Years 9 STEM Futures Electives & Year 10 Diploma Preparation Program Handbook 2026

Inspiring Great Minds

Queensland Academy for Science Mathematics and Technology

Queensland Government

Contents

Introduction

Students will soon be commencing the next phase of their learning as they move into the Year 9 – 10 program of study, known as our Diploma Preparation Program. As a part of this program, in additional to core curriculum studies, Year 9 students are given the opportunity study two STEM Elective subjects. This handbook is designed to support students and parents in selecting subjects for Diploma Preparation program of study. We encourage you to review the contents of this handbook to learn about our Diploma Preparation Program and its importance in supporting students' transition from the IB Middle Years Programme to the IB Diploma Programme.

To help families make Year 9 STEM Futures elective subject selections, this booklet provides an overview of the curriculum as one of a number of strategies to ensure that students make informed choices in preparation to study the Diploma Programme. While the Academy aims to offer all Year 9 STEM Futures elective subjects listed in this booklet, it is important to note that this will be dependent on class numbers and the Academy's staffing capacity. Some subjects may not be able to be offered if minimum numbers are not met.

Year 9 students are required to complete their STEM Futures elective subject selection online. Details for completing the online subject selection will be communicated, including dates for completion. The subjects available for selection are listed in this booklet. The checklist on the subject selection page should be used as a guide to deciding STEM Futures elective subject selections.

If a student wishes to discuss their chosen subjects or invited levels, they should first meet with their House Dean or the curriculum Head of Department.

We wish our families and students the very best as they enter this next exciting phase of their learning journey at QASMT.

Our Mission and Values

Our Vision

Inspiring great minds through the provision of a world-class education that nurtures personal excellence and develops young people who are able to contribute positively to an ever-changing world.

Our Values

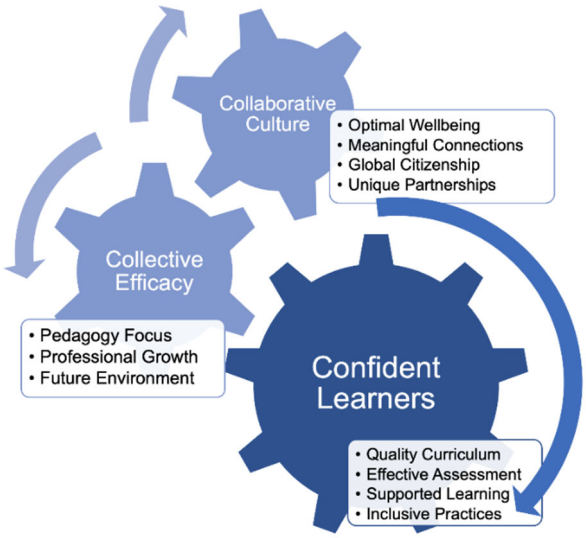
We value the ten aspirational qualities of the International Baccalaureate (IB) Learner Profile, which go beyond academic success to instil a sense of personal excellence, striving to improve in every aspect of our lives. The aim is not perfection but instead to achieve our potential; and flourishing as defined in positive psychology.

Inquirers	Open-minded
Knowledgeable	Caring
Thinkers	Risk-takers
Communicators	Balanced
Principled	Reflective

Our Mission

To achieve the IB aims of developing inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. Through the IB, we develop challenging programmes of international education and rigorous assessment. These programmes encourage our students to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right.

(Adapted from the IB Mission Statement)



Overview of QASMT Curriculum Programs

The Year 7 – 12 curriculum framework at QASMT has been specifically developed to provide a STEM focussed curriculum, through the International Baccalaureate (IB) Middle Years Programme (MYP), Diploma Preparation Program (DPP) and Diploma Programme (DP).

Year 7 – 8 Foundation Program

A rigorous and accelerated curriculum program developed through the IB Middle Years Programme, Year 3 standards, and mapped to the Australian Curriculum as relevant. The program is delivered through six full year courses and two semester courses across the eight MYP subject groups. Students choose their Language Acquisition and Arts courses.

