JOHN MONASH
SCIENCE SCHOOL

2027

Orientation HANDBOOK

Your guide to teaching and learning at Victoria's first specialist secondary school for science, mathematics and associated technologies



JOHN MONASH
SCIENCE SCHOOL

2027

Orientation
HANDBOOK

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Monash University, Clayton Campus
Clayton VIC 3800

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john.monash.ss@education.vic.gov.au

WWW.JMSS.VIC.EDU.AU


Exercise: Weather Data
JOHN MONASH
SCIENCE SCHOOL

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Orientation Handbook

This handbook is your guide to teaching and learning at John Monash Science School – Victoria's first specialist secondary school for science, mathematics and associated technologies. Within the Department of Education JMSS is known as a Designated Purpose School for High Ability students.

This guide contains important information for students, parents and families as they prepare to enter our classrooms and join our school community. We hope you will find this handbook a valuable and insightful resource, as you begin your studies here at John Monash Science School.

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Section One:
GENERAL INFORMATION



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Section One: GENERAL INFORMATION

1.1 WELCOME

Welcome to John Monash Science School.
Since opening to senior students in 2010, John Monash Science School (JMSS) has quickly become one of Victoria's most innovative and highest performing Government schools.

As the state's first specialist senior secondary school focusing on science, mathematics and associated technologies, our school is unique within Australia, and we would like to congratulate each student on being selected as part of our new cohort of Year 10 and Year 11 students. Within the Victorian Government Education System, JMSS is classified as a Designated Purpose School for High Ability students.

We cater for curious students who are problem solvers with a real passion and interest in science, and we proudly offer a curriculum co-constructed with academics from Monash University, along with a broad range of elective and extension subjects that utilise our state-of-the-art facilities and take full advantage of our position on Monash University's Clayton campus.

The purpose of this handbook is to provide students and parents with information about how the school will operate and the subjects that will be offered to students in 2027.

It is essential that students plan carefully and make informed decisions that enable them to meet both their personal and academic goals into the future.

Students should choose subjects that:

- they have an interest in;
- they may need for future courses (prerequisites);
- allow them to maintain and develop their own special skills and talents.

We realise that subject selection can sometimes be a difficult and daunting task. If you would like more information, or have any queries about any aspect of the programs offered at this school, please contact us.

Our website has our most up-to-date information, including articles, photos and videos. You can also see our school calendar of events.

1.2 *School* CONTACT INFORMATION

Physical Address
39 Innovation Walk
Monash University VIC 3800

Additional information sometimes required for GPS navigation:

1 Wellington Road, Clayton VIC

Postal Address
PO Box 8016
Monash University VIC 3800

Phone Numbers

School Office

(03) 9905 1002 john.monash.ss@education.vic.gov.au

Attendance/Absences

(03) 9905 1002 absences@jmss.vic.edu.au

Key Staff

Principal

Andrew Chisholm
andrew.chisholm@jmss.vic.edu.au

Assistant Principals

Melanie Denney
melanie.denney@jmss.vic.edu.au

TBC

Business Manager

Corey Goodes
corey.goodes@jmss.vic.edu.au

1.3 *Timetables and* TERM DATES

1.3A School Day

All students will need to be at school by 8.20am each day. Lessons begin at 8.40am.

School finishes at 3.20pm each day except Wednesday, when school will finish at 3.30pm to accommodate subjects in our Co-Curricular Program.

1.3B School Terms

John Monash Science School follows a common four-term school year, closely aligned to the Term Dates published by the Victorian Department of Education and Training.

Please Note:

* The first day of school for students will be the Thursday 28th January:

Victorian School dates show the 27th January but JMSS has a professional practice day for staff on Wednesday 27th January.

School Term Dates - 2027		
Term One	**28 January * students' first day back for 2027**	**25 March**
Holidays	26 March	11 April
Term Two	**12 April**	**25 June**
Holidays	26 June	11July
Term Three	**12 July**	**17 September**
Holidays	18 September	03 October
Term Four	**04 October**	**17 December**
Holidays	18 December	26 January

Term Dates and Holiday Periods for 2027 and beyond in all Victorian Government Schools are listed on the Victorian Department of Education website.

1.3C Timetables

10-Day Cycle

The school operates on a 10-day cycle, with an alternating structure on Fridays.

Each day is broken into five 60-minute teaching and learning periods, with a short break between Periods 2 and 3 for recess, and a longer break between Periods 4 and 5 for lunch.

Timetable Structures

Most days, John Monash Science School follows the regular timetable with two exceptions: Wednesdays, and Fridays that accommodate a school assembly.

Regular Timetable (Days 1+6/ 2+7/ 4+9/ 5)		
Description	**Time**	**Duration**
Period 1	**8.40 - 9.40**	**1 Hour**
Period 2	**9.40 - 10.40**	**1 Hour**
Recess	10.40 - 11.05	25 Minutes
Mentor	11.05 - 11.20	15 Minutes
Period 3	**11.20 - 12.20**	**1 Hour**
Period 4	**12.20 - 13.20**	**1 Hour**
Lunch	13.20 - 14.20	1 Hour
Period 5	**14.20 - 15.20**	**1 Hour**

Wednesday (Days 3 +8)		
Period 1	**8.40 - 9.40**	**1 Hour**
Period 2	**9.40 - 10.40**	**1 Hour**
Recess	10.40 - 11.00	20 Minutes
Period 3	**11.00 - 12.00**	**1 Hour**
Period 4	**12.00 - 13.00**	**1 Hour**
Lunch	13.00 - 13.40	40 Minutes
Co-Curricular	**13.40 - 15.30**	**1.5 Hours**

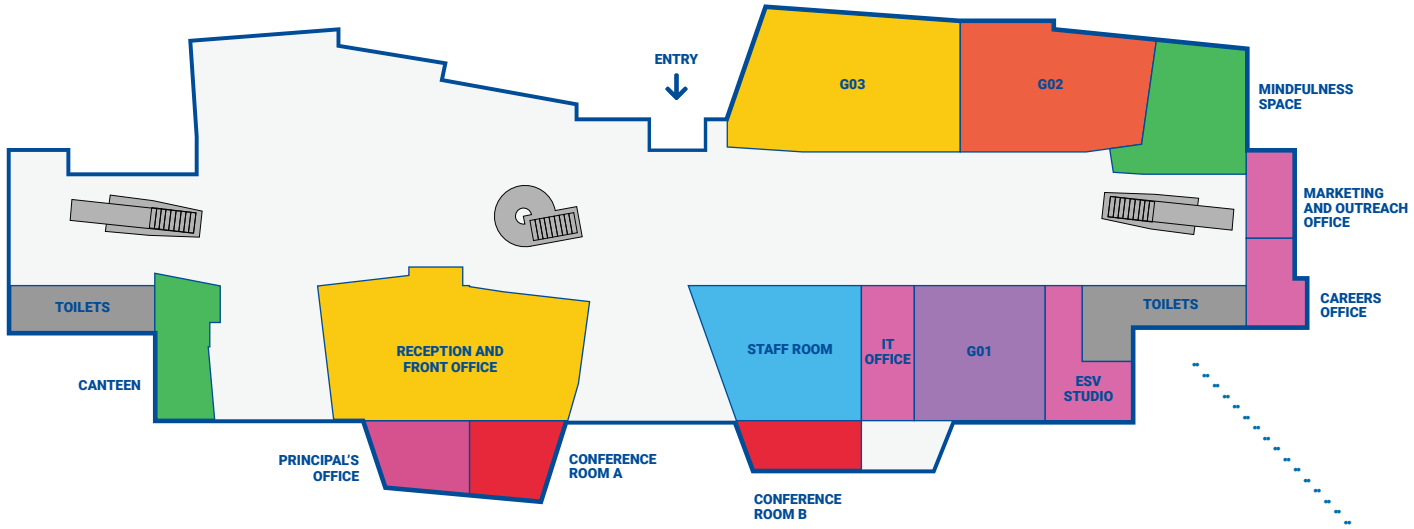
Friday + Assembly (Days 10)		
Mentor	8.40 - 8.55	15 Minutes
Assembly	**8.55 - 9.55**	**1 Hour**
Period 2	**9.55 - 10.55**	**1 Hour**
Recess	10.55 - 11.20	25 Minutes
Period 3	**11.20 - 12.20**	**1 Hour**
Period 4	**12.20 - 13.20**	**1 Hour**
Lunch	13.20 - 14.20	1 Hour
Period 5	**14.20 - 15.20**	**1 Hour**

1.4

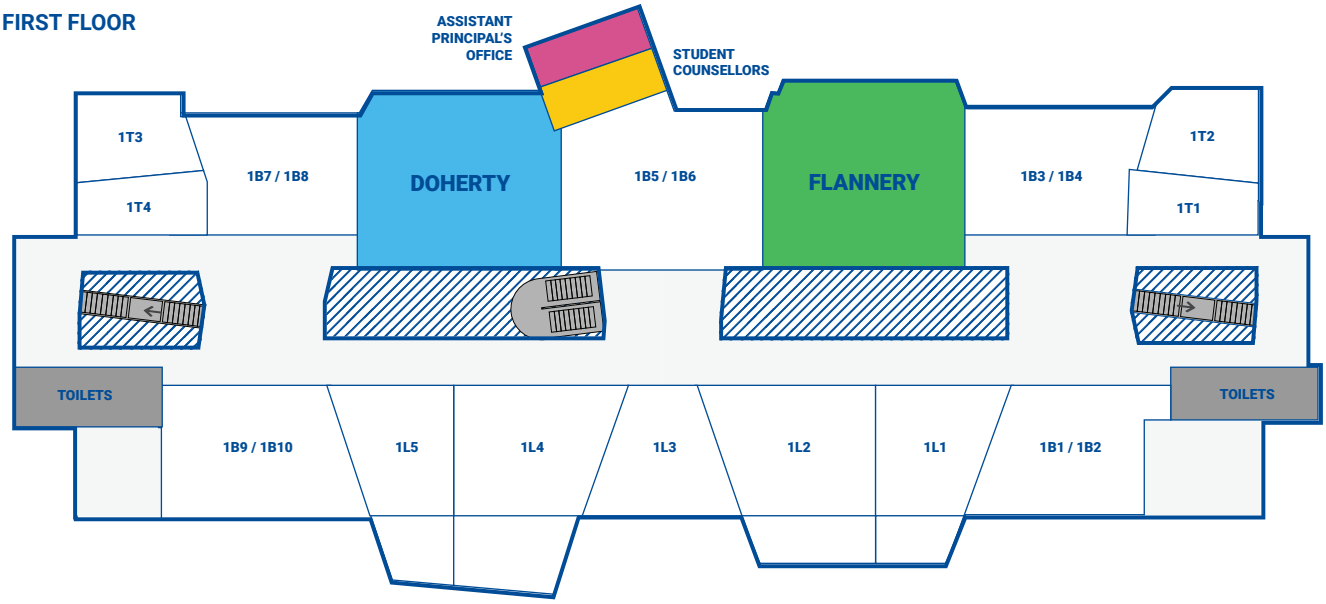
Floor Plan
JOHN MONASH SCIENCE SCHOOL

NORTH

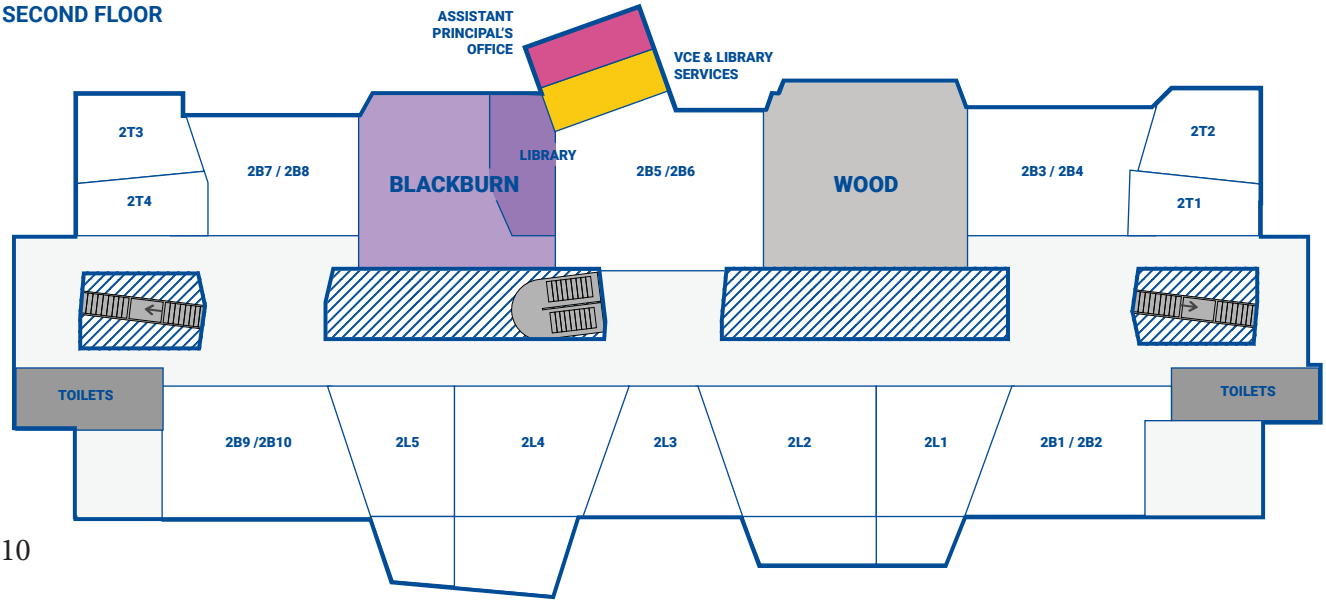
GROUND FLOOR

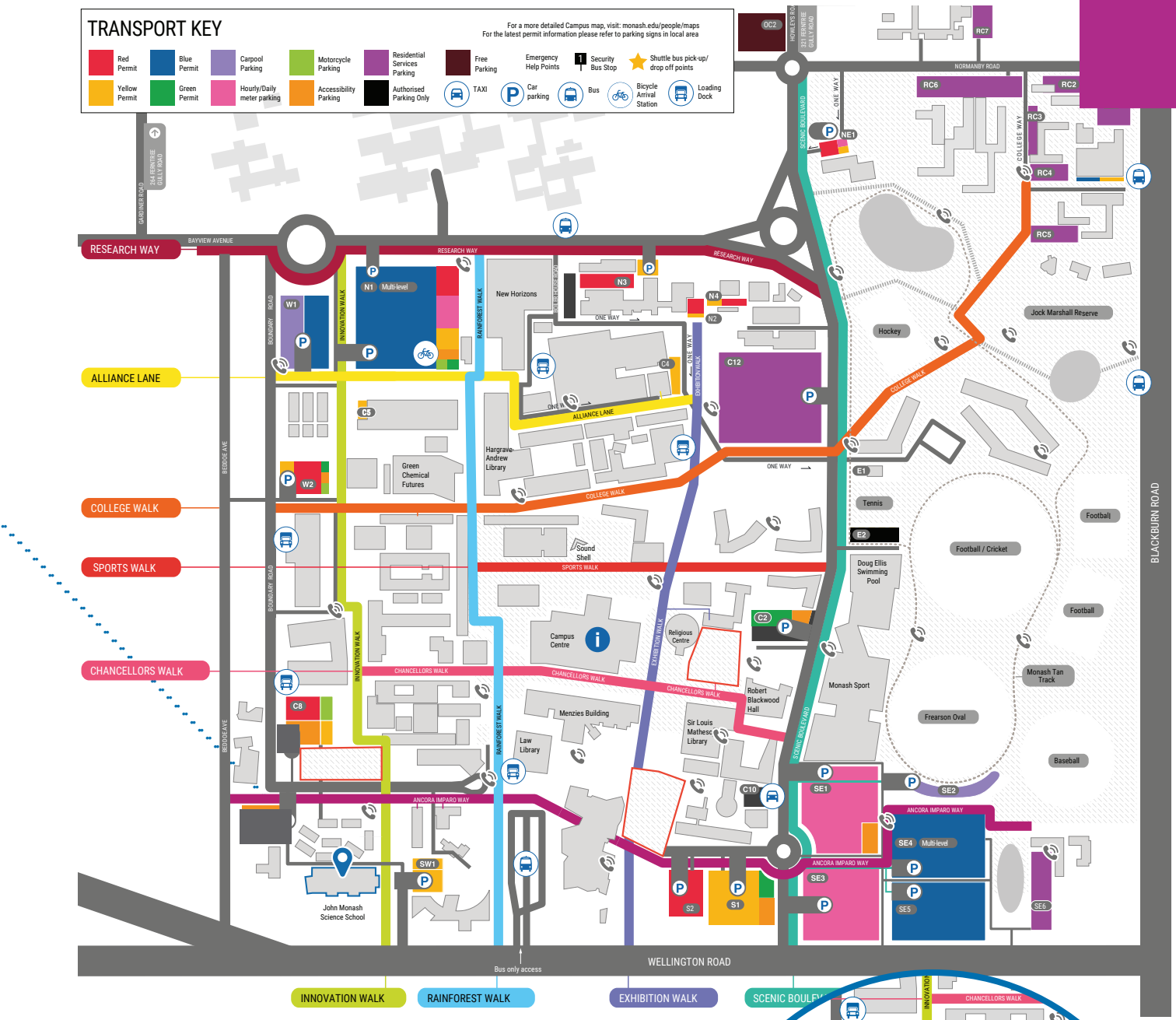


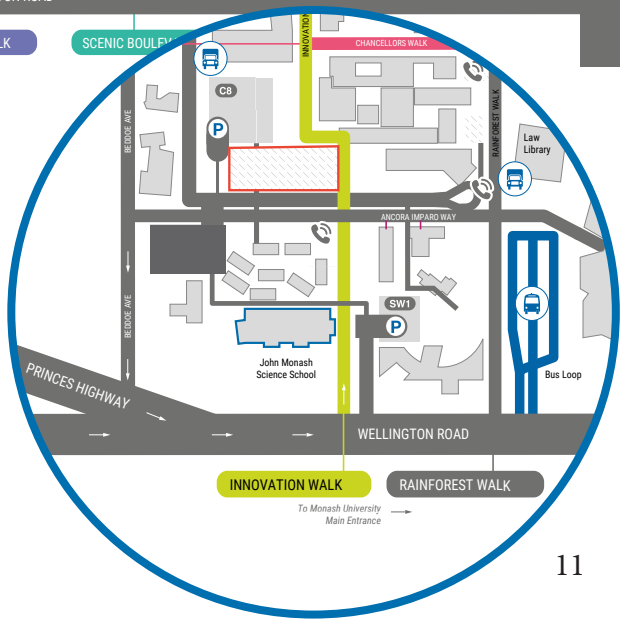
FIRST FLOOR



SECOND FLOOR







1.4A Location and Transport

John Monash Science School is on the Clayton campus of Monash University, in Melbourne's south-eastern suburbs

The University is well-served by public transport, with regular buses from each of Ormond, Huntingdale, Clayton and Blackburn Railway Stations.

The majority of bus routes servicing the Clayton campus arrive at the Monash University central bus loop, approximately 200m from John Monash Science School.

1.5 *School* FACILITIES

1.5A Building

JMSS is one building with 3 floors (ground, first floor and second floor). Many of our classrooms are open plan, accommodating up to 50 students and 2 teachers. Most classes at JMSS are team taught. Modern science labs with specialist equipment cater for single or team classes, and there are many study areas available for private and group study.

JMSS is wirelessly networked throughout the building and in some outside areas, allowing for anywhere, anytime learning. Students are allocated a locker, and are encouraged to keep lockers locked for personal security, and walkways clear of objects.

We run our Music program in a facility hired from Monash University that backs onto the school, while our Sport and Physical Education programs utilise both an outdoor basketball court located on the school grounds, and multi-purpose indoor and outdoor facilities hired through Monash Sport.

1.5B Environment

There is a major sustainability focus in the day-to-day operations of the school. The building itself has a high-level environmentally sustainable design including rainwater harvesting, double glazing, hydronic heating and cooling and sub floor ventilation.

We are also keen to ensure all waste is kept to a minimum and recycled whenever possible. Blue bins are for paper and cardboard, yellow bins are for mixed recyclables, and red bins are for general waste.

1.5C Café

Our café is on the ground floor, offering a range of cold drinks, snacks and hot and cold lunch options, open during recess and lunch times. Students can also submit lunch orders in the morning for pick-up at lunch time.

The café is operated by the school and complies with health and safety standards. These standards cater for all cultural and dietary requirements. The café uses ceramic plates and bowls, and metal cutlery, rather than plastic disposable utensils, and students are responsible for returning these to the cafe. Students also have access to kitchenettes in their house areas, including filtered hot and cold water, and microwave access. Students are responsible for keeping these areas clean. EFTPOS is preferred.

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Café Payments Using Compass

In addition to cash and EFTPOS, items from our café can also be ordered and paid for using Compass.

1.5D eLibrary

JMSS maintains a library to support students with their studies, school programs and personal reading. This includes print resources as well as a large eResource collection.

The e-resource collection supports the school's electronic preferred strategy, borrowing from the trend in higher education to provide electronic resources to students where possible. Our e-resources include collections of both non-fiction and fiction eBooks as well as databases for research and personal interest. These eResources are accessible at any time on laptops, tablets and smartphones and students have quick and easy access to them from the student portal and the Library Resource Centre website.

Student engagement with the library includes such resources as:

- support navigating our eResources and collections
- reference queries and resource requests welcome
- an active student book club

Where a hardcopy, app, subscription or eBook is the best available for a subject and will be used extensively by students, it will be listed for purchase on the school book and app list which is issued in late November each year.

