Area of Study 1: Functions, relations and graphs

Area of Study 2: Algebra, number and structure

Area of Study 3: Calculus

Area of Study 4: Data analysis, probability and statistics

### Outcome 1

On completion of this unit the student should be able to define and explain key concepts as specified in the content from the areas of study and apply a range of related mathematical routines and procedures.

### Outcome 2

On completion of this unit the student should be able to apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

### Outcome 3

On completion of this unit the student should be able to apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.





## Mathematics: Specialist Mathematics

Units 3 and 4

Specialist Mathematics Units 3 and 4 consist of the areas of study: 'Algebra, number and structure', 'Calculus', 'Data analysis, probability and statistics', 'Discrete mathematics', 'Functions, relations and graphs', and 'Space and measurement'. The development of course content should highlight mathematical structure, reasoning and proof and applications across a range of modelling contexts with an appropriate selection of content for each of Unit 3 and Unit 4. The selection of content for Unit 3 and Unit 4 should be constructed so that there is a balanced and progressive development of knowledge and skills with connections among the areas of study being developed as appropriate across Unit 3 and Unit 4.

### Area of Study 1 – Discrete mathematics: Logic and proof

In this area of study students cover the development of mathematical argument and proof. This includes conjectures, connectives, quantifiers, examples and counter-examples, and proof techniques including mathematical induction. Proofs will involve concepts from topics such as: divisibility, inequalities, graph theory, combinatorics, sequences and series including partial sums and partial products and related notations, complex numbers, matrices, vectors and calculus. The concepts, skills and processes from this area of study are to be applied in the other areas of study.

### Area of Study 2 – Functions, relations and graphs

In this area of study students cover rational functions and other simple quotient functions, curve sketching of these functions and relations, and the analysis of key features of their graphs including intercepts, asymptotic behaviour and the nature and location of stationary points and points of inflection and symmetry.

### Area of Study 3 – Algebra, number and structure: Complex numbers

In this area of study students cover the algebra of complex numbers, including polar form, factorisation of polynomial functions over the complex field and an informal treatment of the fundamental theorem of algebra.

### Area of Study 4 – Calculus

In this area of study students cover the advanced calculus techniques for analytical and numerical differentiation and integration of a broad range of functions, and combinations of functions; and their application in a variety of theoretical and practical situations, including curve sketching, evaluation of arc length, area and volume, differential equations and kinematics, and modelling with differential equations drawing from a variety of fields such as biology, economics and science.

### Area of Study 5 – Space and measurement

In this area of study students cover the arithmetic and algebra of vectors; linear dependence and independence of a set of vectors; proof of geometric results using vectors; vector representation of curves in the plane and their parametric and Cartesian equations; vector kinematics in one, two and three dimensions; vector, parametric and Cartesian equations of lines and planes.



# Dare, Connect, Learn.



## Outdoor & Environmental Studies

### Unit 3 – Relationships with outdoor environments

The focus of this unit is the ecological, historical and social contexts of relationships between humans and outdoor environments in Australia. Case studies of a range of impacts on outdoor environments are examined in the context of the changing nature of human relationships with outdoor environments in Australia.

Students consider a number of factors that influence relationships with outdoor environments. They also examine the dynamic nature of relationships between humans and their environment.

Students are involved in one or more experiences in outdoor environments, including in areas where there is evidence of human interaction. Through these practical experiences students are able to make comparisons between and to reflect upon outdoor environments, as well as to develop theoretical knowledge and skills about specific natural environments.

### Unit 4 – Sustainable outdoor relationships

In this unit students explore the sustainable use and management of outdoor environments. They examine the contemporary state of environments in Australia, consider the importance of healthy outdoor environments, and examine the issues relating to the capacity of outdoor environments to support the future needs of the Australian population.

Students examine the importance of developing a balance between human needs and the conservation of outdoor environments and consider the skills needed to be environmentally responsible citizens. They investigate current acts and conventions as well as management strategies for achieving and maintaining healthy and sustainable environments in contemporary Australian society.

Students engage in one or more related experiences in outdoor environments. They learn and apply the practical skills and knowledge required to sustain healthy outdoor environments, and evaluate the strategies and actions they employ. Through these practical experiences students are able to make comparisons between and to reflect upon outdoor environments, as well as to develop and apply theoretical knowledge about outdoor environments.