Year 9 – 10 Diploma Preparation Program

The Diploma Preparation Program is studied in Years 9 and 10. The Diploma Preparation Program provides students with a transition between the IB Middle Years Programme and IB Diploma Programme. This two-phase program is developed through the core curriculum priorities of Language and Literature, Mathematics, Science, Individuals and Societies and Language Acquisition, and two STEM Futures elective subjects offered in Year 9. All Year 9 core subjects are mapped to the Australian Curriculum through to and including Australian Curriculum Year 10 requirements. Therefore, in addition Year 9 students are able to select their choice of two (2) STEM Futures elective subjects.

A STEM education is an approach to learning where rigorous academic concepts are coupled with real-world lessons as students apply science, technology, engineering, or mathematics in contexts that make connections between school, community, work, and the global enterprise, enabling the development of STEM literacy and with it the ability to compete in the new economy (adapted from Tsupros, 2009).

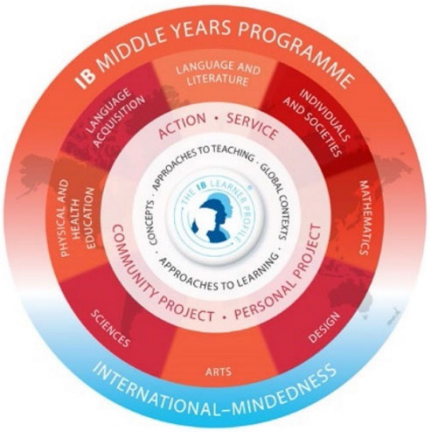
STEM Futures elective subjects deliver a future-focussed STEM curriculum that engages passionate, innovative learners capable of creating positive and sustainable change in the world. Our STEM Futures Electives have been written in collaboration with university/industry links to provide a challenging and engaging curriculum designed to enhance students' knowledge, understanding and skills in STEM and global citizenship. Our collaborators so far include, The University of Queensland, Queensland University of Technology, Moreton Bay Environmental Education Centre, Queensland Virtual STEM Academy and SPARQ-ed; we are continuing to expand our collaborations as we develop this new and exciting curriculum.

The Year 10 program is a bespoke program developed to prepare students for the rigours of the IB Diploma Programme. Each course has been designed to ensure skill development in preparation for the disciplines chosen by students to study in their Diploma in Year 11 and 12. Students and families will be provided with

further information on the Year 10 courses during Year 9, but it is essential that all students are placed in their correct subjects as early as possible in Years 9 and 10, in order to best prepare them for their DP subjects.

Year 11 – 12 Diploma Program

The IB Diploma Programme is a rigorous, university preparation curriculum program. The programme is studied across six subject areas, either one subject in each subject group (Groups 1-5) or two subjects in either Sciences or Individuals and Societies. All students study three subjects at Standard Level, three subjects at Higher Level subjects and the inner core subjects, Theory of Knowledge, Extended Essay and CAS (Creativity, Activity and Service). Students and their families will be provided with more information on the DP courses and assessments within these courses as they enter Year 10.



The IB Learner Profile

The aim of all IB programmes is develop international mindedness in students who, recognising their common humanity and shared guardianship of the planet help to create a better and more peaceful world. IB learners strive to be:

Inquirers	They nurture their curiosity, developing skills for inquiry and research. They know how to learn independently and with others. They learn with enthusiasm and sustain their love of learning throughout life.
Knowledgeable	They develop and use conceptual understanding, exploring knowledge across a range of disciplines. They engage with issues and ideas that have local and global significance.
Thinkers	They use critical and creative thinking skills to analyse and take responsible action on complex problems. They exercise initiative in making reasoned, ethical decisions.
Communicators	They express themselves confidently and creatively in more than one language and in many ways. They collaborate effectively, listening carefully to the perspectives of other individuals and groups.
Principled	They act with integrity and honesty, with a strong sense of fairness and justice, and with respect for the dignity and the rights of people everywhere. They take responsibility for their actions and their consequences.
Open-minded	They critically appreciate their own culture and personal histories, as well as the values and traditions of others. They seek and evaluate a range of points of view, and they are willing to grow from the experience.
Caring	They show empathy, compassion and respect. They have a commitment to service, and they act to make a positive difference in the lives of others and in the world around us.
Risk-takers	Or Courageous. They approach uncertainty with forethought and determination; they work independently and cooperatively to explore new ideas and innovative strategies. They are resourceful and resilient in the face of challenges and change.