The easiest access to our list of Databases for students throughout 2027 will be through the JMSS Student Portal

(please note students will only have access in 2027 and all year 10 students have a discovery session regarding navigating these databases):

STUDENT PORTALS

1.5E Parking

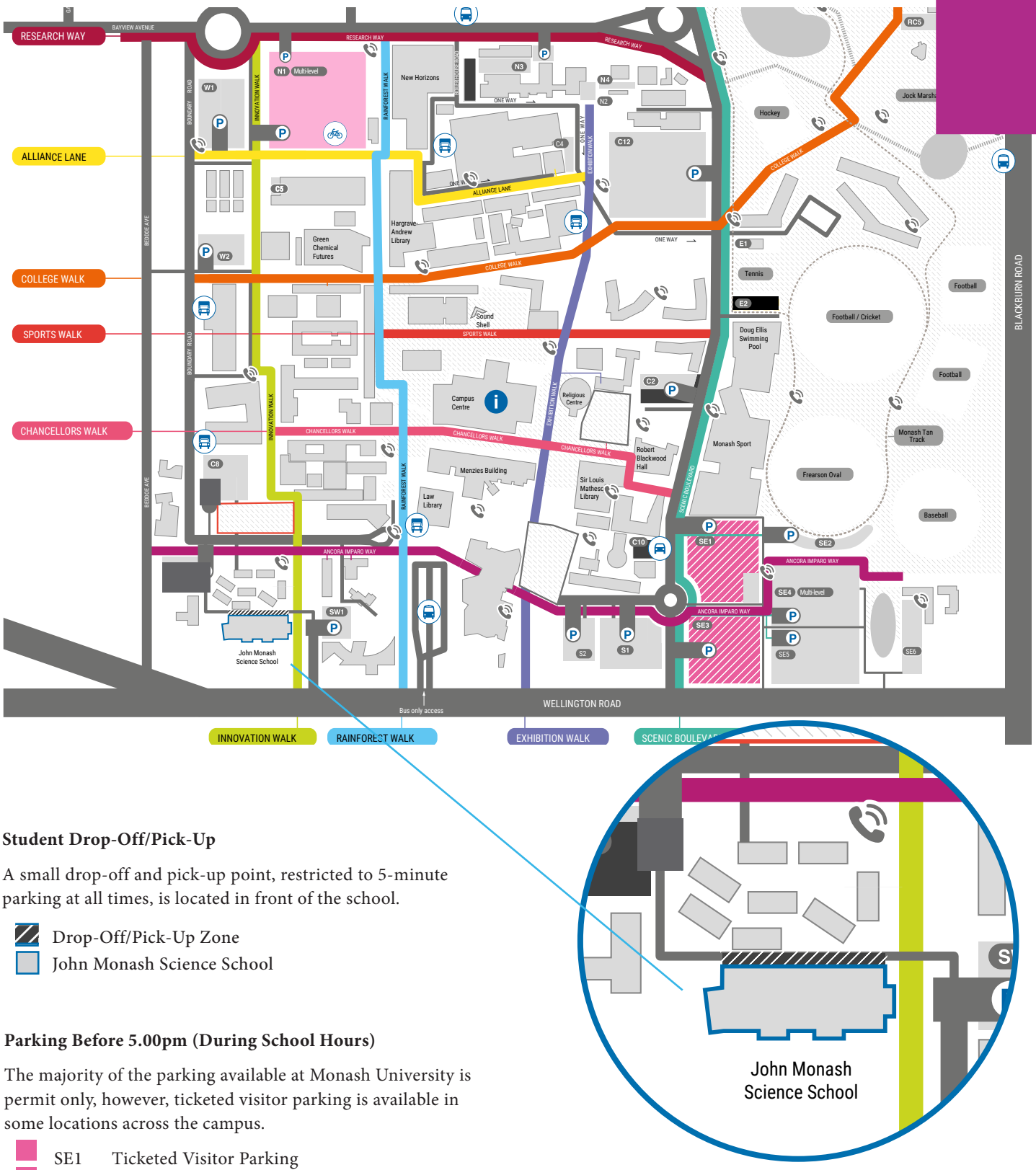
There is a 5-minute drop-off zone at the front (North side) of JMSS, but no parking available near the building between 7:30am and 5pm, Monday to Friday (red permits and childcare parking only).

If you are dropping off students in the morning it is often easier to do the drop off at the adjacent streets such as Beddoe Ave, due to the morning traffic congestion. Please do not use childcare centre car park.

If you are coming to an event at JMSS, please park in ticket parking areas shown on the Monash University map (see also next page), and purchase a ticket for the duration of your stay. You will need to allow 10 minutes to walk from the ticket parking areas to JMSS.

1.5

Parking at JOHN MONASH SCIENCE SCHOOL



Student Drop-Off/Pick-Up

A small drop-off and pick-up point, restricted to 5-minute parking at all times, is located in front of the school.

- Drop-Off/Pick-Up Zone
- John Monash Science School

Parking Before 5.00pm (During School Hours)

The majority of the parking available at Monash University is permit only, however, ticketed visitor parking is available in some locations across the campus.

SE1	Ticketed Visitor Parking
SE3	Ticketed Visitor Parking
N1	Ticketed Visitor Parking (Undercover)

Parking After 5.00pm

Permit parking ends at 5.00pm. Visitors to the school may park in any indicated parking area after this time.

P Parking Areas

1.6 *School* UNIFORM

1.6A Compulsory School Uniform

JMSS is a proud uniform school, with both a Summer and Winter uniform, as well as a Sports uniform.

PSW is the school supplier and the closest PSW outlet to JMSS is at Mount Waverley. It is advisable to order uniforms as early as possible, to ensure you receive the right size at the appropriate time.

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PSW Waverley

342-350 Springvale Rd,
Glen Waverley VIC 3150
(03) 9768 0335
waverley@psw.com.au
www.psw.com.au

Tuesday – Friday	9:00am - 5:00pm
Saturday	10:00am - 1:00pm

Students are required to wear complete school uniform when travelling to and from school and on all excursions.

The wearing of school uniform is compulsory for all students from Year 10 to Year 12. A blazer must be worn as the outer garment during Terms 2 and 3, to and from school, and on all school excursions and assemblies, unless otherwise advised.

Students are required to wear a complete version of the uniform.

Students are not permitted to wear a combination of school uniform and sport uniform (for example, the rugby jumper nor the spray jacket must not be worn as a substitute for the blazer).

Sandshoes, sneakers, and other sports shoes must be worn in PE / Sport classes, and may be worn in the yard at recess and lunchtime for the purposes of playing games, but they are not acceptable as a replacement for school shoes at other times.

Only formal-style flat-heeled, fully enclosed, black leather shoes are to be worn. Sandals and T-Bars are not permitted due to safety requirements in labs.

Rugby tops may be worn in Sports / PE sessions and during some incursions into Monash University. Students are strongly advised to wear hats outside and at sport for sun protection. Sports / PE uniform must be worn for all Sports / PE classes.

You can find out more information about the uniform on our website, including our Uniform Appearance policy.

Seasonal School Uniform Guide

<table>
<tr><th>Summer (Terms 1+4)
Seasonal guidelines only</th><th>Winter (Terms 2+3)
Seasonal guidelines only</th></tr>
<tr><td>JMSS Summer Dress</td><td>JMSS Winter Skirt</td></tr>
<tr><td>or</td><td>or</td></tr>
<tr><td>Grey tailored pleated JMSS shorts</td><td>Plain grey tailored long pants</td></tr>
<tr><td rowspan="3">Collared short-sleeve shirt (with embroidered JMSS logo)</td><td>Collared white tailored shirt or long-sleeved business shirt to be worn tucked-in.

The shirt is to be worn with JMSS tie.</td></tr>
<tr><td>JMSS navy woollen jumper with JMSS embroidered emblem.</td></tr>
<tr><td colspan="2">JMSS Blazer with JMSS embroidered logo to be worn as an outer garment.</td></tr>
<tr><td>Black leather laced-up shoes – fully enclosed and flat-heeled</td><td>Black leather laced-up shoes – fully enclosed and flat-heeled.</td></tr>
<tr><td rowspan="3">White or grey socks.</td><td>Knee-high navy socks / navy tights
(for wearing of skirt)</td></tr>
<tr><td>or</td></tr>
<tr><td>Grey crew socks
(for wearing of pants).</td></tr>
<tr><td colspan="2">Sandals / T-Bars are not permitted due to safety requirements</td></tr>
</table>

Sports Uniform Guide (Year-Round)

JMSS Sports Top	JMSS Spray Jacket
JMSS Microfibre Sports Shorts	JMSS Baseball Cap (with logo)
JMSS Rugby Jumper (with logo)	JMSS Microfibre Tracksuit Pants

1.6

Uniform Components
JOHN MONASH SCIENCE SCHOOL

Winter Uniform



Blazer



College Tie



Tailored Trousers



Long-Sleeve Shirt



Wool Blend Jumper



Blouse



Pleated Skirt

Summer Uniform



Dress



Short-Sleeve Shirt



Tailored Shorts

Accessories



Lab Coat



Safety Glasses



College Bag

Sports Uniform



Spray Jacket



Sports Polo



Rugby Jumper



Track Pants



Sports Shorts



Cap

Lost Property

Please label all uniforms, books and personal items.

All Lost Property is stored at the JMSS Office, and if your name is on the item you will be emailed to collect it. If it is not labelled it will still be stored. Anything left at the end of every term is donated to charity.

1.6A **PSW**

JMSS School Uniform can be purchased through PSW

- Link to PSW online shop for JMSS page

<https://www.psw.com.au/>

1.6B **Second-Hand Uniform**

The Sustainable School Shop can be used to buy and sell second-hand books and uniforms. This is a simple, user-friendly service for the education community which recycles goods through an online trading portal.

http://www.sustainableschoolshop.com.au/

Through this service, uniforms, books, calculators, musical instruments and more can be traded between parents all year round on a system that is similar to Gumtree.

Parents register online to use the service at a cost of $19.95 per annum or $1.00 per ad. Ads are placed for “For Sale” items and for “Wanted” items using a simple tick box system. Visit the “Second-Hand Uniform” page on our website for more information.

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2.1 - 2.9

Section Two:

STUDENT ADMINISTRATION AND MANAGEMENT



2.1
2.1 - 2.9

Section Two: STUDENT ADMINISTRATION AND MANAGEMENT

2.1 CONTACT *with* THE SCHOOL

Parents can support student learning in a number of ways.

Our school website is designed to help keep our school community informed and connected, and is intended to be the first point of reference for parents.

Parents can use the school website to:

- Keep in touch with the school via our website showing events, articles and photos;
- View the school calendar;
- Use the form located on our 'Contact' page to direct enquiries to the most relevant member of our teaching, administrative and educational support staff; and,
- Connect with the official school accounts on social media (Facebook, LinkedIn and YouTube) for more casual updates on daily life at JMSS.

The school website can be found by visiting: *www.jmss.vic.edu.au*

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John Monash Science School Website

Our school website is a valuable source of information for both parents and students.

We recommend adding the website to the 'Bookmarks' or 'Frequently Visited' list in your regular internet browser.

The school website can be found at: www.jmss.vic.edu.au

2.2 COMPASS

2.2A Access, Usage and Expectations

Compass is a web-based portal to access many sites and services at JMSS.

Parents will receive a login, and students will also have a login. It is important not to share your login details with anyone, including your family members.

When logged in to Compass parents can:

- see news items and alerts;
- pay curriculum contributions;
- order School Photos;
- monitor attendance;
- monitor learning progress and view and print Progress Reports (notified when available);
- view availability and book parent-teacher-student conferences;
- change your password;
- access excursion forms and payment forms;
- pay for excursions and extra-curricular activities;
- order replacement Compass Identity cards;
- view end of semester reports.

When logged in to Compass students can:

- read news and alerts;
- view timetables and see any class or room changes;
- check any events they need to attend;
- reprint lost excursion forms;
- access resources such as online handbooks and subject sites;
- order food from the Canteen.

It is expected both parents and students will access Compass on a regular basis. Parents are expected to check Compass weekly, while students are expected to check Compass on a daily basis.

Your Compass login and PIN details will be issued to you at the end of 2026.

If you cannot login to the portal you should contact the JMSS Office to have your PIN reset.

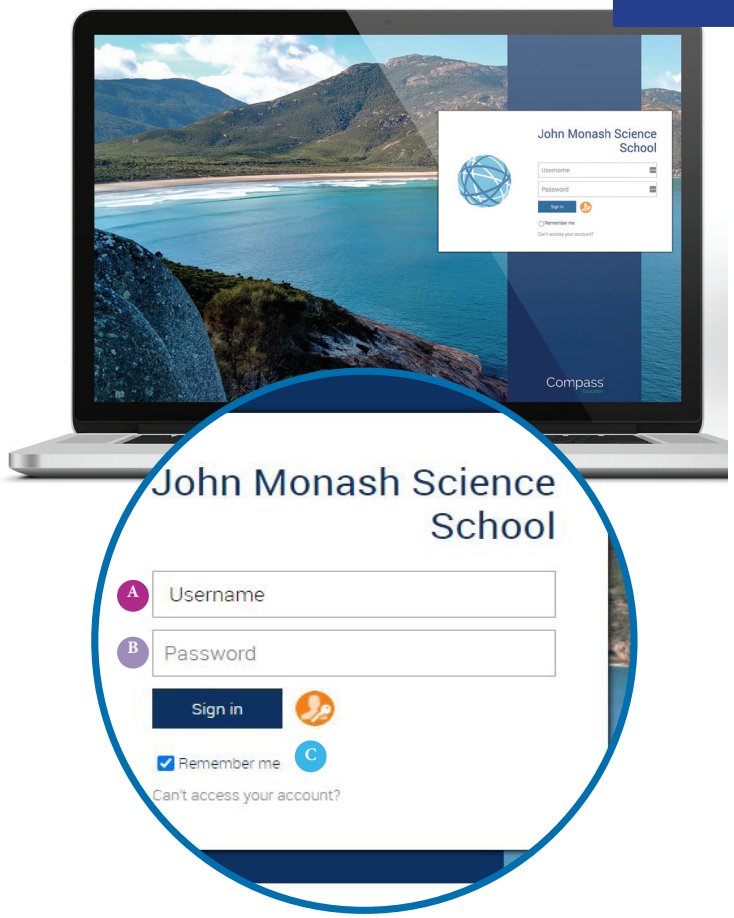
To access Compass, please visit: *https://jmss-vic.compass.education*

2.2 *Compass Usage Guide* JOHN MONASH SCIENCE SCHOOL

Compass

Updates and important information are often published through Compass - our school's student management platform.

Compass can be accessed by visiting: http://jmss-vic.compass.education



Compass provides a fast, secure and hassle-free way to confirm and pay for your child's excursions.

Compass logins and passwords will be issued to you individually at the end of 2026.

1 Login to the Compass Portal

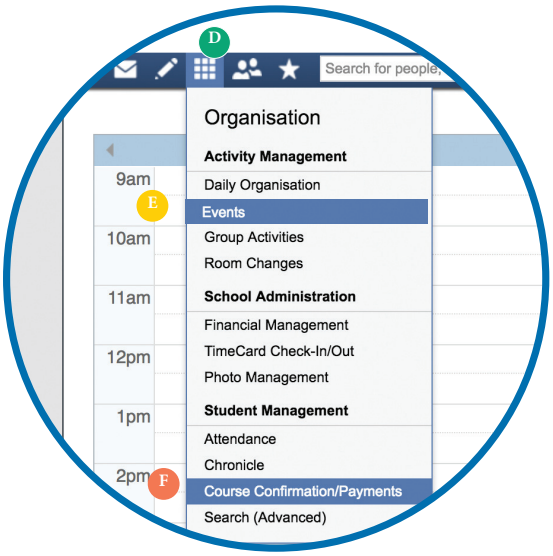
Visit https://jmss-vic.compass.education and log into the Compass Parent Portal using your parent login details. A B

If you can't remember your login details,you can access your account by clicking "Can't access your account?". C

2 Viewing/Paying for Upcoming Events

Once logged in, for upcoming events and excursions, navigate to 'Events' E via the "Organisation" D tab on the top ribbon.

Click the red 'Process Now" button to provide consent and/or payment (Depending upon what the event requires).



3 Viewing/Paying Curriculum Contributions

A comprehensive guide is available on the JMSS website: www.jmss.vic.edu.au

Contributions will be available to pay from Term 4 2025.

2.2 *Canvas Usage Guide* JOHN MONASH SCIENCE SCHOOL

Canvas

Canvas is the John Monash Science School's Learning Management System (LMS) that supports teachers in delivering a differentiated approach to learning – using traditional face-to-face practices with online technology. It is a cloud-based application which enables students and teachers to access the tools they need for learning and teaching wherever they are. It also enables parents to be enrolled as an observer thereby providing access to student results, assessment tasks and course materials

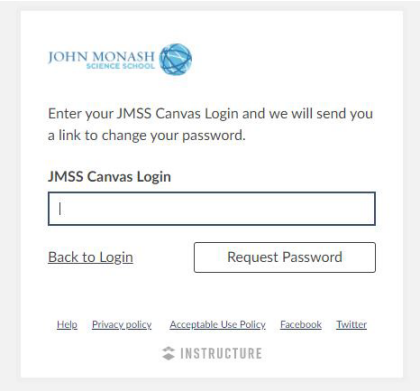
Logging into Canvas for the first time

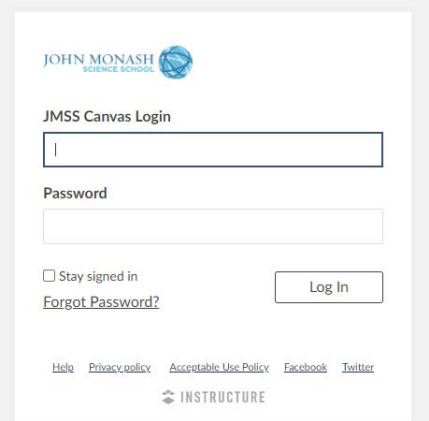
Canvas is accessible from any computer or mobile device with a standard browser. Canvas supports the latest versions of Chrome, Firefox, Internet Explorer and Safari. Just open your browser, log into Canvas, and you're ready to go.

It is strongly recommended that when you log into Canvas for the first time that you adjust the notification settings on your account and hence manage the frequency and type of notifications you receive - instructions for this can be found below.

First Time Canvas Login Instructions:

1. Go to https://jmss.instructure.com/login/canvas
2. Click on the "Forgot Password?" link.
3. Enter the email address as specified in this email under the JMSS Canvas Login field.
4. Click on the "Request Password" button and a reset link will be sent to your email address.
5. Access the reset link from your email and your new password will be available for you to use. Don't forget to check your junk or spam folder.
6. Return to the link in step 1 and bookmark for future convenience. You can also access the Canvas portal through the John Monash Science School Website.
7. Log in with your email address and the password you created.





On the login screen you can now enter your username and password sent to you from the John Monash Science School.

As a Canvas observer, you will have the following options:

- **View the Dashboard**
- **Set your Notifications**
- **View the course Syllabus**
- **View Marks for Assessment**
- **View but not submit Assignments**
- **View the Modules Page**
- **View the Calendar**

When you log into Canvas, you will see the Dashboard with all your child's subjects visible. *Click on any item to see more details.

Canvas Help

If you are experiencing trouble with your Canvas login, password or using the application; Please contact our eServices team at:

helpdesk@jmss.vic.edu.au **or** call 9905 1002

For assistance with Assignments, Assessment Dates, or other Canvas course content, please contact your child's teacher for the relevant subject.

2.3 *Absences, Late Arrivals,* EARLY DEPARTURES AND EXTENDED LEAVE

2.3A Absences

Students need to attend school regularly and punctually in order to maximise their academic performance and be able to take full part in all school-arranged activities.

Full school participation is important for students to develop core life and social skills, academic knowledge and values and attributes which prepare them for a life of learning and participation in their communities.

Students are expected to be at school each day by 8.20am and remain until the end of the school day at 3.20pm, with the exception of Wednesday's Co-Curricular Program which concludes at 3.30 pm.

Students are expected to be punctual to each class and Mentor Group Session.

If a student will be absent for the day, needs to leave early or will arrive late, please inform the school as soon as possible using any of the following options:

- enter details directly onto Compass using the Parent Portal; or
- send an email to: absences@jmss.vic.edu.au; or
- call the school on (03) 9905 1002 any time; or
- or email students' House Mentor

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Using Compass to advise of absences

Compass, our school's student management system can be used to advise of student absences, including arrival and late departures.

Compass can be accessed by visiting: http://jmss-vic.compass.education

If students have a Medical Certificate, as supporting documentation for their absence, it can be handed to or emailed to the Attendance Officer.

Students who are absent for an assessment or are absent for two or more days are required to present a Medical Certificate.

2.3B Late Arrival To School

Students who are late to school must sign-in at the Compass Kiosk.

They will need to present the printed Late Arrival ticket to the class teacher. Students without an acceptable reason for their lateness will be interviewed by their House Mentor.

Students may be required to make up lost time via one or more work management sessions as appropriate. Students who are late to class will be expected to catch up on the work missed and this will be monitored by the subject teacher of that class.

2.3C Early Departure From School

Parents are advised to make dental, medical and other appointments outside normal school hours.

Students who need to leave the school before the end of the day must have parent permission prior to leaving the school. Where possible early departure arrangements are to be made prior to the start of the school day.

Students must let the subject teacher know that they will be absent and make the necessary arrangements to obtain work missed during their absence and any homework that may be assigned.

If students need to leave during a class they are to inform the teacher before the lesson to minimise disruption for other students.

Once approval has been provided students must sign out using the Compass Kiosk before leaving the building.

2.3D Extended Leave

Families are expected to arrange their holidays to occur during the normal public and school holidays. However, under extenuating circumstances where extended leave from school is necessary, parents are to notify the House Mentor.

An **Application For Extended Leave Form** is available from an Assistant Principal and it is to be completed and submitted **two weeks prior** to the departure for the extended leave. Any student who is absent from school for an extended period and does not complete this process beforehand, will not have their absence approved, and will receive 'Not Satisfactory' for any assessment task missed during the period of absence.

Students who are ill for an extended period of time will be supported by their House Mentors and House Leaders, who will provide work which they can manage during their recovery and in preparation for their return to school. A Medical Certificate is required for extended absence due to illness.

2.4 ASSESSMENT

At JMSS a range of assessment methodologies are used by teachers to promote positive attitudes towards learning and encourage the pursuit of excellence.

Assessment at JMSS will:

- Include a variety of opportunities to encourage students to reach achievable goals;
- Create a cumulative record and reflect the dynamic nature of learning;
- Assist in the diagnosis of students' strengths and weaknesses;
- Report against relevant F-10 Victorian Curriculum learning areas and capabilities and VCE (Victorian Certificate of Education) outcomes.

Classroom teachers have the responsibility to:

- Ensure that students have a clear understanding of the subject goals and, in particular, of the nature, quality and quantity of work required, when work is due to be completed, and the criteria for assessment;
- Implement units of work and, in consultation with students, use a variety of strategies and techniques for gathering information on progress which caters for the range and qualities of student learning.

Students have the responsibility to:

- Provide the required work for assessment;
- Meet requirements of the units of work within the given timeline;
- Reflect upon their strengths and weaknesses in response to self and teacher assessment.

2.5 REPORTING

Reporting of student achievement will reflect the principles of assessment described above. Reporting to students and parents will clearly communicate the achievements of students and will provide recommendations to assist students' future learning.

Reporting at JMSS will include online reports at the end of each semester, available in the "Assessments" section of Compass, as well as interim reports midway through each semester. Progress interviews will be scheduled twice a year with students and parents, and available at other times as required.

CANVAS

All students will receive feedback about their progress in all subjects via the learning platform *CANVAS*.

Early in the school year each student and parent will receive a login to *CANVAS* that will allow both students and parents to see progress against learning tasks in each subject.

2.6 *Home* STUDY

Home Study/Homework is theoretical and practical work undertaken at home that relates to, consolidates, and supports work undertaken in school hours. This includes subject, test, and examination preparation, completion of set tasks, assignments, work requirements, revision, research and wider reading.

2.6A Philosophy

John Monash Science School views the setting and completion of Home Study as an integral part of the educational process. This school believes that this involvement reinforces and enriches the curriculum, encourages excellence, develops organisation and time management skills, and the capacity to assume responsibility for one's own learning.

Students are encouraged to realise that high aspirations and consistent effort in school and home study maximise the likelihood of success. Home study should be overseen and supported by both parents and teachers.

2.6B Development

For success at secondary level, balanced and consistent application is needed at school and at home. The nature and amount of home study at each year level will vary according to individual age, learning needs and contexts.

