

# SCIENCE

CORE SUBJECT: Across Four Semesters

## WHY STUDY SCIENCE

Science provides an opportunity for students to answer questions about how our physical, chemical and biological world functions. In today's technologically advanced society, students are able to access the most up to date facts and evidence, to contest and refine their knowledge, to use inquiry skills and answer many of these scientifically orientated questions.

Science allows individuals and groups to be active citizens in their personal, social and economic lives. Students are able to develop and acquire knowledge, understanding and inquiry skills to question the direction that science takes in society, the contributions of historical and cultural contributions, current practices, contemporary issues and how many career choices involve science.

## COURSE AIMS:

In particular, students at Mercy College Mackay in Science develop:

- a solid foundation of the nature of the biological, chemical, physical and earth sciences.
- inquiry skills through questioning, hypothesizing, planning, conducting experiments and investigations (based on ethical principles), collecting and analyzing data, evaluating results and drawing critical evidence-based conclusions
- an appreciation and understanding of social, cultural and historical factors as they consider the interactions between science and current social practices
- 21 century skills including: Literacy, numeracy and ICT skills, critical and creative thinking skills, and cooperative skills
- life skills and a futures perspective as they engage in a range of science activities as informed and active citizens in society

## COURSE ORGANISATION:

The study of Science in Years 7 and 8 is a four semester program. **Using Australian Curriculum Science**, units are organized into four sub strands of **Science Understanding**.

**Chemical Sciences:** students study the ideas that scientists have about the structure of materials. They investigate properties of materials, the patterns of interaction between materials, and the effect of changes on the usefulness of materials.

**Physical Sciences:** students explore the effects of forces in their lives, the methods of harnessing energy, the way energy is used, and the social and environmental consequences of energy use.

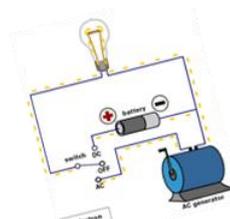
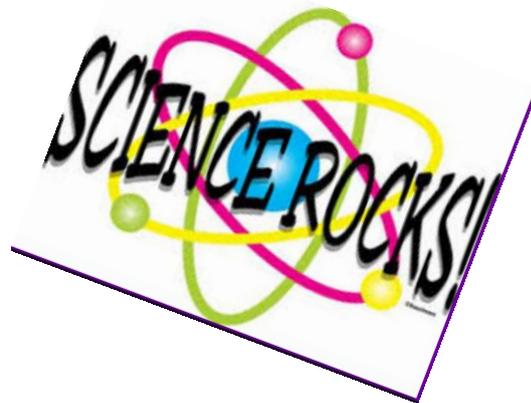
**Biological Science:** students explore the great diversity of structure and lifestyle of living things and how living things interact with each other and with the world in which they live.

**Earth and Space Sciences:** students explore ideas about the dynamic nature of the Earth, solar system and universe.

**Human Endeavour and Science Inquiry Skill** strands are embedded into all science units offered.

**Science as a Human Endeavour:** this strand focuses on the nature and influence of society.

**Science Inquiry Skills:** this strand focuses on the skills essential for working scientifically and includes: questioning and predicting, planning and conducting, processing and analyzing data and information, evaluating and communicating.

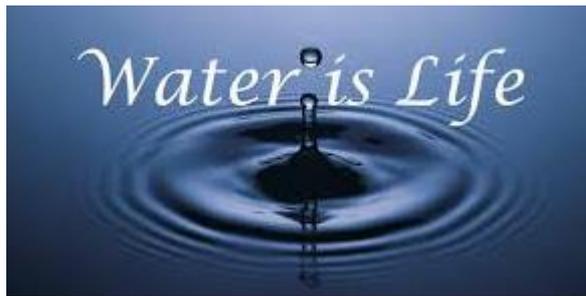


## Year 7 Units

### Semester 1 – 7SCIE Water the Essence of Life

#### In Semester 1 Year 7:

Students are introduced to the Science Laboratory, equipment, safety and scientific terminology are explored. Students will apply this knowledge and skills to investigate the importance of water both in terms of its chemical properties and as an element of life for living organisms. Students will explore Year 7 chemistry concepts, recognising the difference between pure substances and mixtures. They will investigate and **describe** (using a range of physical separation techniques) how to purify dirty water. Students will **describe** how science is used in occupations associated with water treatment plants. Biological sciences will focus on life systems that need water, both those living in and those living around water. Students will **organise and classify** organisms based on observable characteristics and **predict** feeding relationships between organisms in a wetland habitat.