Balanced	They understand the importance of balancing different aspects of their lives— intellectual, physical, and emotional—to achieve well-being for themselves and others. They recognize their interdependence with other people and with the world in which they live.
Reflective	They thoughtfully consider the world and their own ideas and experience. They work to understand their strengths and weaknesses in order to support their learning and professional development.

Academic Integrity

QASMT recognises that academic integrity is embodied within the IB Mission Statement, values and IB Learner Profile. QASMT has developed an Academic Integrity Policy which is enacted throughout the Academy. A clear, positive approach to academic honesty as good practice is imperative to ensure that:

- teacher and student integrity is promoted through sound teaching and learning practice
- student research is properly conducted
- assessment is authentic
- intellectual property and copyright regulations of Australia are upheld. This policy is consistent with the International Baccalaureate's philosophy and expectations and is designed to support the Middle Years Programme's Standards and Practices.

The aim of this academic integrity policy is to:

- promote the principles and practices of academic integrity to ensure that students and teachers are fully aware
- ensure that students do not have unfair advantage over other students through academically dishonest practices such as collusion, duplication, plagiarism or assessment misconduct
- ensure that the principles and practices of academic honesty are explicitly taught
- detail the opportunities which students receive to learn about and practise academic honesty
- define the specific skills and knowledge students need, to practise academic honesty
- outline the procedures to be taken when malpractice or infringement may have occurred
- to provide a coherent approach across all year levels.

Year 9 STEM Futures Electives

The following table lists the STEM Futures Electives on offer in Year 9. Across Year 9 core subjects students cover Australian Curriculum requirements. Therefore, the choice and sequence of Year 9 STEM electives is open for students. Students choose two (2) STEM Futures Electives from the lists below.

Elective Name	Psychology	Computer Science	Biology	Chemistry	Sports Exercise and Health Science	Mathematics
Biochemical Solutions			X			
Forensic Psychology	X					
Future of Automation		X				-
Healthy Futures					X	
World of Reactions				X		
Code, Computation and Clarity						X

How do students choose their Year 9 electives?

The STEM Futures Electives are designed to allow students to start to specialise in their subject selection and focus on their curriculum areas of interest. To choose their electives for Year 9, students and families should follow these steps.

1. Consider the subjects the student is interested in studying in the IB Diploma Programme. Look also to subject invitations. A guide to IB DP subjects is available in this handbook on pages 11-15. Please read this section carefully and make a list of the subjects the student is most interested in studying in the IB DP. Note the IB DP subject group of the subjects in the list and ensure the student has chosen at least one subject from each group and a second subject from Group 3 or Group 4 instead of a Group 6 subject. It doesn't matter if you have more than six subjects you are interested in at this stage. You might want to consider pre-requisites for university courses, this is a handy link to information on The University of Queensland website https://study.uq.edu.au/study-options/undergraduate. Another useful link for considering future course interests is available from Queensland University of Technology at https://match-my-skills.qut.edu.au/.
2. Read the Overview of Year 9 STEM Futures Electives section in this handbook. Make a list of the STEM Futures Electives you are interested in studying; you will study one elective in Semester 1 and another in Semester 2. You will need to preference your selections from one to six.
3. Use the STEM Futures Electives table above to find the alignment to the IB DP subjects. Note which STEM Futures Electives align with the IB DP subjects you are interested in. IB DP subjects are listed across the 6 columns at the top of the table.

Year 9 STEM Futures Electives Overviews

Biochemical Solutions

Curriculum Focus

Biochemical Solutions combine the principles of biology and chemistry to explore and understand the essential biological macromolecules—carbohydrates, lipids, proteins, and nucleic acids—and how their structures relate to their roles in living systems. Students will investigate the function of biological enzymes and how their activity is influenced by environmental conditions, which is foundational in understanding the biochemical processes necessary for human digestion. This elective will enable students to explore real-world biochemical innovations, such as enzyme-based digestive aids or the development of food products tailored for individuals with specific metabolic needs.

Students will journey into the cell and its machinery to support life processes. They will explore the structure and function of two key organelles involved in energy transformations—mitochondria and chloroplasts. They will analyse how cellular respiration in mitochondria and photosynthesis in chloroplasts underpin life processes, and how these processes can be harnessed in biotechnology. Applications include microbial fuel cells that mimic mitochondrial function to generate electricity, or bioengineered algae that optimise photosynthesis for sustainable fuel production. Through these studies, students will see how understanding cell biology and biochemistry leads to innovations that address environmental and energy-related challenges.