A committed and motivated student will invest time and effort in home study, and develop and practice constructive work habits and organisational skills necessary for success beyond the school setting. It is important that home study is balanced by hobby, social and sporting pursuits, in order to provide appropriately for individual interests, growth and relaxation.

2.6C Guidelines

As a general weekly guide, for students in Year 10 we suggest a minimum of 10 to 12 hours of Home Study per week. Varying school and individual circumstances often necessitate the use of weekends, holidays or non-teaching periods for Home Study.

It is the student's responsibility to ensure that work is subsequently completed after all absences from scheduled classes. This includes absences due to illness, instrumental music, appointments, sporting commitments, religious or other holidays. Students are responsible for recording Home Study details in their school diaries and completing set tasks.

2.7 *Book* LISTS

2.7A Textbooks and stationery

John Monash Science School's preferred textbook and stationery supplier for 2027 is Campion.

Campion website: campion.com.au

Campion offers a digital resource hub as well as physical copy delivery and 9 Victorian stores.

A list of prescribed and recommended textbooks and stationery will be released as soon as these details are available.

Some resources have special access options or are purchased directly from the publisher, please see the following resources for special access:

2.7B Digital resources

Edrolo -
Subjects requiring Edrolo will be indicated in the Booklist.

Students requiring this subscription will receive further details when booklists are released.

Education Perfect
Students studying LOTE - French or Japanese are required to subscribe to Education Perfect.

Students requiring this subscription will receive further details when booklists are released.

2.7C Secondhand Bookshop

Some secondhand textbooks are available from:

www.sustainableschoolshop.com.au/
Sustainable Bookshop flyer

2.7D Financial Assistance

Families experiencing financial hardship are encouraged to contact an Assistant Principal to discuss their circumstances and the support available.

2.8 INFORMATION *and* COMMUNICATION TECHNOLOGIES (ICT)

2.8A ICT at John Monash Science School

John Monash Science School integrates state-of-the-art technologies into the curriculum. Our aim is to ensure that every student is able to engage with interactive learning materials and that they are able to create their own authentic responses through the live capture and editing of images, sound, video and the written word. Furthermore, we challenge our students to create high-quality responses that they will want to share with the world. We believe this endeavour helps us to identify the best blend of technologies for their studies.

Due to the limited number of powerpoints and other charging facilities on campus, both the main and secondary devices are expected the be fully charged at the start of each school day.

In support, the school's wireless network allows students high-speed access to a range of electronic resources within the School, the University and the Internet. A blend of portals (including Compass , CANVAS and Google Apps) provides students with lesson resources to be downloaded, access to emails, shared school calendars and tools that provide teachers with feedback on their learning.

2.8B JMSS BYOD Program

BYOD website link : https://jmss.vic.edu.au/byod

The school's decision to adopt a Bring Your Own Devices (BYODs) model is made with the future in mind. The openness of this approach best serves the needs of parents and students, as students may bring a device or devices they already own. Wireless internet access is available throughout the JMSS building and on the Monash University campus.

It is expected that students at John Monash Science School need one device (for example a laptop or notebook computer) to serve as the student's primary computer.

2.8C Mobile Phones

As per Department of Education policy, students must lock phones in their lockers at the start of the day and can only use them within the school with teachers permission.

2.8D Smart Glasses

Smart glasses or glasses/spectacles with a built in camera are not allowed at JMSS.

Digital Devices Website

To help support and inform parents and students, the school maintains a dedicated Digital Devices website:

The Digital Devices website can be found by visiting
https://sites.google.com/jmss.vic.edu.au/byodprograminformation/home

and contains information on:

- points to consider;
- minimum specifications;
- options and scenarios;
- security and protection;
- purchasing;
- electronic resources (prescribed Apps and eBooks);
- key dates;
- frequently asked questions.

Please visit the website to orientate yourself with your hardware needs prior to starting at John Monash Science School.

2.9 *Work Experience* PROGRAM

All Year 10 students are required to participate in the JMSS Work Experience Program in *Term 2, 2027 (21st June - 25th June).*

The aim of the program is to broaden the students' understanding of the workplace and widen their perspective of career opportunities. At JMSS students are expected to seek work experience in industries or organisations they have an interest in. Students are expected to participate fully in this program as it will enable them to experience the reality of the workplace, and gain an understanding of the work environment and employer expectations. It also gives students a chance to see if they would like to pursue a particular career by working in an industry.

It is important to apply as early as possible for placements, particularly if you would like to do your work experience at a hospital/zoo/police academy or other popular organisations. Previously students have completed their placement in a variety of workplaces including CSIRO, Melbourne Aquarium, The Hudson Institute of Medical Research, Southern Health, Peter MacCallum Hospital and various departments within Monash University including Chemistry, Physics and Biomedical Science.

It is important to note that some placements close applications towards the end of 2026 for 2027 placements, so students wishing to have the broadest range of possible placements available will need to prepare applications as early as possible.

The school will have a dedicated Work Experience Week where we suggest most work experience placements take place. Placements can take place outside of the Work Experience Week but they are best planned for during that week or during holiday periods.

Students will receive a Work Experience Handbook at Orientation Day which contains the Work Experience Arrangement Forms required for placements.

Work Experience/Career Enquiries

Any queries about work experience can be directed to:

Ms Kirstine Carter
kirstine.carter@jmss.vic.edu.au

and all students seeking further information are encouraged to visit our Careers and Pathways website:

http://jmsscareers.com

2.10 *Morrisby Profile* TRANSFER PROCESS

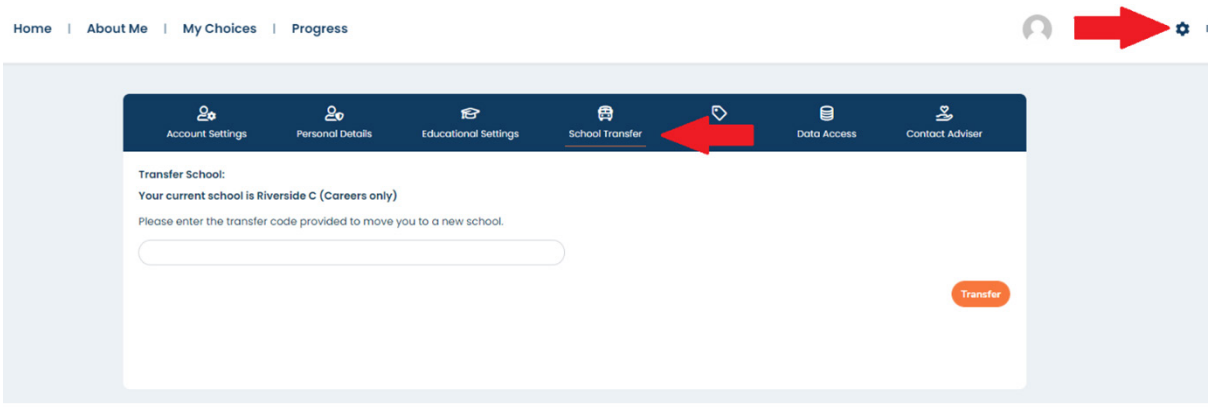
For students who have already had the opportunity to complete a Morrisby Profile aptitude test (usually in Year 9 at government schools), it can be very useful to transfer your account to retain access to your test results and to set your current school as John Monash Science School.

This will allow you to access your Morrisby reports if you would like to refer to them at any stage.

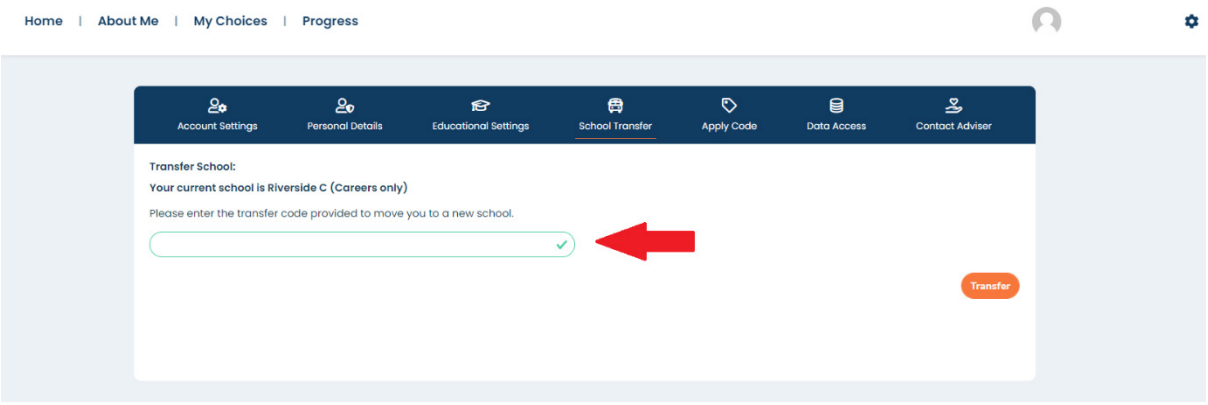
Please follow these steps set up by Morrisby:

Morrisby requires students to transfer their account themselves.

- Log into your Morrisby account
- Click on the Settings cog at the top right of the screen
- Select 'School Transfer'



- Enter the transfer code provided then select Transfer. The transfer code for John Monash Science School is **t6L52A**



- Click 'Confirm' if the organisation displayed is correct.



JOHN MONASH
SCIENCE SCHOOL

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Section Three:

STUDENT EMPOWERMENT AND WELLBEING



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3.1 - 3.5

Section Three:
STUDENT EMPOWERMENT AND WELLBEING

3.1 *Student* EMPOWERMENT

The aim of John Monash Science School is to fully develop the talents and capacities of all students to help them strive for personal best.

We help our students to develop interdisciplinary capabilities such as critical and creative thinking, alongside ethical, inter-cultural, personal and social perspectives. Students are empowered through learning in the classroom, extra-curricular and co-curricular activities, and leadership opportunities, to develop the above capabilities so that they are equipped for their future in a changing world.

The JMSS Strategic Plan has a whole school approach to student engagement, empowerment and wellbeing. We believe in providing students with an environment that promotes responsibility, resilience and a growth mindset.

Positive Education was introduced at the start of 2018 as a whole-school approach to promoting a positive climate for learning.

Positive Education focuses on specific skills that assist students to strengthen their relationships, build positive emotions, enhance personal resilience and promote their health so that students are positively engaged in their learning and experience positive accomplishments.

3.1A Strategies to promote Student Empowerment, Engagement and Wellbeing

The following structures / processes / strategies are put in place to promote Student Empowerment, Engagement and Wellbeing at John Monash Science School.

Partnership with Monash University:

- We create and sustain links to academic partners within Monash University, as well as external organisations, who can enrich the learning experiences and opportunities of our students, such as in their Work Experience Program.

Technology-rich Learning Environment:

- We develop an innovative ICT-rich learning environment in order to improve student engagement and achievement.

Student Voice & Agency:

- We encourage Student Voice at JMSS to be a powerful and positive influence on student learning, personal development and the building of leadership capacity;

Student Leadership:

- We empower our students to take an active leadership role in organising club activities and make decisions that impacts on school programs and activities. Our Student Parliament is a powerful structure which enables student leadership.

House System:

- We develop a strong and vibrant House and Mentor System, with a view to building and sustaining connectedness within the student body, and between students and staff.

Induction Program:

- We are dedicated in assisting our new students to have a smooth transition to JMSS. All Year 10 students commence the school year with the Orientation Camp.

Co-Curricular Program:

- We have a well established Co-Curricular program that enables students to develop skills beyond classroom learning.

Counselling support:

- We ensure effective counselling and monitoring processes are in place so that every JMSS student progresses through a course which suits their abilities and aspirations, and leads to a pathway of their choosing beyond JMSS. The students' Mentors undertake an active role in the monitoring of the student learning journey and pathway.

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Access to Student Counsellors

Our students have access to a dedicated team of student counsellors, providing support, advice and assistance whenever needed.

Student counsellors can be found on the first floor of the school, between the Doherty and Flannery House areas.

3.2 *House* STRUCTURE

When commencing study at John Monash Science School, all students are allocated to both a House and a House Mentor Group.

There are four Houses at John Monash Science School, each named after famous Australian scientists:

Elizabeth Blackburn; Peter Doherty, Tim Flannery and Fiona Wood

Each House has one House Leader and one Assistant House Leader who monitor the progress of all students in the House.

Each House Mentor Group has a Mentor (teacher) who is responsible for looking after the personal wellbeing, academic progress and development of their students.

The Mentors monitor the progress of their students and assist students in developing their Learning Plans. The student's Learning Plan is owned and used by the learner and supported by the Mentor. The Mentor is an advocate for their students, and oversees the learning targets, progress and achievements of the students in their Mentor Group.

Each House also has a Student Leadership Team of House Captains and Student Parliament members. The Student Parliament provides a powerful 'Student Voice' which helps shape the students' learning experiences at JMSS.

Regular House activities enhance connectedness with peers and teachers. Throughout the year, friendly competition exists between the students in their Houses as they vie for the House Sporting Shield and House Aggregate Shield Awards, which recognise student participation and achievement. House activities embrace a diverse range of events such as House Trivia, Swimming and Athletics Carnivals.

3.3 *Personal* DEVELOPMENT PROGRAM

All students in Year 10 have access to a range of opportunities to enhance their own academic, social and emotional development.

This includes development of:

- Course and Careers Pathways with the Careers Coordinators and House Leaders.

and participation in:

- Student leadership programs such as in Student Parliament and Interact Club; and,
- Co-curricular Program which provide choices in more than 25 electives), Sports, Performing Arts, Computing and Community Service and leadership development.
- Work Experience opportunities in a science-related industry or organisation,
- Extracurricular activities, such as debating competitions, International Student Science Fairs and Supercomputing conventions.

3.4 *Subject and* CAREERS PLANNING

Formalised pathways planning is a Department of Education and Training (DET) imperative. It aims to provide students with a structured approach to obtaining accurate and relevant careers and pathways advice.

The goals of this program are to:

- Improve employment outcomes and other education outcomes for young people;
- Provide greater selection of curriculum and support programs for young people;
- Improve tracking of young people and monitoring of standards and outcomes for young people against local and statewide benchmarks.

Careers and Pathways Planning program is important in assisting senior students to obtain valid and up-to-date pathways advice so that they can develop a detailed career plan.

Students will be given the opportunity to discuss their career aspirations with the JMSS Career Coordinators, Mentors and other JMSS staff over the course of the year. They will then develop their own career plan using information obtained from Learn To classes, vocational testing and individual career counselling. There are multiple opportunities for parents and students to discuss their career plan with trained careers and pathways counsellors.

Choosing a career path is an important decision by Year 10 students, who have already sampled many subjects, developed some skills and have a variety of interests. A good starting point for choosing a career path that suits their abilities is to choose subjects they are interested in and enjoy doing.

3.5 *Induction* PROGRAM

All students in Year 10 will attend a 2-day Induction Program (non-residential), beginning on **Thursday, 28 January 2027** and running **Friday, 29 January 2027.**

The orientation is held during the day, within the campus of Monash University.

3.5A Activities

Programs at the camp include activities that promote:

- Building the JMSS Team - providing students and teachers with a key opportunity to get to know one another, and learn to work in teams;
- Learning at JMSS - providing an opportunity to introduce learning expectations and develop learning skills;
- Orientation in Monash University - providing an opportunity for our students to become familiar with the libraries, sports, music and science facilities.

Each day's activities are thoroughly planned and will be fully explained to the students at the start of the camp. Students will be given a number of responsibilities, including participation in various duty groups. The Department of Education Guidelines on safety and correct supervision are followed at all times.

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Compulsory Attendance

Parents and caregivers are asked to please note:

Attendance at Orientation Program is compulsory for all new Year 10 students at John Monash Science School.

3.5B What to wear/ bring

Students are advised to wear/bring the following items:

- Casual / comfortable clothes
- Sunscreen, hat/cap;
- Pens / writing pad;
- Lunch and water bottle

3.5C Talent Show

As part of the Orientation Program, there will be a student talent show. All students are encouraged to participate by presenting a prepared item. Students may prepare and present items as individuals or in groups.

Talent Show items could include (but are not limited to):

- performance of songs;
- playing of a musical instrument (there is a piano at the Farrer Hall Theatre or bring your own musical instrument);
- dance;
- poetry reading/recital;
- drama skits; or,
- demonstrations of a special skill or talent, for example whip cracking, sketching or a martial art.

3.5D Orientation Program Contact

Any enquiries about Orientation Camp can be directed to:

Mr. Malcolm Anderson
Head of Student Transition
malcolm.anderson@jmss.vic.edu.au

JOHN MONASH
SCIENCE SCHOOL

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Section Four: FINANCIAL INFORMATION



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Section Four:
FINANCIAL INFORMATION

4.1 *Payment* ARRANGEMENTS

Please Note: At the time of publishing, the financial contributions tables were not all finalised for 2027 and these will be provided to you as soon as availble, these will be issued separately.

We have included the music table below for extra curricular as this is available.

4.2 *Financial* CONTRIBUTIONS

Extra- Curricular Items and Activities PROVIDED ON A USER-PAYS BASIS

2027 – Voice & Instrumental Music (if applicable)	
• Individual ½ hour	**$999.00**
• Individual ¾ hour	**$1,499.00**
• Individual 1 hour	**$1,999.00**
• Ensemble only	**$95.00**

Financial Support FOR FAMILIES

John Monash Science School understands that some families may experience financial difficulty and offers a range of support options, including:

- The Camps, Sports, and Excursions Fund (CSEF)
- State Schools Relief Support for uniform
- Payment plans for Extra-Curricular Activities
- Support from the Schools Student Opportunity Fund

For a confidential discussion about accessing these services, or if you would like to discuss alternative payment arrangements, contact:
The Business Manager (Mr Corey Goodes)
Ph: 03 9905 1002 | Email: *john.monash.ss@education.vic.gov.au*

Payment Methods

All payments are made through Compass. If you have any questions, please contact the General Office on 9905 1002 - Office hours are 8.30am to 4.00pm Monday to Friday.

Refunds

Parent requests for refunds are subject to the discretion of the school and made on a case-by-case basis. Refunds will be provided where the school deems it is reasonable and fair to do so, taking into consideration whether a cost has been incurred, the Department's Parent Payments Policy and Guidance, Financial Help for Families Policy, and any other relevant information.



PARENT PAYMENTS POLICY

ONE PAGE OVERVIEW

FREE INSTRUCTION

- Schools provide students with free instruction and ensure students have free access to all items, activities and services that are used by the school to fulfil the standard curriculum requirements in Victorian Curriculum F-10, VCE and VCAL.
- Schools may invite parents to make a financial contribution to support the school.

PARENT PAYMENT REQUESTS

Schools can request contributions from parents under three categories:

Curriculum Contributions	Other Contributions	Extra-Curricular Items and Activities
Voluntary financial contributions for curriculum items and activities which the school deems necessary for students to learn the Curriculum.	Voluntary financial contributions for non-curriculum items and activities that relate to the school's functions and objectives.	Items and activities that enhance or broaden the schooling experience of students and are above and beyond what the school provides for free to deliver the Curriculum. These are provided on a user-pays basis.

- Schools may also invite parents to supply or purchase educational items to use and own (e.g. textbooks, stationery, digital devices).

FINANCIAL HELP FOR FAMILIES

- Schools put in place financial hardship arrangements to support families who cannot pay for items or activities so that their child doesn't miss out.
- Schools have a nominated parent payment contact person(s) that parents can have a confidential discussion with regarding financial hardship arrangements.

SCHOOL PROCESSES

- Schools must obtain school council approval for their parent payment arrangements and publish all requests and communications for each year level on their school website for transparency.

Tax Deductible
BUILDING FUND

By contributing to the Tax Deductible Building Fund, you can make a significant investment in your child's education and improving the general facilities at John Monash Science School.

Since the establishment of the Building Fund in 2010, we have used parent contributions to develop a range of facilities in the school. This includes a covered amphitheatre, a new landscaped area north of the basketball court and increased outdoor recreation facilities for students. These facilities are now highly used by students and have only been made possible because of the support and generosity of parents.

In recent years, we have undertaken major projects including resurfacing the basketball court, replacing the basketball and netball rings, and building new as well as refurbishing existing wellbeing spaces for students.

Tax Deductible
LIBRARY FUND

Every student at John Monash Science School should develop a love of reading. By contributing to the Tax Deductible Library Fund, you can make a significant investment in your child's education and John Monash Science School's Library.

Since the establishment of the Library Fund in 2010, we have used parent contributions to purchase an RFID Self-Loan Station and Electronic Security System. This state-of-the-art system is a success and allows our students to self-loan hardcopy resources from our collections for personal enjoyment and academic research.

Recent updates to the library have also been possible due to the support of this fund.

We work to continually maintain and update the library space and collections to encourage use and enjoyment for our students.

Our digital provisioning has also been supported by this fund, students are able to access many online subscriptions, databases and eResources to support their learning and to provide them with the most up-to-date and engaging content.

4.3 *Payment* METHODS

Available Payment Methods	
Compass	Full payment or payment arrangement. Please use your parent login to make payment via Compass Payment Centre.
Credit Card	Mastercard or Visa Credit Card payments can be made either in person, over the phone on 9905 1002, Please include your email address (if applicable) on all correspondence to enable us to contact you if required
EFTPOS	Eftpos facilities are available at the General Office for personal payments. Please bring all paperwork with you when making payments.
Cash	Payments can be made by cash by visiting John Monash Science School Office between the hours of 8.30am and 4.00 pm Monday to Friday. Please do not send cash by mail.
Individual Payment Plans	Individual payment plans can be arranged by contacting the Business Manager on 9905 1002.

4.4 *Parent Payments* POLICY

Link for parents to access the payments policy: - *https://www2.education.vic.gov.au/pal/parent-payment/policy*

4.5 *Student* INSURANCE

The Department does not provide personal accident insurance or ambulance cover for students.

Parents/carers of students, who do not have student accident insurance/ambulance cover, are responsible for paying the cost of medical treatment for injured students, including the cost of ambulance attendance or transport as well as any other transport costs.

4.6 CAMPS, SPORTS *and* EXCURSIONS FUND (CSEF)

The Victorian Government offers an initiative to ensure all Victorian students can take part in school trips and sporting activities.

Families holding a valid means-tested concession card or temporary foster parents are eligible to apply for $400 per year paid for eligible secondary school students. Payments will go directly to the school and be tied to the student.

Applications to the CSEF are available from the General Office or search 'CSEF Form' in your search engine to download the form directly. Please return the completed form to the General Office along with a copy of your Health Care Card.

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Section Five:

SCHOOL COMMUNITY AND OUTREACH PROGRAMS



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5.1 - 5.3

Section Five:
SCHOOL COMMUNITY AND OUTREACH PROGRAMS

5.1 *School* COUNCIL

JMSS has a vibrant community including parents, academics, industry leaders and past JMSS students. We draw on the experience, expertise and energy of members of our parent community to continue to guide JMSS through the formative years of its development. There are many ways to participate and contribute.

School Council contributes to the important business of governance of JMSS. Elections for School Council take place in March in each calendar year, and we also welcome new parents to join our subcommittees:

- Programs and Policies;
- Facilities; and,
- Finance.

