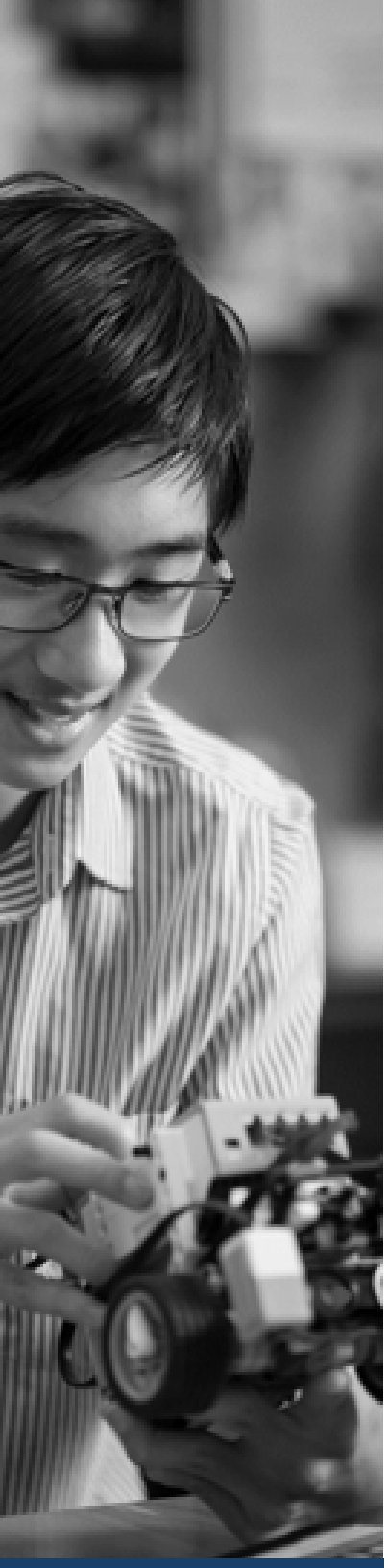

STEM PHILOSOPHY

Vision
Preparing students for success in the 21st Century.

Background
STEM stands for science, technology, engineering and mathematics. It touches every aspect of today's world, and the innovations that emerge from these fields underpin the global economy.

The Australian Government considers high-quality science, technology, engineering and mathematics (STEM) education as essential for Australia's current and future productivity. It also values STEM education for developing informed personal decision-making and effective community, national and global citizenship.

Employment opportunities in STEM related industries are increasing each year. Employers are looking for:

- **Analytical Skills** – Analysing and interpreting information and assessing the best course of action.
- **Scientific skills** – Breaking down complex scientific concepts and systems.
- **Mathematical skills** – Accurately gathering and analysing data. Applying simple and complex equations to solve problems.
- **Technical skills** – Troubleshooting and debugging a complex technological system or repairing a machine.

While obtaining STEM related qualifications is extremely important, studying STEM subjects also provides transferable skills that are essential to competing in today's job market. These transferable skills include:

- problem solving
- creativity
- critical analysis
- teamwork
- independent thinking
- initiative
- communication
- digital literacy

The integrated, interdisciplinary approach of STEM education provides practical and relevant learning experiences for students. More than just the transfer of knowledge. STEM teaching and learning engages students and prepares them with critical thinking, problem solving, creative and collaborative skills.

ROCHEDALE STATE HIGH SCHOOL

STEM EXCELLENCE PROGRAM

Preparing students for success in the 21st Century

PROSPECTUS

AN OVERVIEW OF OUR STEM PHILOSOPHY, EXPECTATIONS FOR PARTICIPANTS, AND PROGRAM STRUCTURE

Senior pathways

Employer demand for graduates with STEM qualifications and skills is on the rise. The STEM Excellence Program provides students with the ideal foundation to pursue senior subjects ideally structured for students considering STEM related career paths.