Learning Outcomes

By the completion of this elective, students will:

· apply knowledge of cell biology and biochemistry in a range of applications

· understand the factors that affect the action of biological catalysts

· understand the role of biochemistry in human digestion

· apply biochemistry to real-world issues such as nutrition, energy production, and sustainability

· design, conduct and evaluate experiments, data and case studies related to biochemical systems

· consider the ethical and environmental impacts of biochemical technology solutions

Collaboration

- UQ School of Chemistry and Molecular Biosciences

World of Reactions

Curriculum Focus

Chemical reactions happen everywhere, every day, inside us and all around us, constantly occurring within plants and animals, the air in our atmosphere, the lakes and oceans that we swim in, and the soil where we grow our food. There is a staggering array of chemical reactions and understanding them is essential to understanding life and the world around us. We use chemical reactions to make useful products that make our lives easier. However, sometimes these products, such as plastics and the chemicals in our electronics and electrical equipment, can also have harmful effects on our environment. By understanding how chemical reactions work, scientists are able to predict the outcome of reactions, identify the products formed, make chemical processes more efficient and conserves the environment.

In this elective, students will extend their understanding of atoms and atomic structure and its relationship to chemical processes. A wide range of chemical reactions will be studied and students will learn to represent these using chemical symbols, formulae and equations. Students will examine the nature and reactions of acids and of metals, and investigate their use and impact in various applications such as ocean acidification, green chemistry, electronics and electrical equipment. Students will apply their understanding of chemical reactions to evaluate how the application of chemistry in contemporary issues affects people’s lives.

Learning Outcomes

By the completion of this elective, students will:

- investigate the physical and chemical properties of elements and compounds
- perform experiments involving various types of chemical reactions
- represent chemical reactions using balanced formulae and equations
- collect, analyse and evaluate data involving chemical reactions
- conduct a scientific inquiry concerning an application of the chemical reactions studied
- solve problems using mathematical methods.

Collaboration

- UQ School of Chemistry and Molecular Biosciences

Forensic Psychology

Curriculum Focus

Forensic Psychology focuses on criminality. Students will examine how psychological principles are applied to understand the minds of offenders, the development of criminal behaviour, factors that contribute to offending and how crimes are investigated.

The elective explores key theories and research that explain criminal behaviour through behavioural, cognitive and personality-based perspectives. Using a case study approach, students will analyse a range of psychological evidence. Topics will include criminal profiling, crime scene analysis, explanations for offender behaviour, jury decision-making and eyewitness reliability. This elective provides insight into how forensic psychologists work to interpret behaviour in the context of crime and justice.

Learning Outcomes

By the completion of this elective, students will:

- By the completion of this elective, students will:
- consider how a range of evidence is used to make a case and reach a verdict
- investigate biological, cognitive and social explanations of crime
- develop skills of inquiry, investigation and critical thinking
- communicate effectively using appropriate language and structure.

Collaboration

- UQ School of Psychology

Healthy Futures

Curriculum Focus

The world now has more young people than ever before – of the over 7 billion people worldwide, approximately 26% are under the age of 15. In this elective, students will explore the current and future health issues facing adolescents, both locally and globally. Students will identify challenges to adolescent health such as regular physical activity, balanced use of technology, balanced nutrition, a healthy state of mind and community connection.

An appreciation of how the human body works is essential in understanding the basis of health and prevention strategies. Students will learn how human cells, tissues and organ systems function together to carry out the activities needed to maintain internal balance for a healthy life. The impacts of regular physical activity, the use of technology and unbalanced nutrition on the physiological systems responsible for the maintenance of health in humans will be explored. Students will also examine the external influences that could impact on their ability to make good decisions and plan a creative health promotion that addresses a contemporary or future health concern.

Learning Outcomes

By the completion of this elective, students will:

- investigate the physiological basis of various health issues on the human body
- explore the impact of contemporary issues on adolescent health
- generate questions that can be investigated using scientific inquiry including observation, data recording, data analysis and critical thinking

- implement and refine leadership and collaboration skills
- apply and evaluate practical physical, tactical and strategic skills in a range of exercise and physical activity settings.