If you are interested in any of these subcommittees please contact our Business Manager Mr Corey Goodes at school or email:
john.monash.ss@education.vic.gov.au

5.2 VCES & ESV

JMSS continues to engage with the Victorian community by providing opportunities for students who are capable and interested in science to pursue their interests further.

In 2026 JMSS ran virtual classes in a range of science electives via Emerging Sciences Victoria and we have been successful in gaining funding to challenge high ability students through Victorian Challenges and Enrichment Science.

JOHN MONASH
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Section Six:

CURRICULUM AND SUBJECT SELECTION



Cs
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Section Six:
CURRICULUM AND SUBJECT SELECTION

6.1

Course Selection:
STEPS AND IMPORTANT DATES

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Information Night

JMSS Year 10 Information Night is on
Thursday the 15th October 2026

Steps for Course Selection

1

Read about and discuss the Course Selection Process and the VCE

Read this section of the handbook carefully and find out specifically what subjects are being offered and what each unit entails.

Descriptions of each subject are provided in ***Section Seven: Index of Available Subjects***

This handbook contains some pathway information and blank proformas that can be used to assist making subject choices.

2

Fill out the web preferences online by Thursday, 22 October 2026.

You have an individual login and password. You will find instructions for filling in web preferences in ***your Forms and Documents*** (Which will be sent via mail)

3

Maths Methods Assessment

For those students wanting to complete accelerated Maths in Year 10 there is ***compulsory assessment*** to assess student readiness for acceleration on ***22 October, 2026.***

This assessment will be held at JMSS, and registration will be via email from the Head of Mathematics, Mr Rowen May.

You wil need a pen and pencil with which to write. Calculators are not required. The results in this assessment determine the group of students that will be allowed to do accelerated Maths in Year 10.

You will be emailed your results 2 weeks after the test.

4

Fill in the forms for Parent Payments, Transition and Orientation Camp, and bring them to Course Confirmation Interviews.

These forms will be sent physically via mail.

All students will be interviewed with their parents about their proposed course pathway and have their subjects for 2027 confirmed.

Parents will be emailed about the exact date and time of these interviews.

At this interview parents will also receive the booklist, there will be an opportunity to make subject payments, and Music and Orientation Camp fees are due at this time.

5

Orientation Day

All new students are expected to be at JMSS on for Orientation Day on Friday, 4th December.

On this day students will meet their mentors, be given a buddy, and get to know some of the other new students.

Details about this day will be given at the course confirmation interview on 12th & 13th of November.

6.2 *Curriculum* STRUCTURE

The curriculum program at John Monash Science School is based on a 2-week timetable. Each fortnight students complete 48 lessons and up to 4 hours of co-curricular activities.

Monday, Tuesday, Thursday and Friday are 5 lesson days. On Wednesday students have a four lesson day with co-curricular program after lunch.

In Year 10 all students will study subjects from each of the following curriculum areas: English, Mathematics, Core Science, Enrichment STEM, Issues Studies, Data Science, Physical Education, LOTE, Co-Curricular Activities and Personal Learning.

Choices within these areas are shown in *Table 6.2-T1 Subject Selection: Curriculum Structure*.

Descriptions of each curriculum area are found in *Section Seven* of this handbook.

Year One

Semester One (S1)		Semester Two (S2)
6.1	English	English
6.3A	Core Mathematics	Core Mathematics
6.4	Core Science	Core Science
6.2	Issues Studies	Issues Studies

Subject Choices

Physical Education *or* LOTE			
Data Science		Enrichment STEM Elective	
Enrichment STEM Elective		Enrichment STEM Elective	

Co-Curricular

Co-Curricular Elective		Co-Curricular Elective	

6.3 *STEM* ELECTIVE RULES

Students select 4 Enrichment STEM elective subjects across the year. They are strongly encouraged to choose one enrichment science from each of the enabling sciences or mathematics, and should consider selecting a science that they may not have considered before to broaden their experience and help advise their VCE choices.

One of these subjects must be either:

7.5A *Data Science: Introduction to Games Programming* ***or***

7.5B *Introduction to Programming, Machine Learning* and Simulations

Some subjects such as *Aquatic Fieldwork Science* have limited capacities due to the nature of the subject.

VCE Physics only runs in second semester.

Physics 2 is for students with a strong foundation in the subject. Applications for these subjects will be sought after the start of the 2026 school year.

When selecting STEM electives, students must select one elective from category 1, and category 2 and data science 1 or 2. You will also need to list reserve subjects.

i

Table of Enrichment STEM Electives

To help ensure you have chosen an allowable and coherent combinations of electives, use the Enrichment STEM Elective Rules in combination with the *Table of Enrichment STEM Electives (6.3–T1)*.

6.2 T1 *Subject Selection* CURRICULUM STRUCTURE

Table of Curriculum Offerings

Mathematics	*Choose One*	
	Core Mathematics	
	VCE Mathematical Methods 1 + 2	

English	*Choose One*	
	English	
	English as an Alternative Language (EAL)	

PE/LOTE	*Choose One*	
	Physical Education	
	French	
	Japanese	

Data Science	*Semester Subjects*	
7.5A	Introduction to Games Programming and Data Science	
7.5B	Introduction to programming, Machine Learning and Simulations	

Enrichment STEM Electives

Category 1	*Semester Subjects*	
7.7A	Analytical Spectroscopy	
7.7B	Aquatic Fieldwork Science	
7.7C	Astrophysics	
7.7D	Biotechnology	
7.7E	Materials Science & Engineering	
7.7F	Tiny Village Design	
7.7G	Medical Physics	
7.7H	Microbiology	
7.7I	Nature & Beauty of Mathematics	
7.7J	Disease, Disorders & Scientific Discovery	
7.7K	Pharmaceutical Science	
7.7L	Terraforming Mars	
7.7N	Decoding Light	

Category 2	*Semester Subjects*	

Do you intend to apply at the end of Term1 for entry into Advanced Chemistry or VCE Physics. (Select 1 only)

Advanced Physics	

- **Please note. The number of each elective class that runs will depend on the number of enrolments and staffing**

Cc	Co-Curricular Program				
		–	Little Scientist		
		–	Little Mathematicians		
		–	Specialist Studies in many areas		

6.3 T1 *Subject Selection* STEM ELECTIVE SUBJECTS

Table of Enrichment STEM Electives

	Subject		Notes	Quota	BIO	CHM	ENV	ENG	GEO	ICT	MTH	PHY
Ds	7.5A	Introduction to Games Programming and Data Science	–							•		
	7.5B	Programming for Simulations and Machine Learning								•		
C_1	7.7J	Disease, Disorders & Scientific Discovery			•							
	7.7B	Aquatic Fieldwork Science			•		•					
	7.7D	Biotechnology			•							
	7.7K	Pharmaceutical Science			•	•						
	7.7A	Analytical Spectroscopy				•						
	7.7H	Microbiology			•							
	7.7L	Terraforming Mars			•		•		•			•
	7.7E	Materials Science and Engineering				•		•				•
	7.7F	Tiny Village Design				•				•		•
	7.7I	Nature and Beauty of Mathematics									•	
	7.7G	Medical Physics			•							•
	7.7C	Astrophysics										•
	7.7N	Decoding Light				•						•
C_2	**Application for these subjects occurs in Term 1, 2026** (You cannot do both)											
	7.7M	VCE Physics	S2 Only									•

Ds

Data Science
Students must choose one Data Science subject to complete at Year 10 level.

C_1

STEM Electives – Choose five and you will be allocated three out of the five

C_2

STEM Acceleration

Accelerated pathway in Physics is via application at the end of Term 1, 2027.

- • Branch of STEM addressed in elective

BIO	Biology	**GEO**	Geoscience
CHM	Chemistry	**ICT**	Information Technology
ENV	Environmental Science	**MTH**	Mathematics
ENG	Engineering	**PHY**	Physics

6.5 T1 *Subject Selection* VCE OFFERINGS

Table of VCE Offerings (offerings are subject to change)

Mathematics / Science					Art / Humanities / LOTE / Computing				
Algorithmics			3	4	Computing	1	2		
Biology	1	2	3	4	Economics	1	2	3	4
Chemistry	1	2	3	4	Extended Investigation			3	4
Maths and Computational Physics	1	2			French	1	2	3	4
Environmental Science	1	2	3	4	Geography	1	2	3	4
Mathematical Methods	1	2	3	4	Politics	1	2	3	4
Physics	1	2	3	4	History: 20th Century	1	2		
Psychology	1	2	3	4	History: Revolutions			3	4
Specialist Mathematics	1	2	3	4	Japanese	1	2	3	4
University Extension Subjects			3	4	Literature	1	2	3	4
					Music Performance	1	2	3	4
					Physical Education	1	2	3	4

6.4 *Rules for* ACCELERATION

Rules for Acceleration

Rules for entry for accelerated pathways into Year 12 Science subjects in Year 11, only 1 acceleration

Subject	Pre-Requisites	Recommended
Year 12 Biology	–	Successful completion of one semester of Biotechnology, Microbiology or Diseases, Disorders and Scientific Discovery.
Year 12 Physics	Successful completion VCE Physics in Semester Two, excellent work habits across all subjects, and Core Science teacher recommendation.	
Year 12 Chemistry	Not available as an acceleration option	
Year 12 Mathematical Methods	Successful completion VCE Mathematical Methods Units 1&2 in year 10, excellent work habits, and VCE Methods teacher recommendations.	

6.5 VCE OFFERINGS

Curriculum can lead to a variety of VCE (Victorian Certificate of Education) subjects shown in *6.4–T1 Table of VCE Offerings*. Units 1 to 4 are offered in all subjects unless otherwise depicted.

If a student wishes to pursue a subject that is not listed they may be able to study that subject by correspondence after consultation with the VCE team.

Please note that some subjects in the Arts/Humanities list may need to be offered by correspondence. Final decisions will depend on student demand.

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University Extension Subjects

This structure in Years 1 and 2 at John Monash Science School will allow many students to select university extension studies in Year 3.

6.6 AUSTRALIAN TERTIARY ADMISSIONS RANK (ATAR)

At the completion of Year 12 (Year 3 at JMSS) each student will receive an Australian Tertiary Admission Rank (ATAR). This rank is calculated by the Victorian Tertiary Admissions Centre (VTAC) after receiving subject results from the Victorian Curriculum and Assessment Authority (VCAA).

Each student will be notified of their ATAR by VTAC at the same time as the applicant receives his/her study scores from VCAA.

A student's ATAR is the percentile ranking of that student. It gives the comparative placement of that applicant to all other people of school leaving age on the basis of their Year 12 results. The ATAR plus other selection requirements are used by Tertiary Institutions to select students for course entry.

7.5A Process of determining ATAR

This is a two-stage process:

- First, the normalised study scores for each VCE study are adjusted to reflect differences in the cohort of students taking that study compared to other studies and differences in the difficulty of the VCE studies ("scaling")
- Second, the ATAR will be determined by an algorithm to produce an overall percentile ranking of the applicant.

The algorithm will take into account:

- A student's study score in English (or English as an Alternative Language EAL); and
- the student's best three global scores; and
- 10% of the student's next two best study scores.

Up to six study scores may be used and all study scores are adjusted by the comparison process.

7.5B Combinations of Studies

All accredited VCE studies, for which study scores have been issued, may be used except that only ONE of each of the following combinations can be used in the 'primary four' (the other may be used as an increment):

- Drama / Theatre Studies;
- Dance / Dance Styles;
- Art / Studio Arts.

No more than two Mathematics studies (ie. drawn from either previous or current VCE Mathematics) and no more than two LOTEs can be included in the 'primary four'. (Other Mathematics and/or LOTEs can be used as a 10% increment.) 'Primary four' refers to studies that will be used first when creating an ATAR. These are English plus the next three highest scoring studies.

6.7 JMSS DIPLOMA

The JMSS Diploma acknowledges and rewards the development of important skills and attributes as outlined in the school's Learner Developmental Framework. The Diploma provides recognition for the achievements of our students outside of the classroom including leadership, service, sport, performing arts and competitions.

The school believes that these skills and attributes are important in the education and growth of the highly capable leaders and pioneers in science which JMSS produces. The Diploma champions the development of the whole person, not only their academic achievement and will complement the Victorian Certificate of Education (VCE).

Students will receive the JMSS Diploma at the end of their three years at JMSS along with their VCE certificate.

The JMSS Diploma is a three-year journey designed to inspire, nurture and challenge students to become the best they can be. Starting at Year 10, the JMSS Diploma aims to encourage and inspire students to:

- Lead balanced, enriched and passionate lives;
- Develop as well-rounded individuals with a broad range of skills, perspectives and interests;
- Fully develop their interests, strengths and capacities;
- Gain recognition for student-driven initiatives, talents, strengths and service;
- Foster broad academic interests.

- The JMSS Diploma is organised under the UNESCO's Four Pillars of Learning; with the Learning to Know Pillar providing the foundation of student achievement in the other three Pillars. The JMSS Programme is designed to offer a wide array of opportunities for students to achieve in all four Pillars.
- At the annual Presentation Night students at each year level are recognised for their outstanding achievements in each of the four Pillars.

Activities for which students will be awarded credits include the following:

The JMSS Diploma Model

Learning to Live Together	Learning to Do	Learning to Be	Learning to Know
All Community Service Development including community service and volunteering, representing JMSS in Music, Sport, Science and Committees and students who have shown a significant sense of community	Skill Development	Character Development including all formal leadership, all leadership of activities and students who have demonstrated significant personal growth.	Involvement in academic programs that extend knowledge beyond the classroom. Involvement in academic competitions.

6.7 *JMSS Diploma levels* **OF AWARD**

- The JMSS Diploma is awarded on a tiered basis that include the JMSS Diploma (Platinum), the JMSS Diploma (Gold), JMSS Diploma (Silver) and the JMSS Diploma (Bronze)
- The JMSS Diploma is a combined credit and criterion certification based on a tiered system:

  - Upon meeting the minimum criteria and accumulating minimum credits in each of the three pillars in the JMSS Programme students are awarded the JMSS Diploma (included in their Graduation package on Presentation Night).

  - Upon meeting higher levels in the criteria and accumulating higher credits across one or more of the three pillars in the JMSS Programme students are awarded the JMSS Diploma in one of the 4 tiers.

  - The eligibility requirement for the JMSS Diploma (Platinum), endorsement from the student's Mentor and recommendation by a select committee (including House Leaders and Principal Class members).

JMSS Diploma Levels of Award

Levels of Awards	JMSS Diploma (Bronze)	JMSS Diploma (Silver)	JMSS Diploma (Gold)	JMSS Diploma (Platinum)
Eligibility Criteria	Awarded upon meeting the minimum criteria across all the four pillars.	Awarded on meeting the silver criteria by obtaining points in the threshold as determined by the Diploma Committee.	Awarded on meeting the Gold criteria by obtaining points in the threshold as determined by the Diploma Committee and: -Endorsement from House Leader	Awarded on meeting the Platinum criteria by obtaining points above a threshold as determined by the Diploma committee and: -Endorsement from House Leader - Recommendation by Diploma committee
	Minimum completion and participation requirements met in the JMSS Diploma Programme	Higher levels of achievement and participation in the JMSS Diploma Programme.	Higher levels of achievement and participation in the JMSS Diploma Programme.	Higher levels of achievement and participation in the JMSS Diploma Programme.

JOHN MONASH
SCIENCE SCHOOL

I
7.1 - 7.11

Section Seven:

INDEX OF AVAILABLE SUBJECTS

R

REQUIRED SUBJECTS



7.1 ENGLISH

Overview

The English program at John Monash Science School will deliver challenging, dynamic and engaging learning experiences designed to equip students with the essential skills of communication and critical thinking.

R

Requirement

All students will complete English or English as an Alternative Language (EAL) at Year 10 level.

7.1A Curriculum Focus

In Year 10 English, students will cover the areas of Reading, Writing, Speaking and Listening with a particular focus on developing an understanding of the world through a range of texts. Students are encouraged to engage in meaningful discussions about a broad range of textual ideas and express these ideas effectively in a variety of forms.

7.1B Learning Outcomes

At the completion of these modules students are expected to be able to:

- Explore their ideas and insights into textual themes and issues;
- Develop written pieces in a range of different forms for a variety of audiences and purposes;
- Identify ways in which language is used to engage the reader; and,
- Improve verbal communication skills for a variety of different audiences.

7.1C Assessment

At the completion of these modules students are expected to be able to:

- Explore their ideas and insights into textual themes and issues;
- Develop written pieces in a range of different forms for a variety of audiences and purposes;
- Identify ways in which language is used to engage the reader;
- Improve verbal communication skills for a variety of different audiences.

English as an Alternative Language (EAL) Status

Students will be considered for English as an Alternative Language status if both of the following conditions are satisfied:

- The student has been a resident for not more than seven years (in total);
- English has not been the student's major language of instruction for more than seven (7) years prior to Units 3 and 4.

It should be noted that these qualifications apply to VCE studies only.

Throughout Year 10, students will be given in class language support by their Year 10 English teachers, including the VCE EAL teacher.

If this situation applies to you please discuss this with our Head of English:

Ms Louise Bourke
louise.bourke@jmss.vic.edu.au

7.2 ISSUES STUDIES

Overview

Issues Studies is a subject that is primarily a collection of integrated units that teach the skills, approaches and perspectives of the Humanities with links to many of the science disciplines. Perspectives addressed in this subject include social, historical, geographical, environmental, political, economic and ethical.

Requirement

R

All students will complete Issues Studies at Year 10 level.

7.2A Curriculum Focus

This subject is designed to get students to think, formulate ideas and investigate a range of issues of significance to Australians today. These issues may be global in orientation and can include examples such as climate change, sustainability, land degradation, water use, bioethics, terrorism, refugees, food resources, poverty and population issues.

Students will be exposed to a range of technologies and resources such as GIS (Geographic Information Systems), ABS data, web-based references, computer modelling/ simulations and selected readings to assist in providing a framework to analyse selected issues. Fieldwork is a compulsory aspect of this study. Each semester students will also be given the opportunity to complete a supervised project on an issue of their choice.

7.2B Learning Outcomes

By the end of Year 10, students predict changes in the characteristics of places over time and identify implications of change for the future. They identify, analyse, and explain significant spatial distributions and patterns and significant interconnections within and between places, and identify and evaluate their implications, over time and at different scales.

They evaluate alternative views on a geographical challenge and alternative strategies to address this challenge, using environmental, social and economic criteria, explaining the predicted outcomes and further consequences and drawing a reasoned conclusion.

They ethically collect relevant geographical data and information from reliable and useful sources. They select, organise and represent data and information in different forms, using appropriate digital and spatial technologies and through special purpose maps that conform to cartographic conventions. They analyse and evaluate geographical data, maps and information using digital and spatial technologies and Geographical Information Systems as appropriate to develop identifications, descriptions, explanations and conclusions that use geographical terminology.

Students refer to significant events, the actions of individuals and groups, and beliefs and values to identify and evaluate the patterns of change and continuity over time. They analyse the causes and effects of events and developments and explain their significance. They explain the context for people's actions in the past. Students evaluate the significance of events and analyse the developments from a range of perspectives. They evaluate the different interpretations of the past and recognise the evidence used to support these interpretations.

Students sequence events and developments within a chronological framework, and identify relationships between events across different places and periods of time. Students construct and communicate an informative report about an issue of their choice using a range of reliable sources of evidence, visuals and data. In developing this report and organising and presenting their information, they use historical, geographic, political and economic terms and concepts, evidence identified in sources, and they use consistent referencing of these sources.

7.2C Assessment

- Group Presentations
- Video and Film Recordings
- Research Projects
- Written Reports
- Fieldwork Report
- Tests
- End of Semester Exams

7.3 MATHEMATICS

Overview

Mathematics is a unique and powerful way of viewing the world to investigate patterns, order, generality and uncertainty. Mathematics is a universal language that crosses all cultural and linguistic boundaries and enables problems to be solved across a diverse range of disciplines such as science, engineering, business, finance, technology and the arts. Mathematics enhances your ability to think quickly, rationally, logically and abstractly, and to understand complex concepts. It also improves your general problem solving ability for use in all facets of life.

A CORE MATHEMATICS

R

Requirement

At Year 10 level all students will do Core Mathematics unless they meet the requirements for VCE Mathematical Methods 1 +2.

7.3A-A Curriculum Focus

The Core Mathematics unit is intended to thoroughly prepare students to undertake all Mathematics at the VCE level and to support students in their endeavours in all areas of study in Year 1 at John Monash Science School and beyond. In particular students will study mathematics that is relevant to the Core Science unit and that will enable them to pursue, with confidence, mathematical reasoning and inquiry in all their Science core and elective units and in studies within their other blocks.

Students will be required to perform computations involving natural numbers, integers, finite decimals and surds without the aid of technology, giving exact answers as applicable.

A strong emphasis will be on developing a student's mathematical thinking ability through the use of inquiry and the exploration of proof. Student's learning and understanding of mathematical skills and concepts will be supported through the use of appropriate technologies such as Wolfram Mathematica, spreadsheets, graphing and geometry software packages and statistical analysis tools.

In Core Mathematics students will be encouraged to think deeply about the mathematics they are studying, pursue areas of interest to them and to discuss and express their thoughts and reasoning with their peers and teachers in a variety of ways.

7.3A-B Learning Outcomes

The areas of study in the Core Mathematics course will include, but not be limited to:

- Algebra;
- Linear Functions and Relations;
- Trigonometry;
- Statistics and Probability;
- Quadratic Functions and Equations;
- Exponential and Logarithmic Functions;
- Measurement and Geometry.

7.3A-C Assessment

Students will be assessed through a variety of methods including tests, investigations, problem solving activities and analysis tasks.

B VCE MATHEMATICAL METHODS 1+2

R

Requirement

To be eligible to undertake VCE Maths Methods 1+2, Year 10 students must demonstrate that they have been successfully working at an accelerated level at their previous school.

i

Mathematical Methods Assessment

Students wishing to take this subject at Year 10 level are required to sit the *Mathematical Methods Assessment.*

7.3B-A Curriculum Focus

VCE Maths Methods is a prerequisite for many University Science and Maths courses.

This course is aimed at those students who wish to study Mathematical Methods 3 and 4 and/or Specialist Maths in Year 12. The course is composed of five (5) areas of study:

1. Functions and Graphs
2. Algebra
3. Calculus
4. Probability
5. Circular (trigonometric) functions.

7.3B-B Learning Outcomes

On completion the student should be able to:

Outcome 1

Define and explain key concepts as specified in the content from the 'Functions and Graphs', 'Algebra', 'Calculus', 'Circular Functions' and 'Probability' areas of study, and apply a range of related mathematical routines and procedures.

Outcome 2

Apply mathematical processes in non-routine contexts and to analyse and discuss the application of mathematics.

Outcome 3

Use technology to produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.

7.3B-C Assessment

Students will be assessed through a variety of methods including tests, investigations, problem solving activities and analysis tasks.

7.4 CORE SCIENCE

Overview

Core Science is a year-long subject at John Monash Science School that addresses the key knowledge and key skills at the Year 10 level and beyond. It has been specifically designed as a pathway to the successful study of any and all of the VCE sciences. Therefore, all students will undertake this study in their first year at JMSS.