Science	• Physics • Chemistry • Biology
Maths	• General Mathematics • Mathematical Methods • Specialist Mathematics
Technology	• Engineering Technology • Design • Digital Solutions

STEM Excellence Program Overview

Year 7	Year 8
Unit 1 –Introductory to STEM Mini STEM Maths Activities • **Let's go Shopping** (Week 2) solving problems with purchases • **Perimeter Triangles** (Week 3) Math and logic using perimeter and counting patterns • **Patch Wants to Fly** (Week 4) problem solving using measurement • **Making Toys** (Week 5 & 6) create, record and market a new toy • **Mini Golf Course** (Week 7,8,9) using angles and measurement to design a golf course	**Unit 1 – Incubate or Resuscitate** Develop a Reptile Incubator *World Science Festival excursion*
Unit 1 – Make it Drinkable Create a Filtration Prototype *World Science Festival excursion*	**Unit 2 – Geological Phenomena** Tunnelling and Rocks *Griffith STEM Challenges*
Unit 3 and 4 – Sustainable Future Prototype Lighting using Solar Power *Science Centre – Spark Lab + QLD Museum*	**Unit 3 – The Thrill Seeker** Marble Run *Guest Speaker*
	Unit 4 – Incredible Edible Cell Making a Cell *UQ Idea Hub*
Year 9	
Term 1 – Aerodynamics and Forces *Balsa gliders*	**Term 3 – Coding Algorithm Emergency Vehicle**
Term 2 – Plant Cultivation	**Tern 4 - Projectile Motion and release drop** *UAV challenge Drones*

Our Mission

Our aim is to prepare students to take advantage of the many opportunities a knowledge-based economy offers and become the entrepreneurs of tomorrow. Through our problem-based curriculum design, we aspire to engage students in independent, innovative and inquiry-centred learning activities that develop subject-area expertise and equip students with invaluable 21st century skills.

Through our STEM programs, we aim to provide students with real world opportunities to solve in curriculum as well as chances to compete in elite extra-curricular activities.

STEM @ RSHS

STEM CURRICULUM

STEM Excellence Program

The STEM Excellence Program offers students the opportunity to engage in an interdisciplinary curriculum design centred on solving real world problems.

Each semester, student are accelerated through the Maths and Science curriculum and are then given the opportunity to apply their knowledge through a STEM project. Students are presented with an authentic problem that requires them to draw on their Maths and Science content knowledge to design, create and evaluate a solution.

National Curriculum

STEM is addressed in the Australian Curriculum through the learning areas of Science. Technologies and mathematics, and through the General Capabilities, particularly Numeracy. Information and Communication Technology (ICT), and Critical and Creative Thinking. Engineering is addressed in Design and Technologies through a dedicated content description at each band that focuses on engineering principles and systems. It is evident across the curriculum through Science, digital Technologies and Mathematics, Engineering often provides a context for STEM learning.

In designing the STEM curriculum, our expert teaching team align our projects with the relevant content descriptors and achievement standards from the Maths, Science and Technologies' curriculums.

Evidence from the project suggests that STEM knowledge, understanding and skills seem to be:

- Strengthened when the connections between learning areas are emphasised.
- Enriched when learning areas combine to find authentic learning opportunities for students in answer to an identified problem or in the creation of a solution.

Excursions & Competitions

As a part of the STEM Excellence Program, students will have the opportunity to participate in a variety of excursions and competitions run by third party providers who are experts in STEM. We are proud of the expert partnerships we have developed with professional organisations and tertiary institutions that seek to stimulate our students' natural curiosity and encourage students to pursue future pathways in STEM.

We are highly competitive in a variety of STEM competitions, some which are conducted within the curriculum and some extra-curricular. These competitions provide students with an invaluable opportunity to extend their understanding and challenge themselves in a new context.

In order to participate in excursions and competitions, there may occasionally be costs involved Our STEM families will be notified in advance of any pending financial requirements. Payment plans can be made available through application at the discretion of the Principal.