Future of Automation

Curriculum Focus

Computer science is the study of computers and computational systems. It covers a range of topics related to the theoretical aspects of computing, including algorithms and software design, and the application of computer science to solve practical problems

The purpose of this Year 9 course is to introduce students to the core principles of computational problem-solving. Students will engage with introductory programming exercises to determine specifications for inputs, outputs, constraints, and goals. Methods of abstraction, decomposition, pattern recognition and algorithm design will establish an important foundation for students' thinking skills, which will, in turn, encourage systematic approaches to solving real-world problems. Students will construct, trace and debug visual representations of algorithms before implementing programmed solutions.

The course will have a parallel focus on computer fundamentals, including data representation and logic. Students will describe how integers are able to be converted to binary and hexadecimal, and vice versa. Moreover, students will be able to explain the mechanisms by which data are stored in binary form, providing important context for the construction of longer, more nuanced programs that require a range of local and global variables. By creating more complex systems, students will learn important debugging and exception handling techniques that will build autonomy and confidence for the rigours of the Diploma Programme (DP).

Learning Outcomes

By the completion of this elective, students will:

· apply computational thinking strategies to define, decompose and solve problems.
· construct and trace algorithms using visual tools and structured programming.
· describe how data is represented and manipulated in binary.
· develop programs using appropriate variables, control structures and arrays.

Code, Computation and Clarity

Curriculum Focus

Mathematics helps us make sense of the world through patterns, structure, and logical reasoning. From navigating everyday decisions to exploring abstract problems, it allows us to test conjectures, construct arguments, and uncover hidden connections. This course develops skills not just in calculation, but in the language of mathematics, fostering creativity, precision, and proof.

Designed for students with a strong interest and aptitude in mathematics, this elective introduces advanced topics beyond the standard curriculum. Students will explore number systems, matrices, geometry, cryptography, and later, complex numbers, logic, and numerical methods. Technology will be a key tool for investigation and problem-solving. The course prepares students for higher-level mathematical thinking through deep inquiry, collaboration, and application.

Learning Outcomes

By the end of the course, students will be able to:

- Solve problems using binary, modular arithmetic, and other number systems
- Perform matrix operations and apply them to linear systems
- Prove geometric results involving circles and cyclic quadrilaterals
- Apply mathematical ideas in cryptography and real-world contexts

- Use permutations, combinations, and distributions to solve complex counting problems
- Model and analyse sequences, including annuities and recurrence relations
- Apply numerical methods to approximate solutions
- Work confidently with complex numbers and logical arguments
- Use technology to model, explore, and communicate mathematical solutions

Students will complete both theoretical and applied tasks, with a strong focus on reasoning, problem-solving, and independent exploration.

Year 10 Diploma Preparation Program

The Year 10 program prepares students for the rigours of the IB Diploma Programme. The entire year curriculum program is designed to support students in their preparation for DP subjects. During Year 10 students will be provided with further information on the differences between choosing their subjects at either the Standard or Higher (SL or HL) levels.

If students plan to study a subject in the DP, it is imperative they are in the correct DPP subjects in Year 10 to best prepare them for those subjects.

International Baccalaureate Diploma Programme

The International Baccalaureate (IB) Diploma Programme (DP) is a rigorous and academically challenging pre-university curriculum for students aged from 16 to 19 years. The programme emphasises the importance of breadth and depth in academic study whilst maintaining a focus on the very way we understand knowledge through the Theory of Knowledge course. Students are encouraged to become active global citizens and understand the importance of care and compassion in an increasingly globalised world. The Diploma encourages students to develop their physical, emotional, intellectual and ethical selves and as such is well regarded and recognised by the world's leading universities.

The IB Diploma Programme curriculum overview

In the DP, students study six subject groups. At QASMT, students study an additional Sciences or Individuals and Societies subject instead of The Arts.

At the core of the Diploma Programme are the three course requirements that broaden the Diploma program experience and require students to apply their knowledge and understanding. The core includes the *Theory of Knowledge* course, the *Extended Essay* and *Creativity, Activity and Service*.