Students will gain an understanding of the sciences through designing and carrying out experiments and through inquiry-based learning. Teamwork and use of ICT are important skills students will develop throughout the year.

Requirement

Core Science is a compulsory subject for all Year 10 students at John Monash Science School. Students will complete Core Science alongside Data Science and Enrichment STEM Elective(s).

Extended Experimental Investigation

Through Core Science, all Year 10's also carry out their self-selected *Extended Experimental Investigation (EEI)*. This is a major investigation that enables students to pursue an area of interest for an extended period of time.

7.4A Curriculum Focus

Students will be provided with a variety of learning experiences from the fields of Biology, Chemistry, Geoscience and Physics. These experiences will be based on regular experimental activities based on the collection of empirical evidence, data analysis, problem solving, modelling, research investigations and the introduction to innovative and cutting-edge technologies. Experiments, hands-on activities and extension activities are an integral part of Core Science in Year 10.

The year-long course is divided into 2 main parts:

Semester 1:
Fundamental Knowledge and Skills

Throughout Semester 1 students develop key understandings from across the Sciences that underpin further studies in all VCE Sciences. Students will gain a detailed appreciation of Science as Human Endeavour and develop Science Inquiry Skills, including experimental design, technique and scientific communication.

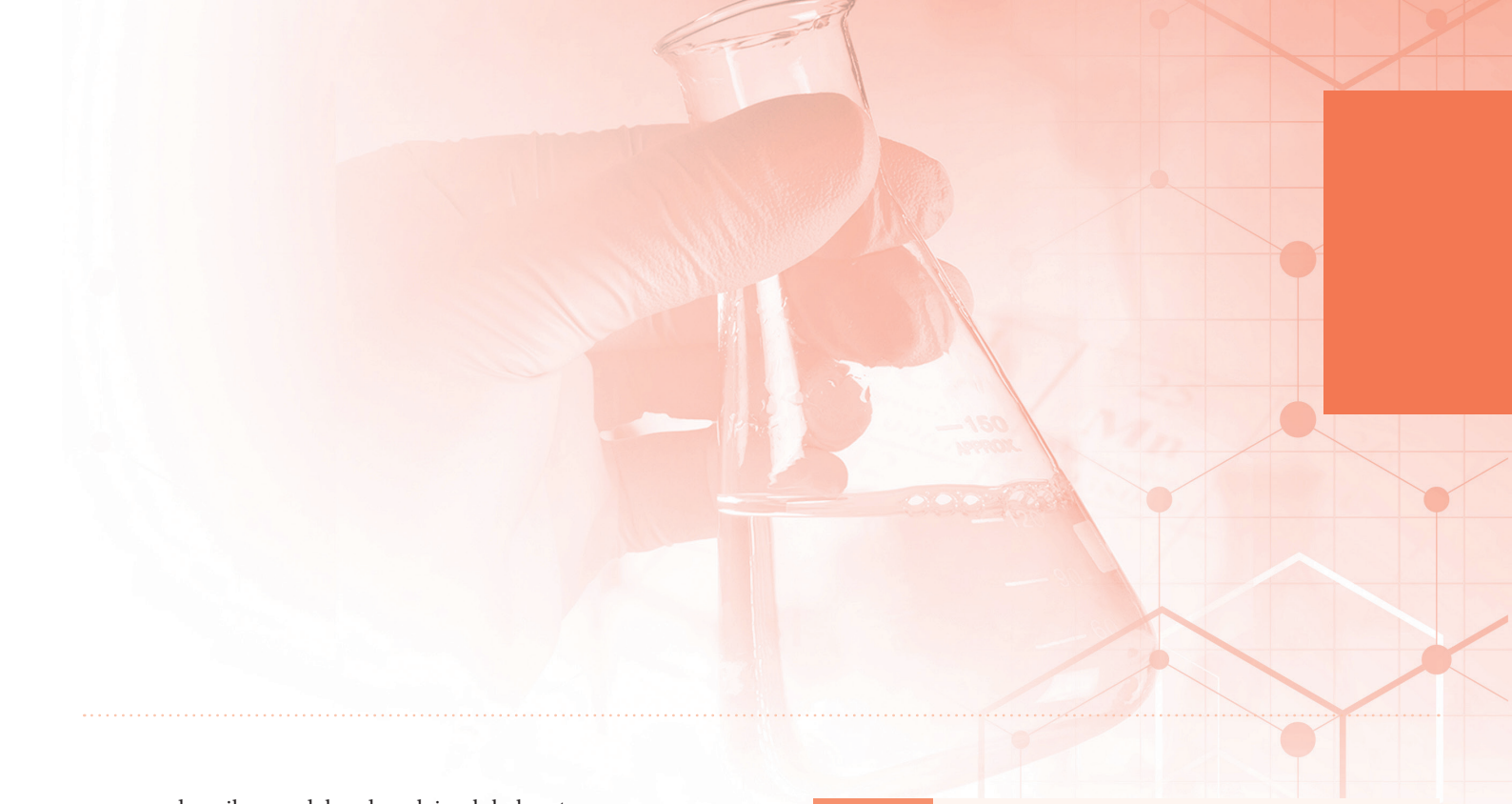
Semester 2:
Extended Experimental Investigation (EEI)

In Semester 2 students focus on using and refining the skills that they have developed in order design and carry out a STEM investigation of their choosing. EEI projects are presented at JMSS's annual Australian Science Fair to an audience of academics, researchers, community leaders, peers, family and members of the wider JMSS community.

7.4B Learning Outcomes

On completion, students will be expected to:

- describe relationships between energy, mass, acceleration and velocity;
- describe energy transfers, transformations and conservation in a system;
- describe and predict the motion of objects using the laws of physics;
- understand and write balanced chemical equations for key chemical reactions;
- describe how and why certain factors affect the rate of a chemical reaction;



- describe, model and explain global systems, including the carbon cycle, and the impact of human activity on global systems; and,
- describe, model and represent the structure and role of DNA, and understand DNA and genes as the genetic basis of inheritance.

The skills developed by students will include students being able to:

- formulate questions or hypotheses that can be investigated scientifically;
- plan, select and use appropriate investigation methods, including field work and laboratory investigation to collect reliable data;
- assess risk and address ethical issues associated with these methods;
- analyse patterns and trends in data, including relationships between variables and identifying inconsistencies;
- use, analyse and represent quantitative and qualitative data in a variety of formats;
- evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe ways to improve the quality of the data; and,
- communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations.
- use artificial intelligence (AI) tools in a manner appropriate for scientific research and investigation.

7.4C Assessment

- Extended Experimental Investigation
- Practical Activities
- Data Analysis Investigation
- Research Projects
- Topic Tests and Exam

7.5 DATA SCIENCE

Overview

Computer programming and computational thinking is an essential skill in all scientific, mathematical and medical fields. At JMSS we are proud to be offering engaging and well-paced subjects that develop and extend our students' knowledge and confidence in these areas.

A *Data Science:* INTRODUCTION TO GAMES PROGRAMMING

R

Requirement

Data Science is a compulsory subject for Year 10 students at John Monash Science School. Students may choose to complete either 'Introduction to Games Programming' OR ' Introduction to Programming, Machine Learning and Simulations' as part of their Year 10 studies.

7.5A-A Curriculum Focus

In this subject students will be introduced to the basics of Python programming, Data Science, and Game Programming. Students will learn how to write Python programs to help them solve various problems. They will also be introduced to the basic skills for analyzing large data sets and how to construct various charts in Google sheets. These skills will be invaluable in the other fields of science they study.

Students will also learn about how to plan and develop a game, and will apply the skills they have learnt to develop their own game in Python.

7.5A-B Learning Outcomes

Develop knowledge and applied skills in the following areas:

Python Programming

Data Science

Game Programming

On completion, students will be expected to be able to: write Python programs using variables, integers, floats, strings, selection statements, loops, lists, and functions; analyze large data sets, and construct column charts, histograms, box plots and scatter plots in Google sheets; develop and write a game in Python.

7.5A-C Assessment

- Programming task
- Data analysis investigation
- Game program

B

Data Science: INTRODUCTION TO PROGRAMMING, MACHINE LEARNING AND SIMULATIONS

R

Requirement

Data Science is a compulsory subject for Year 10 students at John Monash Science School. Students may choose to complete either 'Introduction to Games Programming' OR 'Introduction to Programming, Machine Learning and Simulations' as part of their Year 10 studies.

7.5B-A Curriculum Focus

In this subject students will be introduced to the basics of Python programming, Data Science, Machine Learning and Simulations. Students will learn how to write Python programs to help them solve various problems. They will also be introduced to the basic skills for analyzing large data sets and how to construct various charts in Google sheets. These skills will be invaluable in the other fields of science they study.

Students will also learn about how to train and test Machine Learning algorithms, and they will apply the skills they have learnt in programming and data science to develop a simulation and analyze the results.

7.5B-B Learning Outcomes

Develop knowledge and applied skills in the following areas:

Python Programming

Data Science

Machine Learning

Simulations

On completion, students will be expected to be able to:

- write Python programs using variables, integers, floats, strings, booleans, selection statements, loops, lists, and functions;

- analyze large data sets, and construct column charts, histograms, box plots and scatter plots in Google sheets;

- train and test neural networks, tree classifiers, kNN, and k-means; program a simulation in Python.

7.5B-C Assessment

- Programming task
- Data analysis investigation
- Machine learning investigation
- Simulation programming task

7.6 PHYSICAL EDUCATION

Overview

Physical Education is a core study for all Year 10 students and will consist of both practical and theory sessions. John Monash Science School recognises that physical activity is linked to emotional well-being and academic performance. Apart from the associated health benefits, it is also a means of releasing tension and aiding relaxation.

Physical Education classes will access the impressive array of sporting facilities at Monash University as well as the hard court facilities on our own school grounds. The Year 10 program will include a mixture of individual and team sports, and competitive and non-competitive activities. Physical Education also incorporates aspects of Health and the JMSS Learn To program to develop the whole student.

Requirement

R

All students will complete Physical Education, including our specialised 'Learn To' units at Year 10 level.

7.6-A Curriculum Focus

To provide students with experiences that allow them to access and engage in physical activity. To experience the physical and emotional benefits of physical activity.

To build the confidence and competence to seek out physical activity as a method to regulate their own overall wellbeing. This ties in with Health through Nutrition, Lifestyle Illness, Harm Minimisation and Mental Health.

In addition students explore (in the 'Learn To' unit) stress management, goal setting and develop a Career Action Plan in preparation for Work Experience and Subject Selection.

7.6-B Learning Outcomes

To develop the knowledge, understanding and skills to enable students to access, evaluate and synthesise information to take positive action to protect, enhance and advocate for their own and others' health, wellbeing, safety and physical activity participation across their lifespan.

Sports and Activities

Term One	Orienteering, Tennis, Ultimate Frisbee, Wheelchair Basketball
Term Two	Basketball, Squash, Indoor Soccer, Minor Games
Term Three	Squash, Badminton, Indoor Soccer, Volleyball 'Own game' presentations
Term Four	Indoor Hockey

7.6-C Assessment

- Lifestyle Illness Report
- Planning an Activity
- 'Own Game' Presentations
- Career Action Plan

JOHN MONASH
SCIENCE SCHOOL

I
7.7 - 7.7

P2

Section Seven:

INDEX OF AVAILABLE SUBJECTS

STEM ELECTIVES



I
7.7 - 7.11

Section Seven: ENRICHMENT STEM ELECTIVES

7.7

Enrichment STEM ELECTIVES

Enrichment STEM allows students to study aspects of science in which they are particularly interested in greater depth. Each study maximises the resources available to the school from Monash University and its staff. Students have the chance to enrich their perspectives and knowledge of the sciences by studying the latest research and innovations, and having access to practising scientists. Both of these elements are generally unavailable in traditional school settings. Students choose 2 Enrichment STEM Elective subjects in each semester in Year 10.

There are a large range of subjects available to students, many of which are interdisciplinary across the STEM subject areas, plenty to capture the curious minds and hearts of our young scientists!

These electives are often equivalent to, or higher in standard than VCE Unit 1 and 2 subjects. Students can also use some Enrichment STEM subjects to access an accelerated pathway through VCE so that they can undertake University Enhancement as part of their studies in their final year at the school.

i

Study Pathways

When selecting Enrichment STEM Electives, students should also consult the Study Pathways provided in *Section Eight: Curriculum and Pathways* and take this information into consideration.

Enrichment STEM Elective – Selection Rules

Students select 4 Enrichment STEM elective subjects across the year. One of these subjects must be either:

7.5A *Data Science: Introduction to Games Programming*

or

7.5B *Data Science: Introduction to Programming, Machine Learning and Simulations*

Students then select three elective subjects from those shown in the Table of Enrichment STEM Electives on page 63.

Note that students will be asked to also select several reserve subjects. The number of each elective class that runs will depend on the number of enrolments and on staffing.

VCE Physics is considered an acceleration pathway, and placement in this course is subject to a selection process. Students may choose to apply for VCE Physics in Year 10.

The selection processes for VCE Physics involves multiple stages. Students can apply for this course near the end of Term1, 2027.

Teacher Approval Process (VCE Physics): Teachers will be asked to provide feedback on students who have expressed interest in accelerated STEM. This will be based around a student's readiness to take on an accelerated study and will use indicators such as attendance, attitude/ application in class and organisation.

Overall Academic Performance (Advanced Chemistry and VCE Physics): The accelerated courses move at a quick pace and is at a VCE level. It is important that students have a strong overall academic performance in order to be successful in the accelerated course while continuing to be successful in their other subjects. As such, the Term 1 academic performance in each in each subject, along with entrance data of students will be evaluated.

Entry Assessment (Advanced Chemistry only): Following the above evaluations, selected students will be invited to complete an entry assessment from this the final class list will be determined.

Please note that taking an advanced STEM subject does not automatically lead to Unit 3/4 in Year 11.

7.7 P2 *Subject Selection* STEM ELECTIVE SUBJECTS

Table of Enrichment STEM Electives

		Subject	Notes	Quota	BIO	CHM	ENV	ENG	GEO	ICT	MTH	PHY
Ds	7.5A	Introduction to Games Programming								•		
	7.5B	Introduction to Programming, Machine Learning and Simulations								•		
C_1	7.7J	Disease , Disorders & Scientific Discoveries			•							
	7.7B	Aquatic Fieldwork Science			•		•					
	7.7D	Biotechnology			•							
	7.7K	Pharmaceutical Science			•	•						
	7.7A	Analytical Spectroscopy				•						
	7.7H	Microbiology			•							
	7.7L	Terraforming Mars			•		•		•			•
	7.7F	Tiny Village Design				•				•		•
	7.7E	Materials Science and Engineering				•		•				•
	7.7I	Nature and Beauty of Mathematics									•	
	7.7G	Medical Physics			•							•
	7.7C	Astrophysics										•
	7.7N	Decoding Light				•						•
C_2	7.7M	VCE Physics	S2 Only									•

Ds

Data Science
Students must choose one Data Science subject to complete at Year 10 level.

C_1

STEM Electives – Choose five and you will be allocated three out of the five.

C_2

STEM Acceleration
Accelerated pathways in Physics is via application at the end of Term 1, 2027.

- • Branch of STEM addressed in elective

BIO	Biology	**GEO**	Geoscience
CHM	Chemistry	**ICT**	Information Technology
ENV	Environmental Science	**MTH**	Mathematics
ENG	Engineering	**PHY**	Physics

7.7 *Enrichment* STEM ELECTIVES

A ANALYTICAL SPECTROSCOPY

7.7A-A Curriculum Focus

This unit will explore the analytical and spectroscopic techniques used in chemistry. These essential techniques are currently used to qualitatively and quantitatively identify chemicals, such as salt content in water, molecular components in vegetable juices and petrol.

Chromatography is a technique that is used to separate the substances present in a mixture and is widely used to determine the identity of these substances. Its applications include the detection of drugs present in blood, and hydrocarbons in oil.

All forms of spectroscopy use a part of the electromagnetic spectrum to give vital information on the tested material. The varying parts of electromagnetic radiation interact with differing parts of the material and by analysing the data, valuable information is obtained on the qualitative and quantitative nature of the material. The spectroscopic applications include the concentration of minerals in water, the determination of blood alcohol limits in drivers, forensic analysis of paints, dyes and fibre samples.

Titration is a volumetric analysis technique that enables accurate measures of the concentration of the unknown solution to be determined. This technique is used to find the concentrations of acids and bases.

This unit focuses on some of the experimental techniques used in future units of chemistry and will access the university's chemistry laboratories to enhance the understanding of the techniques.

7.7A-B Learning Outcomes

At the completion of this unit students will be expected to:

- Understand the principles of chromatography;
- Apply these principles to the interpretation of data from thin-layer chromatography (TLC), gas chromatography (GC) and high performance liquid chromatography (HPLC);
- Understand the principles of spectroscopy;
- Apply these principles to the interpretation of data from flames tests, atomic emission spectroscopy (AES), atomic absorption spectroscopy (AAS), colorimetry, UV-visible spectroscopy and infrared spectroscopy (IR);
- Understand the basic analytical principles of titration;
- Use chemical titration equipment;
- Apply these principles to the interpretation of data from simple chemical titrations.

7.7A-C Assessment

- Laboratory practical work.
- Research report based on one of the spectroscopic techniques.
- Practical tests



7.7

Enrichment STEM ELECTIVES

B

AQUATIC FIELDWORK SCIENCE

7.7B-A Curriculum Focus

This unit will explore freshwater and marine ecosystems. It will have a strong focus on using fieldwork techniques to help us to determine the physical, chemical and biological characteristics and interactions of selected aquatic environments. A diverse range of environments are explored through a local and global context and students will also learn about cutting-edge research in aquatic sciences.

The organisms which inhabit aquatic habitats will be examined through student-centered inquiries into the unique aspects of form and function which enable these organisms to specialise to live in various aquatic environments. Aspects of their amazing diversity and fascinating interactions with other species to create ecosystems are also studied.

Student research is complimented with classroom activities, fieldwork, and laboratory lessons centered on sampling, microscopy and organism dissection skills. Learning is through observation, discussion, hypothesis, examination of the evidence, listening and questioning - useful skills for the Extended Experimental Investigations students will undertake in Semester Two Core Science classes. Students will present some of their fieldwork findings and dissection skills at the Enrichment Science Night in Term 2.

This class is multidisciplinary, incorporating some aspects of physics, and analytical and spectroscopic techniques used in chemistry. For example, we can qualitatively and quantitatively identify chemicals using colorimetry to analyse mineral content in water, and then consider how these affect which biological organisms can live there. Aquatic fieldwork techniques such as capture & release, surveys, and identification will also be explored. Students also have access to a variety of experts through fieldwork and presentations from guest scientists at Monash University and other institutions.

Students will also consider and critique human impacts on aquatic life as well as issues of sustainability and the conservation in the effective management of aquatic resources. The adverse implications of human practices such as pollution, oil spills, and climate change are also examined. Sustainability is explored through the notion that current and future generations are responsible for building upon our prior knowledge of freshwater and ocean ecosystems and their potential to help meet the future needs of the world.

7.7B-B Learning Outcomes

The practical components of the subject include laboratory exercises, day trips or excursions, and modeling activities. These will enable students to see or experience first-hand how aquatic biologists carry out their research.

Students will undertake individual and team-based projects and investigations. The laboratory exercises and field trips will enhance student skills in scientific inquiry and method, teamwork, data gathering and analysis, report writing, problem-solving, and presentation skills.

7.7B-C Assessment

- Fieldwork and Dissections/Lab Book.
- Research Projects.
- Team Oral Presentations.
- Tests.

i

Reef and Rainforest Trip

Please note that this subject *does not* involve any snorkelling or diving, and is not related to the Year 11 Reef & Rainforest trip.

C ASTROPHYSICS

7.7C-A Curriculum Focus

Students will grapple with the nature of time, space and energy as they work towards determining the possibilities of encountering alien life in our Galaxy and beyond.

At the same time, students will be exposed to up-to-date research into the Solar System and Extrasolar planets. They will learn about the fundamental requirements for life and identify characteristics that define intelligence.

Students will explore the driving factors that lead to the evolution of a planetary civilisation and then explore possible future civilisation types and their energy requirements. The course will delve into the realms of science fiction as topics such as interstellar travel, communication with alien civilisations, the colonisation of other worlds and time travel are all explored in depth.

By studying this subject, students will gain a better appreciation for the mystery and beauty of our existence in the Universe.

7.7C-B Learning Outcomes

At the completion of this unit students will have an appreciation of the major themes in the areas of astrophysics and cosmology. This will include:

- The Big Bang and possible fates of the Universe;
- Stellar Evolution and Black Holes;
- The Solar System and Extrasolar Planets;
- The Drake Equation;
- Factors that lead to and are necessary for the development of life;
- Civilisation Types;
- Space travel;
- Einstein's Special Theory of Relativity and time travel; and,
- The possibility and nature of Artificial Intelligence.

7.7C-C Assessment

- Individual and group project tasks
- Semester examination

7.7

Enrichment
STEM ELECTIVES

D

BIOTECHNOLOGY

7.7D-A Curriculum Focus

This subject explores how we use technology to understand genetic codes.

The sequence for an individual or species can now be generated quickly and cheaply, resulting in an explosion of information. Students will develop skills to decipher this information and further understand the code for life.

Throughout the semester, students will explore:

- Genetics in history, placing Bioinformatics in context within a broader field;
- The structure and function of the cell, DNA and proteins;
- The biological and social aspect of genetic disorders;
- The development of genetic technology.

7.7D-B Learning Outcomes

Upon completion of this unit, students will have learnt about various aspects of bioinformatics. More specifically, students will gain a basic understanding of each of the techniques involved in producing and analysing a genetic sequence.

Furthermore, students will learn the potential for bioinformatics to facilitate the development of new drug designs and therapies. Students will gain practical experience in state of the art laboratory techniques, learn more about the scientific method, and work with others to develop skills for effective communication and teamwork.

This subject has good support from many Monash staff and external scientists, which means that students have access to many guest visitors, as well as visits to Monash University and beyond.

7.7D-C Assessment

A key skill for scientists is effective communication. To promote this, students will be required to present their findings as a scientist would, as well as write reports on guest speakers and research topics. Assessment will also include practical reports, research presentations, topic tests and an examination.

There will be two major research projects during the semester.

The first project is a research task where students choose a genetic-based topic of their interest, where students prepare a grant proposal as one would do in the research profession

For the second project, students will explore a specific genetic technology and present their findings at an exhibition evening. In addition to producing a professional final submission, both projects place a strong emphasis on documenting and planning the research process.

7.7

Enrichment STEM ELECTIVES

E

MATERIALS SCIENCE *and* ENGINEERING

7.7E-A Curriculum Focus

Are you interested in knowing more about the "stuff" around you and what "stuff" may be made of in the future? Materials Science and Engineering is a multidisciplinary subject that draws on areas of chemistry, physics and engineering. The subject focuses on the exploration of structure and properties of materials as well and the future of materials science, with a particular emphasis on additive manufacturing (3D printing).

The course is an introduction to the engineering design process. Students can expect a "hands on" approach to learning ranging from the use of models and simple practical activities through to student designed experiments and competitions. A feature of the course is the opportunity for students to design their own product prototype using a user-friendly CAD program and have it 3D printed.