### Special Requirements

The cost for the subject is approximately \$600.00 for the year. This will cover all activity costs for multiple excursions and camps. Students will be required to participate in a variety of outdoor field trips and camps throughout the year. Trips may include snow camps, hiking, surfing, snorkeling, canoeing and mountain biking.

\*\* Please note that it is a requirement of the subject that you must participate in ALL activities associated with the study in order to gain a satisfactory result for the subject unless medical unfit.







## Physical Education

### Unit 3: Movement skills and energy for physical activity

This unit introduces students to the biomechanical and skill acquisition principles used to analyse human movement skills and energy production from a physiological perspective. Students use a variety of tools and techniques to analyse movement skills and apply biomechanical and skill acquisition principles to improve and refine movement in physical activity, sport and exercise. They use practical activities to demonstrate how correct application of these principles can lead to improved performance in physical activity and sport. Students investigate the relative contribution and interplay of the three energy systems to performance in physical activity, sport and exercise.

#### Area of Study 1: How are movement skills improved?

Outcome 1: On completion of this unit the student should be able to collect and analyse information from, and participate in, a variety of physical activities to develop and refine movement skills from a coaching perspective.

#### Area of Study 2: How does the body produce energy?

Outcome 2: On completion of this unit the student should be able to use data collected in practical activities to analyse how the major body and energy systems work together to enable movements to occur, and explain the factors causing fatigue and suitable recovery strategies.

### Unit 4: Training to improve performance

In this unit students analyse movement skills from a physiological, psychological and sociocultural perspective, and apply relevant training principles and methods to improve performance within physical activity at an individual, club and elite level. Improvements in performance, in particular fitness, depend on the ability of the individual and/or coach to gain, apply and evaluate knowledge and understanding of training. Students analyse skill frequencies, movement patterns, heart rates and work to rest ratios to determine the requirements of an activity. Students consider the physiological, psychological and sociological requirements of training to design and evaluate an effective training program. Students participate in a variety of training sessions designed to improve or maintain fitness and evaluate the effectiveness of different training methods.

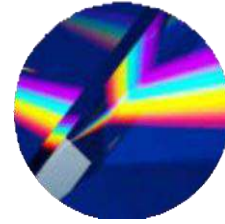
#### Area of Study 1: What are the foundations of an effective training program?

Outcome 1: On completion of this unit the student should be able to analyse data from an activity analysis and fitness tests to determine and assess the fitness components and energy system requirements of the activity.

#### Area of Study 2: How is training implemented effectively to improve fitness?

Outcome 2: On completion of this unit the student should be able to participate in a variety of training methods, and design and evaluate training programs to enhance specific fitness components.





## Physics

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### Unit 3

In this unit students use Newton's laws to investigate motion in one and two dimensions. They explore the concept of the field as a model used by physicists to explain observations of motion of objects not in apparent contact. Students compare and contrast three fundamental fields – gravitational, magnetic and electric – and how they relate to one another.

Area of Study 1: How do physicists explain motion in two dimensions?

In this area of study, students use Newton's laws of motion to analyse linear motion, circular motion and projectile motion. They explore the motion of objects under the influence of a gravitational field on the surface of Earth, close to Earth and above Earth.

Area of Study 2: How do things move without contact?

In this area of study, students examine the similarities and differences between three fields: gravitational, electric and magnetic. Students explore how positions in fields determine the potential energy of, and the force on, an object.

Area of Study 3: How are fields used in electricity generation?

In this area of study, students use empirical evidence and models of electric, magnetic and electromagnetic effects to explain how electricity is produced and delivered to homes.

### Unit 4

In this unit, students explore some monumental changes in thinking in Physics that have changed the course of how physicists understand and investigate the Universe. They examine the limitations of the wave model in describing light behaviour and use a particle model to better explain some observations of light. Students are challenged to think beyond how they experience the physical world of their everyday lives to thinking from a new perspective, as they imagine the relativistic world of length contraction and time dilation when motion approaches the speed of light.

Area of Study 1: How has understanding about the physical world changed?

In this area of study, students learn how understanding of light, matter and motion have changed over time. They explore how major experiments led to the development of theories to describe these fundamental aspects of the physical world.

Area of Study 2: How is scientific inquiry used to investigate fields, motion or light?

Students undertake a student-designed scientific investigation in either Unit 3 or Unit 4, or across both Units 3 and 4. The investigation involves the generation of primary data relating to fields, motion or light.