- **The extended essay** is a requirement for students to engage in independent research through an in-depth study of a question relating to one of the subjects they are studying.
- **Theory of knowledge** is a course designed to encourage each student to reflect on the nature of knowledge by critically examining different ways of knowing (perception, emotion, language and reason) and different kinds of knowledge (scientific, artistic, mathematical and historical).
- **Creativity, activity, service** requires that students actively learn from the experience of doing real tasks beyond the classroom. Students can combine all three components or do activities related to each one of them separately.

Subjects offered in the IB Diploma Programme

Students must study six subjects when undertaking the Diploma Programme, with one subject being chosen from each of Groups 1 to 5. The sixth subject may come from Group 3 or 4. Three subjects must be studied at standard level (equivalent of 150 teaching hours each subject) and three at higher level (equivalent of 240 teaching hours each subject). Subjects are significantly more rigorous at HL level than at SL level. HL courses are designed for students with the high level of skills and understandings needed to succeed with the extra breadth and depth of subject material.

During the two-year program students will also complete an Extended Essay, study a Theory of Knowledge course and participate in the Creativity, Activity & Service course. The International Baccalaureate Organisation (IBO) has comprehensive guidelines that must be adhered to in order for students to receive the IB Diploma qualification.

Subject Overviews

Group 1 – Studies in Language and Literature

English Language and Literature

English Language and Literature provides students with the opportunity to learn about the complex and dynamic nature of language and explore both its practical and aesthetic dimensions. A core element of the course is the examination of the crucial role language plays in communication, reflecting experience and shaping the world. Students will also learn about their own roles as producers of language and develop their productive skills. Language choices, text types, literary forms and contextual elements all effect meaning. Through close analysis of various text types and literary forms, students will consider their own interpretations, as well as critical perspectives of others, to explore how such positions are shaped by cultural belief systems and to negotiate meanings of texts. Students will engage in activities that involve them in the process of production as well as help shape their critical awareness of how texts and their associated visual and audio elements work together to influence the audience/reader's interpretation. With its focus on a wide variety of communicative acts, the course enables students to develop an understanding of the foundational nature, and persuasive influence of language in local, national and global contexts.

Group 2 – Language Acquisition

Language courses aim to develop a variety of linguistic skills and a basic awareness of the target culture(s) through the study of a core syllabus and language-specific syllabuses.

Language B

Language B is a language acquisition course designed for students with some previous experience of the target language. In the language B course, students further develop their ability to communicate in the target language through the study of language, themes and texts. In doing so, they also develop conceptual understandings of how language works, as appropriate to the level of the course. Students continuing their language acquisition studies from the IB Middle Years Programme, will study the same language in the IB Diploma Programme at Language B. Language B subjects offer include Chinese, French, German, Japanese and Latin.

Ab Initio

This beginner language course is designed for students who have some or no previous experience of learning or speaking the target language. The focus of the courses is on the acquisition of a new language for purposes and situations usual in everyday social interaction. These courses are not available for native speakers or students who have engaged in significant study of the language, including the IB Middle Years Programme. Further details about Ab Initio courses on offer at QASMT will be provided during subject selection for the Diploma Preparation Program. The Language ab initio subject offered is Spanish.

Group 3 – Individuals and Societies

Business Management

Business Management is a rigorous, challenging and dynamic discipline in the individuals and societies subject group. The role of businesses, as distinct from other organisations and actors in a society, is to produce and sell goods and services that meet human needs and wants by organising resources. Profit- making, risk-taking and operating in a competitive environment characterise most business organisations.
The Business Management course is designed to develop students' knowledge and understanding of business management theories, as well as their ability to apply a range of tools and techniques. Students learn to analyse, discuss and evaluate business activities at local, national and international levels. The course covers a range of organisations from all sectors, as well as the socio-cultural and economic contexts in which those organisations operate.

Emphasis is placed on strategic decision-making and the operational business functions of human resource management, finance and accounts, marketing and operations management. Links between the topics are central to the course, as this integration promotes a holistic overview of Business Management. Through the exploration of six concepts underpinning the subject (change, culture, ethics, globalisation, innovation and strategy), the Business Management course allows students to develop their understanding of interdisciplinary concepts from a business management perspective.

Economics

Economics, a dynamic social science, is essentially about dealing with scarcity, resource allocation and the methods and processes by which choices are made in the satisfaction of human wants. As a social science, economics uses scientific methodologies that include quantitative and qualitative elements.