Through our links with Monash University School of Materials Science and Engineering, students will be exposed to traditional and cutting edge technologies in the field of materials science, and hear from researchers at the tops of their fields.

7.7E-B Learning Outcomes

- Understand the link between the structure of a material and its properties;
- Understand and investigate key mechanical properties of materials;
- Explore traditional and advanced materials and methods used to produce them;
- Develop an understanding of the engineering design process;
- Develop the physics and engineering principles used to test materials;
- Use CAD to design a product prototype for production via 3D printing;
- Consider the ethical implications of materials used in modern society; and,
- Design and carry out practical activities in a safe manner.

7.7E-C Assessment

- Design project
- Research and practical task write-up
- Topic reflections
- Topic tests

7.7

Enrichment
STEM ELECTIVES

F

TINY VILLAGE DESIGN

7.7F-A Curriculum Focus

Students will work in groups to explore various factors that affect the construction and design of a sustainable, energy efficient village. The design can include lighting, energy collection and storage, heating and cooling and control systems to modify each of these elements.

This subject encourages creativity, teamwork, and practical application of scientific and engineering principles to solve real-world problems. Students will gain hands-on experience and a deeper understanding of sustainable design and energy management.

7.7F-B Learning Outcomes

1. Alternative Energy and Storage:

Investigate renewable energy sources such as solar, wind, and geothermal. Design systems for efficient energy collection and storage.

2. Lighting Systems:

Develop energy-efficient lighting solutions that reduce consumption while maintaining optimal illumination.

3. Heating and Cooling:

Explore sustainable heating and cooling methods, including passive solar design, insulation, and thermal mass systems.

4. Movable Parts:

Design spaces and entry and exits in a house that consider space, movement, airflow and lighting and can be controlled by simple machines or motors.

5. Controls, Sensors, and Alarms:

Implement advanced control systems to monitor and manage energy use, including sensors and alarms for safety and efficiency.

6. Final Challenge:

Integrate all elements into a comprehensive house design. Present the final project, demonstrating how each component contributes to the overall sustainability and energy efficiency of the building.

7.7F-C Assessment

- Lab work - logbook
- Project Portfolio – design and build a device
- Presentation on Element of Science-

  infographic or poster

G MEDICAL PHYSICS

7.7G-A Curriculum Focus

Looking beyond the capabilities of the human eye has enabled medical professionals to diagnostically image a human body. Physicists have harnessed the breadth of the electromagnetic spectrum, electrical conductivity and sound waves to visualise images of the human body that our naked eye would never be able to see.

X-rays, ultrasonic waves and radio-waves are a selection of the tools currently been used for imaging. The advent of the computer age has meant that images can now be interpreted and manipulated digitally. Critical decisions are made both by humans and machines on the basis of this information.

Medical Physics encompasses the creation of the image, the information carried by the image, the interpretation of the image and the medical emergencies that would need such images to be produced to understand the changes in anatomy and physiology. In this unit, students investigate questions such as:

- What can we see beyond our own sight?
- How can we see beyond the skin?
- What is in our body that enables images to be made?

Students will then build upon that knowledge to investigate medical imaging techniques such as ultrasound, X-ray, echocardiogram (ECG) and Magnetic Resonance Imaging (MRI). Students also learn principles of digital imaging and explore the extraction of information from digital images as well as digital image manipulation.

Students will then focus on the anatomy and physiology of the body to enable them to make decisions about which imaging techniques would be most suitable in the diagnosis of a range of conditions related to the heart, pregnancy and trauma.

7.7G-B Learning Outcomes

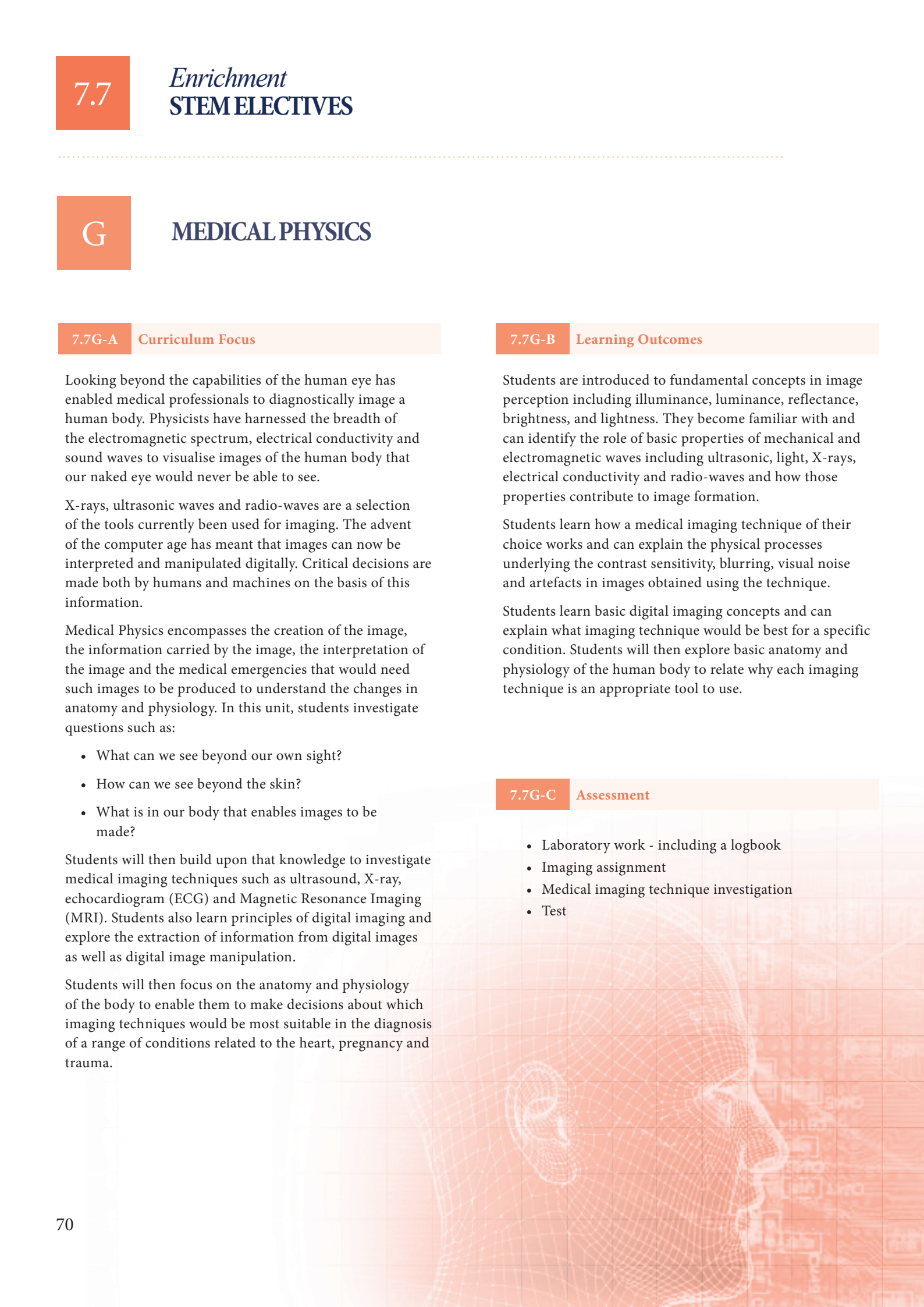
Students are introduced to fundamental concepts in image perception including illuminance, luminance, reflectance, brightness, and lightness. They become familiar with and can identify the role of basic properties of mechanical and electromagnetic waves including ultrasonic, light, X-rays, electrical conductivity and radio-waves and how those properties contribute to image formation.

Students learn how a medical imaging technique of their choice works and can explain the physical processes underlying the contrast sensitivity, blurring, visual noise and artefacts in images obtained using the technique.

Students learn basic digital imaging concepts and can explain what imaging technique would be best for a specific condition. Students will then explore basic anatomy and physiology of the human body to relate why each imaging technique is an appropriate tool to use.

7.7G-C Assessment

- Laboratory work - including a logbook
- Imaging assignment
- Medical imaging technique investigation
- Test



7.7

Enrichment STEM ELECTIVES

H

MICROBIOLOGY

7.7H-A Curriculum Focus

This elective science will provide a foundational understanding of microbiology, regenerative medicine and physiology, histology and cytology, and recent innovative strategies that are being developed to prevent/treat medical problems. Excursions and guest speakers will expose students to current research taking place.

This subject consists of several topic areas:

- Bacteria
- Histopathology
- Stem Cells and Next Generation Medical Therapies

Underlying these units is a key understanding of cell function and reproduction. The course will look at the categorisation, biology, and use of microorganisms, not just from a medical perspective, but how these microorganisms can be used for research, both as a model, and as a tool.

Microbiology is not only a field in medicine, but the basic skills and techniques of a microbiologist are required for most biological sciences. Histopathology, the microscopic study of diseased tissue, is an important tool in anatomical pathology since accurate diagnosis of cancer and other diseases usually requires histopathological examination of samples.

There is a worldwide shortage in nearly all sectors of laboratory medicine, resulting in these skills becoming particularly useful for the future.

7.7H-B Learning Outcomes

By the end of this subject, students will have an understanding of:

- How bacteria and other microbiological organisms can be both beneficial and detrimental to human, animal, and plant health;
- Various treatments and preventative measures for dealing with microflora such as antibiotics and the growing issue of antibiotic resistance;
- Asepsis, sampling, plating, growth, and analysis techniques for bacteria;
- Ames tests, Gram staining, and other tools for classifying bacteria;
- Preparing and analysing tissue samples;
- Microscope techniques and safe lab practices;
- The nature of stem cells and their value to research and treatment;
- Recent cutting-edge and innovative therapies that use biomaterials to treat diseases and disorders;
- Working productively in small groups and researching effectively;
- Carrying out scientific procedures, accurately recording data and analysing results; and,
- Communicating scientifically, including in written, visual and oral presentations.

Students will also present some of their experimental findings and practical skills at the Enrichment Science Night in Term 2.

7.7H-C Assessment

- Practical Exercises & Experiments
- Oral Presentations
- Tests
- Research Project

7.7 *Enrichment* STEM ELECTIVES

I NATURE *and* BEAUTY *of* MATHEMATICS

7.7I-A Curriculum Focus

Mathematics is the language of the universe, the language of science and engineering. It allows us to make better decisions about our daily lives and build a better world. At the same time, it is as much art as it is science, full of its own beauty and wonders.

In this unit students will be introduced to exciting and challenging topics outside the usual school curriculum. Examples include (but are not limited to) infinity and its fundamental role in modern mathematics, visualising higher dimensions, the golden ratio and the Fibonacci numbers in nature, the mathematics of optimal design (soap films, shortest networks, travelling salesman problem), 3-dimensional manifolds as the possible shapes of our universe, the nature of numbers (primes, codes and cryptography), fractals, mathematical paradoxes and the mathematics of card shuffling and magic tricks.

This unit is intended for students in Year 10 at John Monash Science School.

Other than Year 9 Mathematics, there are no prerequisites, however a strong understanding and enthusiasm for mathematics is expected.

7.7I-B Learning Outcomes

In this course, students will gain an understanding of what it means to be a mathematician by developing skills in experimentation, visualisation and communication of complex mathematical theories. They will learn to appreciate the nature, power and beauty of mathematics. They will use mathematics as a universal key to making sense of the world, a key that enables them to master any other subject or skill.

Central to mathematics is problem solving. Students will be given a wide variety of problems and, on completion of this course, they will be expected to articulate both their solutions and their processes to answering questions.

Specifically, students will be able to use and analyse real data to make informed predictions, calculate the aesthetic properties of nature and social constructs, and describe mathematics in the context of history and culture.

Students will work individually and collaboratively on topics of personal interest and develop the skills to effectively communicate and present mathematical understanding. Opportunities will be provided to present to the school community, university academics and the general public.

7.7I-C Assessment

- Explorative tasks
- Research projects
- Semester Examination

7.7

Enrichment
STEM ELECTIVES

J

DISEASE, DISORDERS & SCIENTIFIC DISCOVERIES

7.7J-A Curriculum Focus

Have you ever wondered about the science that underlies human health and disease? Having an understanding of how the human body works allows scientists to develop new treatments and preventions for different disease states. In this elective unit, students will be introduced to biomedical science. We will explore the anatomy and physiology of a number of human disorders, focussing on the cardiorespiratory, neural and reproductive systems. By investigating these diseases, students will gain an understanding of the important contribution biomedical research makes to our society and how biomedical science underpins modern medicine.

Throughout this unit students can expect a hands-on approach to learning. This will include collaborative activities, active learning exercises and practical sessions that allow exploration of the underlying theory as well as a chance for students to investigate their own physiology. Through our links with the Monash Biomedicine Discovery Institute, students will also be exposed to cutting edge research in the field of biomedical science, and hear from researchers at the tops of their fields.

7.7J-B Learning Outcomes

By the end of the unit, students are expected to be able to :

Define the roles of the neuromuscular, cardiorespiratory and reproductive systems in regulation of normal human function

Describe how human health and disease is dependent on the regulation/dysregulation of interrelated organ systems

Explain how biomedical science underpins modern medicine and advances in improved diagnosis, treatment and prevention of disease

Work productively with their peers to produce collaborative projects

Communicate scientifically via written, visual and oral presentations

7.7J-C Assessment

- Topic tests
- Creative Assignment

7.7

Enrichment STEM ELECTIVES

K

PHARMACEUTICAL SCIENCE

7.7K-A Curriculum Focus

In this subject the notion of what is meant by 'From Bench to Bedside' is explored. Students learn about the process of discovering, testing and eventually gaining approval for selling a drug. They explore the thinking, planning and approximate length of time that is required for each stage of discovery and development of a medicinal drug, right through to how it is administered to a patient, and then how that drug makes its way to its target.

The course is an intersection between chemistry and biology and will include exposure to fundamental ideas from these domains as well as the more specialised fields of Formulation Science and Medicinal Chemistry.

Formulation Science:
Students learn how to formulate, design and evaluate pharmaceuticals;

Medicinal Chemistry:
Medicinal chemistry is at the intersection of biology and chemistry. It is specialised chemistry that deals with how drugs work, how they are designed and how they are made. Students will gain a broad range of skills, which traverse the full range of the drug development cycle.

Students will focus on the structure and development of pharmaceutical drugs and how they can act in order to treat disease. In doing so, they will gain a broad range of skills, which traverse the full range of the drug research and development process.

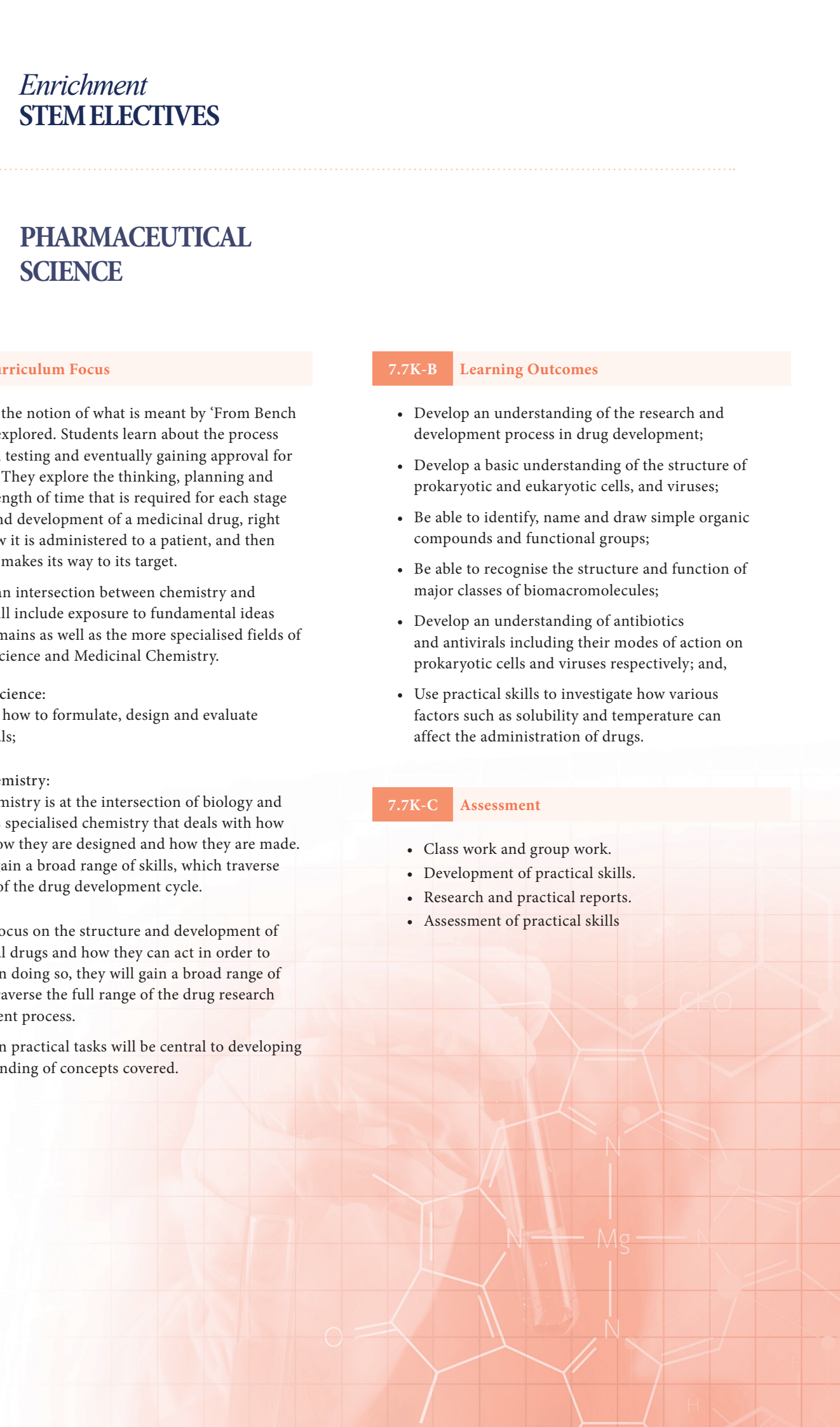
Participation in practical tasks will be central to developing a full understanding of concepts covered.

7.7K-B Learning Outcomes

- Develop an understanding of the research and development process in drug development;
- Develop a basic understanding of the structure of prokaryotic and eukaryotic cells, and viruses;
- Be able to identify, name and draw simple organic compounds and functional groups;
- Be able to recognise the structure and function of major classes of biomacromolecules;
- Develop an understanding of antibiotics and antivirals including their modes of action on prokaryotic cells and viruses respectively; and,
- Use practical skills to investigate how various factors such as solubility and temperature can affect the administration of drugs.

7.7K-C Assessment

- Class work and group work.
- Development of practical skills.
- Research and practical reports.
- Assessment of practical skills



7.7

Enrichment STEM ELECTIVES

L

TERRAFORMING MARS

7.7L-A Curriculum Focus

In this elective science unit students will look from Earth to Mars to investigate the feasibility of colonising and living on Mars in the future. Students will develop an understanding of Earth's systems and processes and through a combination of fieldwork, experiments and practical tasks determine the steps needed to take by humankind to turn Mars into a planet upon which we can live.

Students will use analoges of Earth to research how the atmosphere, lithosphere, biosphere and hydrosphere of Mars can be adapted toward human habitation. Using Design Thinking framework, students will work in their interest area to collaboratively explore and design future systems on Mars by understanding Mars' geological and atmospheric structure, human energy requirements and what would be required to replicate conditions needed for Earth type organisms' survival. The project each group undertakes will be determined by the group's shared interests. The group projects will require students to design, trial and analyse simulations to determine the effectiveness of terraforming Mars.

Students will have access to "real" Mars rover data to help inform their decisions. Collaborative work will require fortnightly meetings to update the group on recent progress and propose then agree future research/experimental directions.

7.7L-B Learning Outcomes

At the completion of this unit, students will be expected to:

- Consider and justify the ethical implications of their actions;
- Understand the global systems interactions between the Earth and its four spheres and describe these interactions at a range of scales;
- Apply their understanding of Earth's systems to the planet Mars and comparisons between the Earth's systems and Mars' systems; and,
- Understand and describe Mars as a planet of our solar system including its key features such as; core structure, climate, soil composition, biosphere, atmosphere, lithosphere, magnetic field (or lack thereof), orbital mechanics and system interactions between these components.

Students will explore ancient Mars to understand how Mars was formed and how its conditions changed over the past 4.6 billion years.

Students will develop their understanding and skills in scientific literacy through unit readings, learning tasks, presentations at regular team meetings and literacy focused case studies.

An important feature of the Terraforming Mars science elective is the opportunity for students to undertake a range of inquiry tasks both collaboratively and independently. Inquiry methodologies that students will engage with include; laboratory investigations, fieldwork that may also involve use of technologies and sampling techniques, case studies, simulations, animations, literature reviews and the use of local, global and Mars Rover databases.

Students will be able to pose questions, learn and hone practical scientific skills, formulate hypotheses, collect and analyse data, evaluate methodologies and results, justify conclusions and communicate their finding. They will investigate and evaluate issues, changes and alternative proposals by considering both longer and shorter term consequences for the individual, the environment and society.

7.7L-C Assessment

- Poster presentation comparing Mars to Earth; including the four spheres (atmosphere, biosphere, lithosphere and biosphere).
- Terraforming Mars Scientific Investigation and Simulation Design.
- Practical Reports/Fieldwork Reports or Logbook

7.7

Enrichment STEM ELECTIVES

M

VCE PHYSICS: MOTION AND ELECTRICITY *and* EXTENDED INVESTIGATION

i

Pre-Requisites

Please note: this subject is only run in Semester 2.

VCE Unit 2 Physics is a prerequisite for VCE Unit 3 and 4 Physics.

Students may apply for this subject in Term 1, 2027. Please see Page 62 for an overview of the selection process.

7.7M-A Curriculum Focus

This VCE unit consists of two prescribed areas of study:

1. Motion;

2. Electricity.

plus an Extended Practical Investigation into an aspect of either Motion, Electricity or in some special cases, into a special area of study described by one of the twelve Detailed Studies.

7.7M-B Learning Outcomes

Outcome 1

Students should be able to investigate, analyse and mathematically model the motion of particles and bodies.

Outcome 2

Students should be able to investigate and apply a basic DC circuit model to simple battery- operated devices and household electrical systems, apply mathematical models to analyse circuits, and describe the safe and effective use of electricity by individuals and the community.

Outcome 3

Students should be able to design and undertake an investigation of a physics question related to the scientific inquiry processes of data collection and analysis, and draw conclusions based on evidence from collected data.

7.7M-C Assessment

- Area of study tests.
- Practical reports.
- Summary report on selected practical activities.
- Extended practical investigation poster.
- Semester examination.

7.7

Enrichment
STEM ELECTIVES

N

DECODING LIGHT:
Advanced Experimental Science

7.7N-A Overview

Light carries information about the world around us. From the colours of leaves to the composition of distant stars, scientists use spectroscopy to reveal information that cannot be observed directly. In this subject, students explore how light can be measured, analysed and interpreted to answer scientific questions about matter, energy and the natural world.