**Inquiry skills:** Students will **identify** scientific questions to investigate associated with the purification process of dirty water, **plan** methods and **select** equipment, **describe** safety considerations, **analyse** collated data, **evaluate** and **summarise** their findings in a scientific report.

### Semester 2 - SC451 Motion, Forces and Resources.

#### In Semester 2 Year 7:



Students will explore energy and forces and apply the concepts learnt about contact/non-contact, balanced/unbalanced forces, to **investigate, represent and predict** the forces acting on a parachute when considering the question – ‘Does the size of a parachute canopy impact on its landing time?’ Students will explore how forces have an impact on our Solar System and generate seasons, tides and eclipses. They will also **analyse** sustainable resource usage associated with cane farming.

**Inquiry skills:** Students will consolidate inquiry skills associated with investigating a parachute’s motion. They will **plan and select** equipment, **describe** safety, **identify** variables and fair testing considerations, **analyse** and graph collated data, **evaluate** and **summarise** their findings from group work individually in a scientific report.

### Assessment

In **Year 7 Semester 1** the students will complete a response to stimulus on water separation techniques (Chemistry) and an exam on classification of organisms at Keeley’s Road wetlands (Biology).

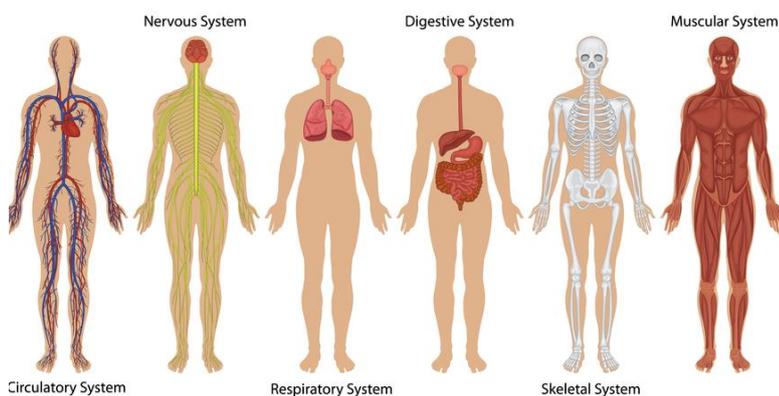
In **Year 7 Semester 2** the students will complete a scientific report on parachute motion (Physics), an exam (Earth, Sun and Moon) and a multimodal presentation on Earth’s Resources (Earth Sciences).

## Year 8 Units

### Semester 3 – SC557 The Human Body and Energy

#### In Semester 1 Year 8:

Students will build on their foundational knowledge of Biology to **analyse** and learn about the different body systems in animals. They will consider how their structure (cell, tissue, and organs) is related to their function. Students will investigate aerobic energy systems, including the respiratory and circulatory systems. They will build on foundational Physics, applying potential (stored) energy and kinetic (action) energy to the functioning of the muscular and digestive systems. Energy transfer and transformation will be explored through energy chains with spinners, electrical circuits and food charts. They will also investigate energy transformation of catapults.



**Inquiry skills:** Students will **analyse** data associated with lung capacity and heart rate, **dissect** a heart and chicken wing, use microscopes to **investigate** and **compare** the structure of plant and animal cells, **compare** the digestive system of the cow and dog and use data to justify their **conclusions**. They will **analyse** motion graphs, energy (food) tables, and **plan**, build, **test**, **analyse** and **communicate** an investigation into energy transformations of a catapult.

### Semester 4 – SC 559 Matter: What our World is made of

#### In Semester 2 Year 8:

Students will examine the layers of the earth, incorporating the states of matter solid, liquid and gas. They will develop an understanding of our changing earth, its geological formations and types of rocks and minerals. Following this they will look at what rocks are made of; that is, matter. Matter is made up of elements that can be found on the periodic table. Students will then make assumptions on whether rocks are elements or not? Finally they will develop an understanding of physical and chemical changes and during this unit will travel to significant geological sites in the Mackay Region.



**Inquiry Skills:** Students will **analyse** the theories concerning the formation of the Earth's surface. They will **investigate** the rock cycle and types of rocks through a field excursion. They will **analyse** the periodic table and **construct** atomic models also **formulate** and **test** hypothesis about physical and chemical changes.

### Assessment

In **Year 8 Semester 1** the students will complete a scientific report on the heart following a dissection (Biology), an exam on types of energy and a scientific report on energy transformations in catapults (Physics). In **Year 8 Semester 2** the students will complete an exam on elements, compounds and atomic structure (Chemistry) and written response to stimulus on rock formations and landforms following an excursion (Earth Sciences).