The Economics course emphasises the economic theories of microeconomics, which deal with economic variables affecting individuals, firms and markets, and the economic theories of macroeconomics, which deal with economic variables affecting countries, governments and societies. These economic theories are to be applied to real-world issues. Prominent among these issues are fluctuations in economic activity, international trade, economic development and environmental sustainability. The ethical dimensions involved in the application of economic theories and policies permeate throughout the economics course as students are required to consider and reflect on human end-goals and values.

The Economics course encourages students to develop international perspectives, fosters a concern for global issues, and raises students' awareness of their own responsibilities at a local, national and international level. The course also seeks to develop values and attitudes that will enable students to achieve a degree of personal commitment in trying to resolve these issues, appreciating our shared responsibility as citizens of an increasingly interdependent world.

Psychology

Psychology is the systematic study of behaviour and mental processes. Psychology has its roots in both the natural and social sciences and a variety of research designs are utilised. Overall Psychology provides a unique approach to understanding modern society.

Psychology examines the interaction of biological, cognitive and sociocultural influences on human behaviour, thereby adopting an integrative approach. Understanding how psychological knowledge is generated, developed and applied enables students to achieve a greater understanding of themselves and appreciate the diversity of

human behaviour. The ethical concerns raised by the methodology and application of psychological research are key considerations in Psychology.

Psychology takes a holistic approach that fosters intercultural understanding and respect. In the core of the Psychology course, the biological approaches to understanding behaviour demonstrates what all humans share, whereas the cognitive and sociocultural approaches to understanding behaviour reveal the immense diversity of influences that produce human behaviour and mental processes. Cultural diversity is explored and students are encouraged to develop empathy for the feelings, needs and lives of others within and outside their own culture, therefore contributing to an international understanding.

Group 4 – Sciences

Biology

Biology is an experimental science that combines academic study with the acquisition of practical and investigational skills. Biologists attempt to understand the living world at all levels using many different approaches and techniques. At one end of the scale is the cell, its molecular construction and complex metabolic reactions. At the other end of the scale biologists investigate the interactions that make whole ecosystems function. Apart from being a subject worthy of study in its own right, Biology is recommended for students wishing to study medicine, biological science and environmental science in higher education and serves as useful preparation for employment.

Chemistry

Chemistry is an experimental science that combines academic study with the acquisition of practical and investigational skills. It is called the central science as chemical principles underpin both the physical environment in which we live and all biological systems. Apart from being a subject worthy of study in its own right, chemistry is a prerequisite for many other courses in higher education, such as medicine, biological science and environmental science and serves as useful preparation for employment. Chemistry is recommended for students interested in university studies in all science fields, for many universities Chemistry is a pre-requisite study requirement.

Computer Science

Computer science requires an understanding of the fundamental concepts of computational thinking as well as knowledge of how computers and other digital devices operate. The Computer Science course is engaging, accessible, inspiring and rigorous. It has the following characteristics:

- draws on a wide spectrum of knowledge
- enables and empowers innovation, exploration and the acquisition of further knowledge
- interacts with and influences cultures, society and how individuals and societies behave
- raises ethical issues
- is underpinned by computational thinking.

Computer Science students will become aware of how computer scientists work and communicate with each other and with other stakeholders in the successful development and implementation of IT solutions. While the methodology used to solve problems in computer science may take a wide variety of forms, the Computer Science course emphasizes the need for both a theoretical and practical approach.

Environmental Systems and Societies (ESS)

ESS is an interdisciplinary group 3 and 4 course. As an interdisciplinary course, ESS is designed to combine the methodology, techniques and knowledge associated with group 4 (sciences) with those associated with group 3 (individuals and societies). Because it is an interdisciplinary course, students can study ESS and have it count as *either a group 3 or a group 4 course*, or as both. If students choose the latter option, this leaves the opportunity to study an additional subject from any other group, including an additional group 3 or group 4 subject.

ESS is a complex course, requiring a diverse set of skills from its students. It is firmly grounded in both a scientific exploration of environmental systems in their structure and function and in the exploration of cultural, economic, ethical, political, and social interactions of societies with the environment. As a result of studying this course, students will become equipped with the ability to recognize and evaluate the impact of our complex system of societies on the natural world. The interdisciplinary nature of the course requires a broad skill set from students

and includes the ability to perform research and investigations and to participate in philosophical discussion. The course requires a systems approach to environmental understanding and problem-solving, and promotes holistic thinking about environmental issues. It is recognized that to understand the environmental issues of the 21st century and suggest suitable management solutions, both the human and environmental aspects must be understood. Students should be encouraged to develop solutions from a personal to a community and to a global scale.