Students will work in collaborative teams, in consultation with a Scientist in Residence and their own class teachers, to build, code and operate the PicoSPEC spectrometer. This spectrometer will serve as a platform for investigation, and students will engage in authentic STEM learning that integrates science, technology, engineering, and mathematics. Students will explore how spectrometers separate light into its component wavelengths, how instruments are designed, constructed and calibrated, and how raw measurements are transformed into meaningful scientific data.

Through practical investigations, students will examine atomic emission spectra, molecular absorption, fluorescence, concentration measurements and environmental applications. They will develop and test hypotheses, analyse real experimental data, evaluate sources of uncertainty, and communicate evidence-based conclusions. The course emphasises the interconnected nature of STEM disciplines and mirrors the processes used by scientists and engineers in research and industry.

7.7N-B Learning Outcomes

At the completion of this unit, students will be expected to:

- Explain how light can be used to investigate physical chemical systems.
- Describe the principles of spectroscopy and its applications in science and technology.
- Understand how spectrometers acquire, process and display scientific data.
- Design and conduct experimental investigations using spectroscopic techniques.
- Communicate scientific findings using appropriate scientific conventions.
- Work collaboratively to solve experimental and engineering challenges.

7.7N-C Assessment

- Practical investigations and laboratory work, including scientific reporting
- Data analysis and interpretation tasks
- Research and scientific communication activities
- Experimental design challenges
- Student-directed inquiry project

This subject is recommended for students interested in chemistry, physics, engineering, astronomy, environmental science, data science and scientific research. It provides students with experience in authentic scientific investigation while developing the analytical and problem-solving skills required for future STEM study.

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OTHER AVAILABLE SUBJECTS



7.8 LANGUAGES

Overview

John Monash Science School offers two formal language options to Year 10 students. Students wishing to pursue a language as part of their regular Year 10 study may choose either French or Japanese.

Alongside the regular French and Japanese classroom activities and assessments, students are able to take part in state and national level competitions and tests for which they receive a certificate of participation.

The course is recommended for students who have complete Year 9 level of French / Japanese in their previous school.

A FRENCH

7.8A-A Curriculum Focus

In this course you will develop your speaking, listening, reading and writing skills in French to a standard which would allow progression into French VCE.

Whilst deepening your understanding of grammar and vocabulary, you will also be exposed to French and francophone culture through film, literature and music.

You will regularly use technology to improve your understanding and language production.

You will be expected to communicate in French at every opportunity in order to build confidence in your communication skills.

The course is recommended for students who have completed Year 9 level of French in their previous school.

There is also the opportunity to participate in external competitions and receive awards or certificates in events such as the Alliance Francaise de Melbourne, ACER Language Competence or even the DELF B1/B2.

If you are passionate about communication, interested in having a global perspective and hoping to increase your fluency in a second language to a high Year 10 standard, then French is a great option for you.

Study of Languages Other Than French or Japanese

Students wishing to study a language other than French or Japanese at John Monash Science School, may be able to access lessons in their desired language through the Victorian School of Languages program.

7.8A-B Learning Outcomes

The French curriculum aims to develop the knowledge, understanding and skills to ensure that students can communicate in French when they are learning; understand the relationship between language, culture and learning; develop inter-cultural capabilities; and understand themselves as communicators.

7.8A-C Assessment

Assessment of grammar, reading, listening, writing and speaking is through tests, culturally-focused research projects and semester exams.

B JAPANESE

7.8B-A Curriculum Focus

In this course you will develop your speaking, listening, reading and writing skills in Japanese to a standard which would allow progression into VCE Japanese.

Whilst deepening your understanding of grammar and vocabulary, you will also be exposed to Japanese-speaking cultures through film, comics, short stories and music.

You will regularly use technology to improve your understanding and language production.

You will be expected to communicate in Japanese at every opportunity in order to build confidence in your communication skills.

The course is recommended for students who have completed Year 9 level of Japanese in their previous school.

There are also opportunities to participate in external competitions and receive awards or certificates.

Assessment of grammar, reading, listening, writing and speaking is through tests, culturally-focused research projects and semester exams.

If you are passionate about culture and communication with a global perspective, then Yr 10 Japanese is the language for you.

7.8B-B Learning Outcomes

The Japanese curriculum aims to develop the knowledge, understanding and skills to ensure that students can communicate in Japanese when they are learning; understand the relationship between language, culture and learning; develop intercultural capabilities; and understand themselves as communicators.

7.8B-C Assessment

Students will complete a number of assessments in each semester.

Typically, the assessment items include:

- Writing assessment;
- Speaking / pronunciation assessment;
- Grammatical skills test; and,
- Investigation assignment.

7.9 MUSIC

Overview

Music Ensembles and Lessons are a thriving part of school life at JMSS. Students are able to take weekly lessons, play in school music groups, and perform at school events and competitions.

Students who already play an instrument are encouraged to continue their music at JMSS. Students interested in playing an instrument for the first time are encouraged to also take lessons.

A *Instrumental* MUSIC LESSONS

7.9A-A Available Instruments

John Monash Science School offers lessons in a wide variety of different instruments (see *Table of Available Instruments*). Instrument rental is available, and can be arranged through individual instrumental music teachers/instructors.

Table of Available Instruments

Woodwind	Brass	Strings
Flute	Trumpet	Violin
Clarinet	Trombone	Viola
Saxophone	Baritone	Cello
Double Bass	Euphonium	Tuba

Voice	Piano	Guitar
Classical	Classical	Classical
Jazz	Contemporary	Contemporary
Contemporary	Jazz	Bass Guitar
		Jazz

Percussion
Drum Kit
Percussion
Timpani
Mallet Percussion

7.9A-B Lesson Fees

Year 10 2026 – Voice & Instrumental Music (if applicable)

Costs listed are per/annum

Individual ½ Hour	$	999.00
Individual ¾ Hour	$	1,499.00
Individual Full Hour	$	1,999.00
Ensemble only	$	95.00

Fees are compulsory and become payable after enrolment is confirmed with the music department.

Lessons will not commence until a payment or payment plan is received. A one year commitment for lessons is expected.

Due to our staffing commitments, there is no refund for early withdrawal from lessons. Parents are responsible for all associated costs such as instrument hire, insurance, music books, consumables and examination fees.

Pair/group lessons can be arranged at the discretion of instrumental music teacher, based the number of applicants, schedule and skill levels. Fees per student will be proportionate to the group size (i.e., ½, ¾ …)



7.9A-C Lesson Timetabling

Lessons run during class time. Students are out of class for half a period per week. Instrumental music teachers will contact each student to discuss suitable schedules, taking into account clashes with excursions and off-site PE lessons. It is not possible to offer lessons at recess, lunch time, or after school, unless agreed upon by instrumental music teachers in charge. These times are generally reserved for our Year 12 and VCE Music Performance students.

Lesson times rotate throughout the term, so students do not miss the same class each week. Students are expected to catch up on any missed class work.

When an in-class assessment clashes with a music lesson, students must contact their teacher before the lesson.

7.9A-D Assessment and Exams

Students are assessed on performance pieces, studies, technical work and other assessment items. Students negotiate practice load, technical work and pieces they wish to study with their instrumental teacher. To satisfy the requirements of the course, students are expected to spend time practising/playing at home. Students are expected to come to lessons prepared to present their work and with all their equipment.

Students may choose to enrol in AMEB exams.
AMEB exams incur extra costs, including exam fees and accompanist fees.

Instrumental Music Program is linked to studying VCE Music Performance in Year 11 and 12. Students studying VCE Music must take Private Tuition.

7.9A-E Ensemble Participation

All students taking music lessons are required to participate in at least one ensemble, to attend weekly practices and perform each semester. Performing in groups is a core element of music study, one we consider essential.

Piano students are expected to attend choir, play percussion in Band or orchestra, or work with soloists as an accompanist.

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Instrumental Music: Enquiries and Assistance

Students and parents are asked to direct any enquiries about the Instrumental Music Program, including enquiries about financial assistance to:

Mr. Sean Smyth
sean.smyth@jmss.vic.edu.au

7.9 MUSIC

B *Music* ENSEMBLES

7.9B-A Ensemble Program

The ensemble program is a strength at JMSS and an essential part of any music education.

All students taking music lessons are required to participate in at least one ensemble, to attend weekly practices and perform each semester; however students are able to join ensembles independent of taking music lessons here at John Monash Science School.

John Monash Science School Music Ensembles include:

- Choirs
- Concert Band
- String Ensemble
- Flute Ensemble
- Saxophone Quartet
- Jazz Group
- Stage Band
- Orchestra
- Percussion Ensemble
- Brass and Wind Band
- Guitar Ensemble

John Monash Music ensembles perform regularly at school events and functions. They have featured in the NEVR Youth Concerts at Hamer Hall and the Melbourne Recital Centre. Students also work towards a large Mass Item performance each year at Presentation Evening, held at Robert Blackwood Hall.

7.9B-B Ensemble Rehearsals

Each ensemble has at least one session, either during lunchtime or before / after school. Schedules will be decided and communicated by the ensemble director within the first three weeks of the year.

7.9B-C Fees

For students who enrol in ensembles but not in instrumental music lessons, a small annual fee is applicable:

Ensemble Enrolment Fee	$	95.00

This fee covers resources, sheet music and time for ensemble leaders. Students participating in Instrumental Music Lessons are not required to pay this fee, as it is covered by their lesson fees for the year.

7.9B-D Music rehearsal schedule*

Time	Monday	Tuesday	Thursday
3.30pm-4.45pm	Concert Band	Orchestra	Stage Band & Choir

*Please note times and schedules are subject to change.

7.10 DUKE OF EDINBURGH AWARD

Duke of Edinburgh Award

About the Award

The Duke of Ed Award is a structured youth development program, empowering all young Australians to explore their full potential and find their purpose, passion and place in the world, regardless of their location or circumstance.

Accessing the Duke of Ed at JMSS

To earn an Award, each young person must learn a skill, improve their physical wellbeing, volunteer in their community and experience a team adventure in a new environment.

JMSS can facilitate this award through participation in the co-curricular program and other programs run at JMSS including World Challenge and the Reef and Rainforest Trip in Year 11.

Students register online and a JMSS staff member, Mr Whyte assists students to coordinate the award at the school.

Qualifying for the Duke of Ed

- The award is open to all young people aged 14 to 24

- The award can be done at 3 levels: Bronze, Silver and Gold - each level is progressively more challenging.

- The award has 4 sections: Physical Recreation, Skills, Voluntary Service, Adventurous Journey plus Residential Project (Gold Level only)

- The young person completing the award recognises and individually organises each of the 4 sections. They must also collect evidence to support completion of each of theses sections (via an online record book)

- There are time requirements associated with each level of the award.

- Bronze - minimum 6 months
- Silver - minimum 6 months if completed Bronze, otherwise 12 months for direct entrants
- Gold - minimum 12 months if completed Silver otherwise 18 months for direct entrants

Further information about the Duke of Edinburgh award can be obtained from Mr Whyte at school.

Email address Greg Whyte at - greg.whyte@jmss.vic.edu.au

THE DUKE OF EDINBURGH'S INTERNATIONAL AWARD AUSTRALIA

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Section Seven:

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CO-CURRICULAR PROGRAM



7.11 CO-CURRICULAR PROGRAM

Overview

At JMSS we aim to prepare our students with life skills so that they are equipped for their future, both personally and professionally.

The JMSS Co-Curricular Program is an important part of the overall education at JMSS, providing activities that complement and supplement the entire learning process and effectively impact student learning outcomes. The holistic growth of our students is important to the ethos of our school. The personal development of our students is promoted through the Co-Curricular activities.

The broad spectrum of Co-Curricular activities that are offered aim to affect all domains of life such as cognitive (intellectual), emotional, social, moral, cultural and aesthetic.

For example, outreach programs with local primary schools like Little Scientists & Mini Mathematician develop leadership skills and allow students to engage positively with the community.

We hope that our JMSS Co-Curricular program will strengthen the classroom learning as well as learning outside the classroom to develop the personality of the student.

A *Program* STRUCTURE

7.11A-A Timetabling and Structure

The Co-Curricular Program runs between 1:40pm and 3:30 pm every Wednesday afternoon.

The activities that are offered aim to develop skills and attributes that are cognizant with the attributes of the UNESCO Four Pillars of Learning.

Each Wednesday, students complete 2 rotations of activities/ subjects and are exposed of up to 6 activities/ subjects across the year. The program runs from the second school week of the year to early Term 4. A co-curricular trimester runs for a 8 week block.

B *Subjects*

Subjects for 2027 are yet to be finalised. The following table shows the subjects conducted in 2026 and how they align with the UNESCO Four Pillars of Learning.

There will be some changes to subjects on offer in 2027.

Students will be emailed descriptions of the 2027 subjects and are expected to complete their co-curricular web preferences before course counselling.

7.11 T1

Co-Curricular
SUBJECTS AND UNESCO CLASSIFICATIONS

Table of Co-Curricular Subjects

UNESCO Classification	Examples of subjects
Learning to Know FOCUSED ON THINKING AND UNDERSTANDING - Our learners are effective inquirers, able to ask meaningful questions which probe understanding, and take risks in their learning. - Our learners are critical thinkers, able to analyse information, evaluate evidence and produce informed conclusions. - Our learners are creative thinkers, open to new ideas, imaginative and resourceful in their use of different strategies and approaches. - Our learners are reflective, aware of their own skills and abilities, and open to feedback to improve their own ideas or performance.	Brain Bee Cells to Systems Reading
Learning to Be FOCUSED ON DEVELOPING GOOD PEOPLE - Our learners are well-rounded with a broad range of skills, perspectives and interests. - Our learners are passionate about learning and strive to achieve their personal best in everything they do. - Our learners are able to examine issues from a wide range of perspectives, and understand the need to act honestly and ethically when making decisions. Our learners develop the dimensions of leadership, within a context of service to and beyond the JMSS community.	Debating Leadership Knitting and Philosophy
Learning to Do FOCUSED ON KNOWLEDGE AND SKILL ACQUISITION - Our learners are adaptable, being able to live effectively with change, skilled in the use of modern technologies, and prepared to meet any challenge with optimism - Our learners are effective communicators, being attentive listeners and also articulate in both written and spoken media. - Our learners are persistent, being able to work effectively through difficulties, and resilient in the face of set-backs. - Our learners are develop the competencies necessary to advance their learning in specific disciplines, and are responsible for their own learning.	Lego Robotics Sport Drawing and Painting
Learning to Live Together FOCUSED ON BUILDING SOUND RELATIONSHIPS - Our learners build effective collaboration and teamwork by working constructively together, considering the valuing all input and viewpoints fairly. - Our learners build positive, respectful and supportive relationships with all community members, and celebrate diversity. - Our learners contribute to the creation of a safe, welcoming, optimistic and encouraging learning environment and community. - Our leaders have a global perspective, know and care about the world and its communities, and seek to live sustainably and impact positively now and in the future.	Yearbook Little Scientists, Big Science Mini Mathematicians

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Section Eight:
CURRICULUM PATHWAYS



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Section Eight: CURRICULUM PATHWAYS

8.1 *Curriculum* PATHWAYS

8.1A What is a Curriculum Pathway?

A 'Curriculum Pathway' (sometimes simplified to 'pathway') is a combination of subjects which can be taken at John Monash Science School and which provide the pre-requisites for various tertiary courses at university as well as conforming to the requirements of the VCE (Victorian Certificate of Education).

Each 'pathway' in the following section is a partial package, which may be useful to you in constructing your own individual course through the VCE program.

You do not have to follow any of these pathways.
You are free to choose any combination of units you like.

Planning for what you want to do after VCE can no longer be left until the end of Year 12. Students and parents should be considering options in the early stages of constructing the individual student's program.

8.1B Why might you use a Curriculum Pathway?

Curriculum Pathways can be used:

- To provide coherence in your program of studies;
- To provide purpose and direction to your program of studies; and,
- To give a clear career focus to your VCE and beyond.

8.1C VCE Requirements

VCE stands for the Victorian Certificate of Education. The VCE is a two-year course (minimum) administered by the Victorian Curriculum Assessment Authority (VCAA). Over the length of this course, most VCE full-time students will undertake a total of 22 to 24 semester-length units.

8.1D VCE Graduation Requirements

Your VCE Program is the complete list of VCE units you complete. To meet the graduation requirements of the VCE, each student must satisfactorily complete a total of no fewer than 16 units. A unit is one semester in duration. There are 2 semesters per school year.

These units must include:

- At least three units of the common study of English (Units 1, 2, 3 and 4);
- or English as an Alternative Language (Units 1, 2, 3 and 4); and,
- three sequences of Units 3 and 4 studies other than English.

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Example Pathways and Pathway Templates

The following pages contain some example pathways and pathway templates, which you can use to help you decide your own pathway for VCE.

Full-time students will undertake a total of 22 to 24 semester-length units.

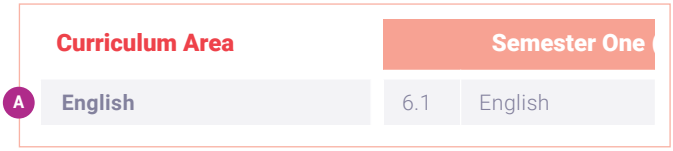
8.2 *How To Use* EXAMPLE PATHWAYS

To use the Example Curriculum Pathways provided in this section of the handbook, students should work down and across, beginning on the left-hand side of the page, filling in the empty 'Choice Boxes', beginning with Year One, and progressing through Year Two and Year Three, observing the following items:

1

A Required/Compulsory Subjects

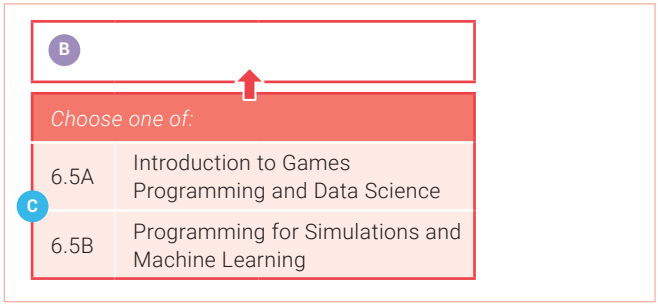
Subjects represented like this are usually taken by all students at Year 10 level, and do not offer a choice within the pathway.



2

B Choice Boxes

These empty boxes indicate space for a subject choice to be made. The recommended or available options are provided in a list below the box.



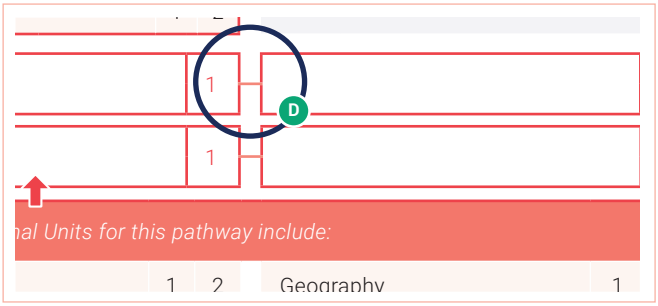
3

C Option Lists

Where a subject selection needs to be made, lists of the recommended options for the given pathway are provided.

These are suggestions that will help students develop and build the skills they need for further study and/or a career in the field/area of interest represented by the overall pathway (Biomedical Sciences, Physical Sciences, etc.)

Students may choose to deviate from the suggested options.



4

D VCE Unit Connection Lines

At VCE Level, subjects are taken in 'units' – usually one unit per semester.

Making a subject choice in Years 2 or 3 of the pathway, usually means taking either Units 1 and 2, or Units 3 and 4 of a particular subject. In order to take Units 3 and 4 of a particular subject in Year 3, it is usually a requirement that students will have completed Units 1 and 2 in the previous year.

Restriction of Choices in Year Three

Due to the continuous nature of study across Years Two and Three, subject choices made in Year Two (Units 1 and 2) are likely to carry through into Year Three (Units 3 and 4) to help fulfil the requirements from VCE.

Pathways are intended to assist students in connecting their studies across their three years at John Monash Science School to allow them to pursue their desired further studies and careers.

8.2 E1

Example Pathway: BIOLOGICAL AND BIOMEDICAL SCIENCE

This is an ***example study pathway*** that students wishing to pursue further study or employment in the field of **Biological and Biomedical Sciences** may like to consider.

This pathway can lead to tertiary courses in:

- Chemistry
- Climate Science
- Engineering
- Environmental Management
- Exercise and Sports
- Forestry
- Formulation Science
- Geoscience
- Medicine
- Medical imaging
- Mathematics
- Nanotechnology
- Pharmaceutical Science
- Physics
- Prosthetics
- Science

Example Careers

- Cosmetic Scientist
- Biotechnologist
- Medicinal Chemist
- Drug Discovery Scientist
- Regulator
- Educator
- Environmental Chemist
- Exercise and Sports Scientist
- Marine Biologist
- Artificial Intelligence
- Food Scientist
- Biomedical Engineer
- Geneticist
- Forensic scientist.
- Marine Biologist
- Nanotechnologist.
- Pharmacologist
- Physiotherapist
- Prosthetic Scientist

Year One

	Curriculum Area	Semester One (S1)		Semester Two (S2)
R	English	7.1	English	English
	Mathematics	7.3A	Core Mathematics	Core Mathematics
	Science	7.4	Core Science	Core Science
	Issues Studies	7.2	Issues Studies	Issues Studies
	Physical Education or LOTE Students may take *either* Physical Education *or* French *or* Japanese.	*Choose one of:*		
		7.6	Physical Education	
		7.8A	French	
		7.8B	Japanese	
Ds	**Data Science** Students must complete *one semester* of Data Science at Year 10 Level			*Choose one of:*
				7.5A Introduction to Games Programming
				7.5B Intro to Programming, Machine Learning and Simulations
E	**Enrichment STEM Electives** Students must complete three Enrichment STEM Electives at Year 10 Level, with a maximum of two (2) to be taken in a single semester.	*Suggested Enrichment STEM Electives:*		*Any other Enrichment STEM Elective*
		7.7B	Aquatic Fieldwork Science	Refer to ***7.2-T1 - Curriculum Structure***
		7.7D	Biotechnology	
		7.7H	Microbiology	
		7.7J	Disease, Disorders & Scientific Discoveries	

Year Two

Curriculum Area	Semester One (S1)	Semester Two (S2)
English	1	2
	Choose one of:	
	VCE English Literature 1 2	
	VCE English Language 1 2	
	English as Additional Language 1 2	
Mathematics	VCE Mathematical Methods 1	VCE Mathematical Methods 2
Science	VCE Chemistry 1	VCE Chemistry 2
	1	2
	Suggested Additional VCE Science:	
	VCE Biology 1 2	
	VCE Physics 1 2	
Additional Unit(s)	1	2
	1	2

Additional Units

Select units which best complement your intended career options and which meet the pre-requisites/ recommendations for your intended course.