## Psychology

### Unit 3

In this unit students investigate the contribution that classical and contemporary research has made to the understanding of the functioning of the nervous system and to the understanding of biological, psychological and social factors that influence learning and memory.

Area of Study 1: How does the nervous system enable psychological functioning?

In this area of study students explore the role of different branches of the nervous system in enabling a person to integrate, coordinate and respond to internal and external sensory stimuli. Students apply their understanding of neurotransmitters in the transmission of neural information across a neural synapse to produce excitatory and inhibitory effects and explore the effect that neuromodulators have on brain activity.

Area of Study 2: How do people learn and remember?

Students explore memory as the process by which knowledge is encoded, stored and later retrieved, as illustrated by Richard Atkinson and Richard Shiffrin's multi-store model of memory. Students explore the interconnectedness of brain regions in storing explicit and implicit memories and the role of semantic and episodic memory in cognition.

### Unit 4

In this unit students explore the demand for sleep and the influences of sleep on mental wellbeing. They consider the biological mechanisms that regulate sleep and the relationship between rapid eye movement (REM) and non-rapid eye movement (NREM) sleep across the life span. Students consider ways in which mental wellbeing may be defined and conceptualised, including social and emotional wellbeing (SEWB) as a multidimensional and holistic framework to wellbeing.

Area of Study 1: How does sleep affect mental processes and behaviour?

In this area of study students focus on sleep as an example of an altered state of consciousness and the different demands humans have for sleep across the life span. They compare REM and NREM sleep as examples of naturally occurring altered states of consciousness and investigate the biological mechanisms of the sleep-wake cycle in terms of the timing of sleep, what causes individuals to be sleepy at night and why individuals wake when required.

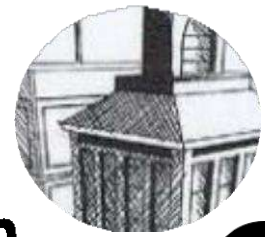
Area of Study 2: What influences mental wellbeing?

In this area of study students explore mental wellbeing in terms of social and emotional wellbeing, levels of functioning, and resilience to cope with and manage change and uncertainty. Students investigate the concept of mental wellbeing as a continuum, recognising that an individual's mental wellbeing is influenced by the interaction of internal and external factors and fluctuates over time.

Area of Study 3: How is scientific inquiry used to investigate mental processes and psychological functioning?

Students undertake a student-designed scientific investigation in either Unit 3 or Unit 4, or across both Units 3 and 4. The investigation involves the generation of primary data relating to mental processes and psychological functioning. The investigation draws on knowledge and related key science skills developed across Units 3 and 4 and is undertaken by students in the laboratory and/or the field.





## Visual Communication & Design

### Unit 3 – Visual communication design practices

In this unit students gain an understanding of the process designers employ to structure their thinking and communicate ideas with clients, target audiences, other designers and specialists. Through practical investigation and analysis of existing visual communications, students gain insight into how the selection of methods, media and materials, and the application of design elements and design principles, can create effective visual communications for specific audiences and purposes. They investigate and experiment with the use of manual and digital methods, media and materials to make informed decisions when selecting suitable approaches for the development of their own design ideas and concepts.

Students use their research and analysis of the process of visual communication designers to support the development of their own designs. They establish a brief for a client and apply design thinking through the design process. They identify and describe a client, two distinctly different needs of that client, and the purpose, target audience, context and constraints relevant to each need.

Design from a variety of historical and contemporary design fields is considered by students to provide directions, themes or starting points for investigation and inspiration for their own work. Students use observational and visualisation drawings to generate a wide range of design ideas and apply design thinking strategies to organise and evaluate their ideas. The brief and research underpin the developmental and refinement work undertaken in Unit 4.

### Unit 4 – Visual communication design development, evaluation and presentation

The focus of this unit is on the development of design concepts and two final presentations of visual communications to meet the requirements of the brief. This involves applying the design process twice to meet each of the stated communication needs.

Having completed their brief and generated ideas in Unit 3, students continue the design process by developing and refining concepts for each communication need stated in the brief. They utilise a range of digital and manual two- and three-dimensional methods, media and materials. They investigate how the application of design elements and design principles creates different communication messages and conveys ideas to the target audience.

As students revisit stages to undertake further research or idea generation when developing and presenting their design solutions, they develop an understanding of the iterative nature of the design process. Ongoing reflection and evaluation of design solutions against the brief assists students with keeping their endeavours focused.