Physics

Physics is an experimental science that combines academic study with the acquisition of practical and investigational skills. It is the most fundamental of the experimental sciences as it seeks to explain the universe itself, from the very smallest particles – like quarks and leptons (perhaps 10^{-17} m in size), perhaps truly fundamental – to the size of the universe itself. Students with an aptitude in Mathematics or physical science or simply a desire to work in fields like Astronomy, Nanotechnology, Rocketry, Medicine, Engineering, Dentistry, Architecture or Photonics (to name a few), should consider studying the Physics Programme. A challenging but richly rewarding program of study, with many exciting career options available.

Sports, Exercise and Health Science (SEHS)

SEHS is an experimental science that combines academic study with the acquisition of practical and investigative skills in the context of health and exercise. It is an applied science course, with aspects of biological and physical science being studied within the specific contexts of health and physical activity. Students are introduced to the traditional disciplines of anatomy and physiology, biomechanics, nutrition and training principles. Topics covered in this course include anatomy, function of the musculoskeletal system, physics of motion (forces, Newton's Laws of Motion, projectile motion), nutrition and components of fitness. Students undertake both theory and practical work, and are introduced to the scientific inquiry skills required to successfully undertake a scientific research project. Students apply their learning to practical activities in various indoor and outdoor scenarios, however practical skills are not assessed in this course.

Group 5 – Mathematics

Mathematics has been described as the study of structure, order and relation that has evolved from the practices of counting, measuring and describing objects. Mathematics provides a unique language to describe, explore and communicate the nature of the world we live in as well as being a constantly building body of knowledge and truth in itself that is distinctive in its certainty.

Two courses are available in Mathematics and both subjects are designed to appeal to students with varying levels of ability and motivation in mathematics, but will be developing their mathematics fluency, their ability to think mathematically, to recognise mathematics around them and to be able to use their mathematics in either abstract or contextual settings.

Mathematics Analysis and Approaches

This course is designed for students who enjoy developing their mathematics, to become fluent in the construction of mathematical arguments and develop strong skills in mathematical thinking. They will explore real and abstract applications, sometimes with technology, and will enjoy mathematical problem solving and generalisation. This course caters for students with a good background in mathematics who are competent in a range of analytical and technical skills. The majority of these students will be expecting to include mathematics as a major component of their university studies, either as a subject in its own right or within courses such as physics, engineering and technology. Others may take this subject because they have a strong interest in mathematics and enjoy meeting its challenges and engaging with its problems.

Mathematics Applications and Interpretation

This course is designed for students who are interested in developing their mathematics for describing our world, modelling and solving practical problems using the power of technology. Students who take Mathematics: Applications and Interpretation will be those who enjoy mathematics best when seen in a practical context. This

subject is aimed at students who will go on to further education in order to study subjects such as social sciences, natural sciences, statistics, business, some economics, psychology, and design, for example.

Queensland Academy for Science Mathematics and Technology

Inspiring Great Minds

Queensland Academy of Science, Mathematics & Technology

Year 9 Subject Selection – 2026

Subject selections are completed online at OneSchool (oslp.eq.edu.au). Students login using their school username and password, subject selections only become available on the published date in Term 3.

All students study English Language and Literature, Mathematics, Individuals and Societies, Science and their chosen Language Acquisition subject.

Students study two (2) STEM Futures Electives from the list below.

Students must preference the six (6) electives, as choices three (3), four (4), five (5) or six (6) will be allocated if their first and second preferences are not available. The STEM Futures Electives are:

- Forensic Psychology (Psychology)
- Biochemical Solutions (Biology)
- World of Reactions (Chemistry)
- Future of Automation (Computer Science)
- Healthy Futures (SEHS)
- Code, Computation and Clarity (Mathematics)

Please refer any questions about subject selections to the Deputy Principal Performance – Ms Kate Oxenford at koxen11@eq.edu.au or 07 3377 9333.

Please do not return this form, subject selections must be done online through the portal indicated above.