Suggested Additional Units for this pathway include:

Psychology	1	2	Geography	1	2
LOTE	1	2	Specialist Mathematics	1	2
Environmental Science	1	2	Music Performance	1	2
Physical Education	1	2			

Year Three

Curriculum Area	Semester One (S1)	Semester Two (S2)
English	*Continue with one of:*	*(Based on choice in Year 2)*
	VCE English Literature 3	VCE English Literature 4
	VCE English Language 3	VCE English Language 4
	English as Additional Language 3	English as Additional Language 4
Mathematics	VCE Mathematical Methods 3	VCE Mathematical Methods 4
Science	VCE Chemistry 3	VCE Chemistry 4
	Continue with one of:	*(Based on choice in Year 2)*
	VCE Biology 3	VCE Biology 4
	VCE Physics 3	VCE Physics 4

8.2 E2

Example Pathway: PHYSICAL SCIENCES

This is an ***example study pathway*** that students wishing to pursue further study or employment in the field of **Physical Sciences** may like to consider.

This pathway can lead to tertiary courses in:

- Aeronautical Engineering
- Atmospheric Physics
- Biomedical Engineering
- Chemistry
- Climate Science
- Cosmology
- Engineering
- Forestry
- Geoscience
- Medicine
- Medical Imaging
- Mathematics
- Mining Engineering
- Nanotechnology
- Physics

Example Careers

- Animal Scientist/ Researcher
- Animal Management
- Biomedical Engineer
- Ecotourism operator
- Exercise & Sports Scientist
- Physiologist
- Marine Ecologist
- Health Science Practitioner
- Medical Device Manufacturer
- Medical Researcher
- Occupational Therapist
- Physiotherapist
- Scientist
- Conservationist
- Wildlife Manager
- Zoologist

Year One

	Curriculum Area	Semester One (S1)		Semester Two (S2)
R	English	7.1	English	English
	Mathematics	7.3A	Core Mathematics	Core Mathematics
	Science	7.4	Core Science	Core Science
	Issues Studies	7.2	Issues Studies	Issues Studies
	Physical Education or LOTE Students may take *either* Physical Education *or* French *or* Japanese.	*Choose one of:*		
		7.6	Physical Education	
		7.8A	French	
		7.8B	Japanese	
Ds	**Data Science** Students must complete *one semester* of Data Science at Year 10 Level	*Choose one of:*		
		7.5A	Introduction to Games Programming	
		7.5B	Intro to Programming, Machine Learning and Simulations	
E	**Enrichment STEM Electives** Students must complete three Enrichment STEM Electives at Year 10 Level, with a maximum of two (2) to be taken in a single semester.	*Suggested Enrichment STEM Electives:*		*Suggested Enrichment STEM Electives:*
		7.7A	Analytical Spectroscopy	7.7G Medical Physics
		7.7C	Astrophysics	7.7I Nature & Beauty of Mathematics
		7.7F	Tiny Village Design	
				Any other Enrichment STEM Elective
				Refer to ***7.2-T1 - Curriculum Structure***

Year Two

Curriculum Area	Semester One (S1)		Semester Two (S2)	
		1		2
English	*Choose one of:*			
	VCE English Literature	1 2		
	VCE English Language	1 2		
	English as Additional Language	1 2		
Mathematics	VCE Mathematical Methods	1	VCE Mathematical Methods	2
	VCE Specialist Mathematics	1	VCE Specialist Mathematics	2
Science	VCE Physics	1	VCE Physics	2
	VCE Chemistry	1	VCE Chemistry	2
Additional Unit(s)		1		2
	Suggested Additional Units for this pathway include:			
	LOTE	1 2	History	1 2
	Biology	1 2	Geography	1 2

Additional Units

Select units which best complement your intended career options and which meet the pre-requisites/ recommendations for your intended course.

Year Three

Curriculum Area	Semester One (S1)		Semester Two (S2)	
English	*Continue with one of:*		*(Based on choice in Year 2)*	
	VCE English Literature	3	VCE English Literature	4
	VCE English Language	3	VCE English Language	4
	English as Additional Language	3	English as Additional Language	4
Mathematics	VCE Mathematical Methods	3	VCE Mathematical Methods	4
	VCE Specialist Mathematics	3	VCE Specialist Mathematics	4
Science	VCE Physics	3	VCE Physics	4
	VCE Chemistry	3	VCE Chemistry	4

8.2 E3

Example Pathway: CHEMICAL SCIENCES

This is an ***example study pathway*** that students wishing to pursue further study or employment in the field of **Chemical Sciences** may like to consider.

This pathway can lead to tertiary courses in:

- Chemistry
- Climate Science
- Engineering
- Environmental Management
- Exercise and Sports
- Forestry
- Formulation Science
- Geoscience
- Medicine
- Medical imaging
- Mathematics
- Nanotechnology
- Pharmaceutical Science
- Physics
- Prosthetics
- Science

Example Careers

- Cosmetic Scientist
- Biotechnologist
- Medicinal Chemist
- Drug Discovery Scientist
- Regulator
- Educator
- Environmental Chemist
- Exercise and Sports Scientist
- Marine Biologist
- Food Scientist
- Biomedical Engineer
- Geneticist
- Forensic scientist.
- Marine Biologist
- Nanotechnologist.
- Pharmacologist
- Physiotherapist
- Prosthetic Scientist

Year One

	Curriculum Area	Semester One (S1)		Semester Two (S2)
R	English	7.1	English	English
	Mathematics	7.3A	Core Mathematics	Core Mathematics
	Science	7.4	Core Science	Core Science
	Issues Studies	7.2	Issues Studies	Issues Studies
	Physical Education or LOTE Students may take *either* Physical Education *or* French *or* Japanese.	*Choose one of:*		
		7.6	Physical Education	
		7.8A	French	
		7.8B	Japanese	
Ds	**Data Science** Students must complete *one semester* of Data Science at Year 10 Level	*Choose one of:*		
		7.5A	Introduction to Games Programming	
		7.5B	Into to Programming , Machine Learning and Simulations	
E	**Enrichment STEM Electives** Students must complete three Enrichment STEM Electives at Year 10 Level, with a maximum of two (2) to be taken in a single semester.	*Suggested Enrichment STEM Electives:*		*Suggested Enrichment STEM Electives:*
		7.7A	Analytical Spectroscopy	7.7D Biotechnology
		7.7K	Pharmaceutical Science	7.7F Tiny Village Design
				7.7E Materials Science & Engineering
				Any other Enrichment STEM Elective
				Refer to ***7.2-T1 - Curriculum Structure***

Year Two

Curriculum Area	Semester One (S1)	Semester Two (S2)GEO
English	1	2
	Choose one of:	
	VCE English Literature 1 2	
	VCE English Language 1 2	
	English as Additional Language 1 2	
Mathematics	VCE Mathematical Methods 1	VCE Mathematical Methods 2
Science	VCE Chemistry 1	VCE Chemistry 2
	1	2
	Suggested Additional VCE Science:	
	VCE Biology 1 2	
	VCE Physics 1 2	
Additional Unit(s)	1	2
	1	2

Additional Units

Select units which best complement your intended career options and which meet the pre-requisites/ recommendations for your intended course.

Suggested Additional Units for this pathway include:

LOTE	1	2	Specialist Mathematics	1	2
Geography	1	2	Environmental Science	1	2
Psychology	1	2	History	1	2

Year Three

Curriculum Area	Semester One (S1)	Semester Two (S2)
English	***Continue with one of:***	*(Based on choice in Year 2)*
	VCE English Literature 3	VCE English Literature 4
	VCE English Language 3	VCE English Language 4
	English as Additional Language 3	English as Additional Language 4
Mathematics	VCE Mathematical Methods 3	VCE Mathematical Methods 4
Science	VCE Chemistry 3	VCE Chemistry 4
	Continue with one of:	*(Based on choice in Year 2)*
	VCE Biology 3	VCE Biology 4
	VCE Physics 3	VCE Physics 4

8.2 E4

Example Pathway: ENVIRONMENTAL SCIENCE

This is an ***example study pathway*** that students wishing to pursue further study or employment in the field of **Environmental Science** may like to consider.

This pathway can lead to tertiary courses in:

- Agribusiness
- Chemistry
- Climate Science
- Conservation and Sustainability
- Education
- Engineering
- Environmental Sciences
- Environmental Management
- Environmental Engineering
- Forestry
- Geomatics
- GIS
- Mathematics
- Science
- Urban Planning

Example Careers

- Educator
- Environmental Scientist
- Environmental Engineer
- Geologist
- Urban Planner
- Conservation Consultant
- Marine Biologist
- Sustainability Consultant
- Landscape Architect
- Town planner
- Toxicologist
- Transport planner
- Biomedical Engineer

Year One

	Curriculum Area	Semester One (S1)		Semester Two (S2)
R	English	7.1	English	English
	Mathematics	7.3A	Core Mathematics	Core Mathematics
	Science	7.4	Core Science	Core Science
	Issues Studies	7.2	Issues Studies	Issues Studies
	Physical Education or LOTE Students may take *either* Physical Education *or* French *or* Japanese.	*Choose one of:*		
		7.6	Physical Education	
		7.8A	French	
		7.8B	Japanese	
Ds	**Data Science** Students must complete *one semester* of Data Science at Year 10 Level			*Choose one of:*
				7.5A Introduction to Games Programming
				7.5B Intro to Programming, Machine Learning and Simulations
E	**Enrichment STEM Electives** Students must complete three Enrichment STEM Electives at Year 10 Level, with a maximum of two (2) to be taken in a single semester.	7.7J		
		Suggested Enrichment STEM Electives:		*Any other Enrichment STEM Elective*
		7.7B	Aquatic Fieldwork Science	Refer to ***7.2-T1 - Curriculum Structure***
		7.7L	Terraforming Mars	

Year Two

Curriculum Area	Semester One (S1)		Semester Two (S2)	
English	*Choose one of:*			
	VCE English Literature	1 2		
	VCE English Language	1 2		
	English as Additional Language	1 2		
Mathematics	VCE Mathematical Methods	1	VCE Mathematical Methods	2
Science	VCE Chemistry	1	VCE Chemistry	2
	VCE Biology	1	VCE Biology	2
	VCE Environmental Science	1	VCE Environmental Science	2
Additional Unit(s)		1		2

Additional Units

Select units which best complement your intended career options and which meet the pre-requisites/ recommendations for your intended course.

Suggested Additional Units for this pathway include:					
LOTE	1	2	Psychology	1	2
Physics	1	2	History	1	2
Economics	1	2			

Year Three

Curriculum Area	Semester One (S1)		Semester Two (S2)	
English	*Continue with one of:*		*(Based on choice in Year 2)*	
	VCE English Literature	3	VCE English Literature	4
	VCE English Language	3	VCE English Language	4
	English as Additional Language	3	English as Additional Language	4
Mathematics	VCE Mathematical Methods	3	VCE Mathematical Methods	4
Science	VCE Chemistry	3	VCE Chemistry	4
	VCE Biology	3	VCE Biology	4
	VCE Environmental Science	3	VCE Environmental Science	4

8.2 E5

Example Pathway: COMPUTER SCIENCES/ENGINEERING

This is an ***example study pathway*** that students wishing to pursue further study or employment in the field of **Computer Sciences** may like to consider.

This pathway can lead to tertiary courses in:

- Architecture
- Aeronautical Engineering
- Artificial Intelligence
- Atmospheric Physics
- Biomedical Engineering
- Climate Science
- Computer Science
- Cosmology
- Data Science
- Engineering
- Geoscience
- GIS
- Material Science
- Mathematical Science
- Mechatronics
- Nanotechnology
- Physics
- Science
- Surveying
- Robotics

Example Careers

- Architect
- Educator
- Engineer
- Actuary
- Computer Modeller
- Future Analyst
- Software Developer
- Database Administrator
- Cyber Security
- Hacker
- Computer Systems Engineer
- Computer Systems Analyst
- Computer Network Architect
- Web Developer
- Information Security Analysts
- Computer Programmer
- Artificial Intelligence

Year One

	Curriculum Area	Semester One (S1)		Semester Two (S2)
R	English	7.1	English	English
	Mathematics	7.3A	Core Mathematics	Core Mathematics
	Science	7.4	Core Science	Core Science
	Issues Studies	7.2	Issues Studies	Issues Studies
	Physical Education or LOTE Students may take *either* Physical Education *or* French *or* Japanese.	*Choose one of:*		
		7.6	Physical Education	
		7.8A	French	
		7.8B	Japanese	
Ds	**Data Science** Students must complete *one semester* of Data Science at Year 10 Level	7.5A	**Introduction to Games Programming and Data Science**	
E	**Enrichment STEM Electives** Students must complete three Enrichment STEM Electives at Year 10 Level, with a maximum of two (2) to be taken in a single semester.	*Suggested Enrichment STEM Electives:*		*Suggested Enrichment STEM Electives:*
		7.7E	Materials Science & Engineering	7.5B Intro for Programming, Machine Learning and Simulations
		7.7I	Nature & Beauty of Mathematics	7.5A Intro to Games Programming
				Any other Enrichment STEM Elective
				Refer to ***7.7-T1 - Curriculum Structure***

Year Two

Curriculum Area	Semester One (S1)		Semester Two (S2)	
English		1		2
	Choose one of:			
	VCE English Literature	1 2		
	VCE English Language	1 2		
	English as Additional Language	1 2		
Mathematics	VCE Mathematical Methods	1	VCE Mathematical Methods	2
Science	VCE Chemistry	1	VCE Chemistry	2
		1		2
	Suggested Additional VCE Science:			
	VCE Biology	1 2		
	VCE Physics	1 2		
Additional Unit(s)	VCE Computing	1	VCE Computing	2
		1		2
	Suggested Additional Units for this pathway include:			
	LOTE	1 2	Geography	1 2
	Biology	1 2	Environmental Science	1 2
	Economics	1 2	History	1 2

Additional Units

Select units which best complement your intended career options and which meet the pre-requisites/ recommendations for your intended course.

Year Three

Curriculum Area	Semester One (S1)		Semester Two (S2)	
English	*Continue with one of:*		*(Based on choice in Year 2)*	
	VCE English Literature	3	VCE English Literature	4
	VCE English Language	3	VCE English Language	4
	English as Additional Language	3	English as Additional Language	4
Mathematics	VCE Mathematical Methods	3	VCE Mathematical Methods	4
Algorithmics	VCE Algorithmics	3	VCE Algorithmics	4
Science	*Continue with one of:*		*(Based on choice in Year 2)*	
	VCE Biology	3	VCE Biology	4
	VCE Physics	3	VCE Physics	4

8.2 E6

Example Pathway: ACCELERATED LEARNING

This is an ***example study pathway*** that students wishing to **accelerate their pattern of study** may like to consider. Accelerated pathways require students to complete two VCE units in Year One, allowing a full VCE subject (Units 1-4) to be completed by the end of Year 2. This creates an open line within the program of study, which can be filled by University Extension Subjects.

Accelerated Pathways are available in:

- Biology
- Humanities
- LOTE
- Mathematics
- Physics
- Computing

University Extension is available in:

- Biology
- Climate Science
- Chemistry
- History and Philosophy of Science
- Physics
- Mathematics

Year One

	Curriculum Area	Semester One (S1)	Semester Two (S2)
R	English	7.1 English	English
	Mathematics	VCE Mathematical Methods 1	VCE Mathematical Methods 2
	Science	7.4 Core Science	Core Science
	Issues Studies	7.2 Issues Studies	Issues Studies
	Physical Education or LOTE Students may take *either* Physical Education *or* French *or* Japanese.	*Choose one of:* 7.6 Physical Education 7.8A French 7.8B Japanese	
Ds	**Data Science** Students must complete *one semester* of Data Science at Year 10 Level		*Choose one of:* 7.5A Introduction to Games Programming 7.5B Intro to Programming, Machine Learning and Simulations
E	**Enrichment STEM Electives** Students must complete three Enrichment STEM Electives at Year 10 Level, with a maximum of two (2) to be taken in a single semester.	*Enrichment STEM Electives (x2)* Refer to ***7.7-T1 - Curriculum Structure***	*Enrichment STEM Elective* Refer to ***7.7-T1 - Curriculum Structure***

Year Two

Curriculum Area	Semester One (S1)	Semester Two (S2)
English	1	2
	Choose one of:	
	VCE English Literature 1 2	
	VCE English Language 1 2	
	English as Additional Language 1 2	
Mathematics	VCE Mathematical Methods 3	VCE Mathematical Methods 4
Science	1	2
	VCE Science:	
	VCE Biology 1 2	
	VCE Chemistry 1 2	
	VCE Physics 1 2	
	VCE Psychology 1 2	
	VCE Environmental Science 1 2	
Additional Unit(s)	1	2
	1	2
	1	2

Additional Units

Select units which best complement your intended career options and which meet the pre-requisites/ recommendations for your intended course.

Year Three

Curriculum Area	Semester One (S1)	Semester Two (S2)
English	*Continue with one of:*	*(Based on choice in Year 2)*
	VCE English Literature 3	VCE English Literature 4
	VCE English Language 3	VCE English Language 4
	English as Additional Language 3	English as Additional Language 4
University Extension Subjects		
Algorithmics	VCE Algorithmics 3	VCE Algorithmics 4
Science	*Continue with VCE Science*	*(Based on choice in Year 2)*
Additional Unit(s)	3	4
	3	4

8.2 P1

Pathways Template: YOUR OWN PATHWAY – A

This template is intended to help students ***map their study pathway*** across the three years of study at John Monash Science School.

Year One

	Semester One (S1)	Semester Two (S2)
English	7.1 English	English
Mathematics	7.3A Core Mathematics	Core Mathematics
Science	7.4 Core Science	Core Science
Issues Studies	7.2 Issues Studies	Issues Studies
Physical Education or LOTE		
Data Science		
Enrichment STEM Electives		

Subject Selection Guidelines

Physical Education or LOTE

Students may take *either* Physical Education *or* French *or* Japanese.

Data Science

Students must complete one semester of Data Science at Year 10 Level.

Enrichment STEM Electives

Students must complete three Enrichment STEM Electives at Year 10 Level, with a maximum of two (2) to be taken in a single semester.

Additional Guidelines for selection of Enrichment STEM Electives can be found in ***Table 7.7-T1 Subject Selection: STEM Elective Subjects*** on page **62.**

Year Two

	Semester One (S1)		Semester Two (S2)	
English		1		2
Mathematics		1		2
Science		1		2
		1		2
Additional Units		1		2
		1		2

Year Three

	Semester One (S1)		Semester Two (S2)	
English		3		4
Mathematics		3		4
Science		3		4
		3		4
Additional Units		3		4

8.2 P2

Pathways Template: YOUR OWN PATHWAY – B

This template is intended to help students ***map their study pathway*** across the three years of study at John Monash Science School.

Year One

	Semester One (S1)		Semester Two (S2)
English	7.1	English	English
Mathematics	7.3A	Core Mathematics	Core Mathematics
Science	7.4	Core Science	Core Science
Issues Studies	7.2	Issues Studies	Issues Studies
Physical Education or LOTE			
Data Science			
Enrichment STEM Electives			

Subject Selection Guidelines

Physical Education or LOTE

Students may take *either* Physical Education *or* French *or* Japanese.

Data Science

Students must complete one semester of Data Science at Year 10 Level.

Enrichment STEM Electives

Students must complete three Enrichment STEM Electives at Year 10 Level, with a maximum of two (2) to be taken in a single semester.

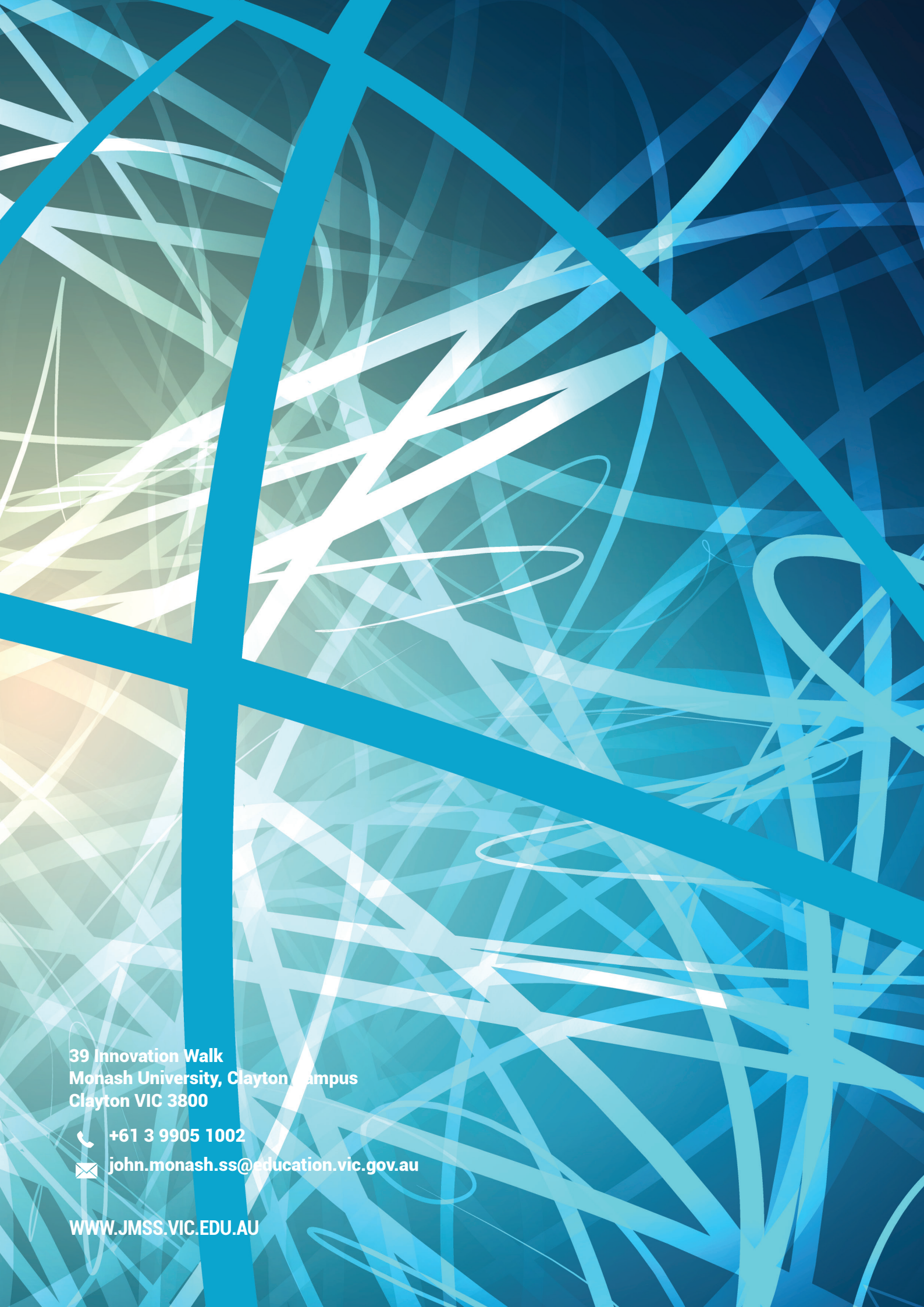
Additional Guidelines for selection of Enrichment STEM Electives can be found in ***Table 7.7-T1 Subject Selection: STEM Elective Subjects*** on page **62.**

Year Two

	Semester One (S1)		Semester Two (S2)	
English		1		2
Mathematics		1		2
Science		1		2
		1		2
Additional Units		1		2
		1		2

Year Three

	Semester One (S1)		Semester Two (S2)	
English		3		4
Mathematics		3		4
Science		3		4
		3		4
Additional Units		3		4



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