YEAR 9 CORE: SCIENCE

Semester 1

The two strands of the Victorian Curriculum Science, Science Understanding and Science Inquiry Skills are taught in an integrated way. The Science Understanding strand includes students recognising that energy transfer through different mediums can be explained using the wave and particle models. It also includes investigating factors that affect the transfer of energy through an electric circuit. It also includes recognising that the interaction of magnets can be explained by a field model and that magnets are used in the generation of electricity and the operation of motors. It includes recognising that some of the Earth`s resources are renewable, but others are non-renewable. The Science Inquiry Skills strand includes students analysing their methods and the quality of their data, and explaining specific actions to improve the quality of their evidence. They also learn to evaluate others' methods and explanations from a scientific perspective and use appropriate language and representations when communicating their findings and ideas to specific audiences.

Science Understanding
Students will learn:

- To recognise that the Law of Conservation of Energy explains that total energy is maintained in energy transfers and transformations
- To recognise that in energy transfers and transformations, a number of steps can occur and the system is not 100% efficient so that usable energy is reduced
- To consider how choices related to the use of fuels are influenced by environmental, social and political considerations
- To explore how images can change when the arrangement of the mirror or lens is altered
- To observe the spread and order of colours in the visible spectrum
- To describe the different types of radiation in the larger spectrum of radiation
- To use a wave model to describe the measured properties of sound, wavelength and frequency
- To investigate parallel and series circuits and measure voltage drops across and currents through various components
- To compare circuit design to household wiring
- To investigate the action at a distance or the field model around magnets of different shapes
- To investigate the movement of a magnet and a wire to produce electricity
- To investigate the effect of a magnet on a current from a battery to produce movement

Science Inquiry Skills
Students will be able to:

- Formulate questions that can be investigated within the scope of the classroom or field with available resources
- Develop ideas from students' own or others' investigations and experiences to investigate further
- Revise and refine research questions to target specific information and data collection to the specific problem identified
- Explain the choice of variables to be controlled, changed and measured in an investigation
- Identifying and managing potential hazards used in experimental investigations
- To decide how much data are needed to obtain reliable measurements
- To select and use probes and data loggers to record information

Critical and Creative Thinking
Students will learn to :

- Assess the viability of a solution by considering the risks associated with it
- Explain and apply a range of techniques to test validity within and between arguments

Semester 2

The two strands of the Victorian Curriculum Science, Science Understanding and Science Inquiry Skills are taught in an integrated way. The Science Understanding strand includes students recognising that living organisms respond to their environment to stay healthy. Organisms use coordinated and interdependent internal systems to respond to changes in their environment. It also includes identifying that living organisms use enzymes to change the rate at which chemical reactions occur, as well as examining how the Collision Theory can also be used to predict how changes will affect the rate of a chemical reaction. Students will also identify that controlling the rates of chemical reactions is used by the chemical industry. The Science Inquiry Skills strand includes students designing questions that can be investigated using a range of inquiry skills. Students also design methods that include the control and accurate measurement of variables and systematic collection of data and describe how they considered ethics and safety. Critical and creative thinking is also assessed in Science. Students learn and apply techniques to progress, analyse and evaluate thinking. Students develop an understanding that it is often necessary to take a range of perspectives and challenge assumptions.

Science understanding
Students will learn:

- To consider the role of energy in chemical reactions
- To recognise that the conservation of mass in a chemical reaction can be demonstrated by simple chemical equations
- To investigate how chemical reactions result in the production of a range of useful substances, including the key chemical equations required for life.
- To use word or symbol equations to represent chemical reactions
- To describe how the requirements for life (oxygen, nutrients, water and removal of waste) are provided through the coordinated function of body systems, for example, the respiratory, circulatory, digestive, nervous and excretory systems
- To explain (using models, flow diagrams or simulations) how body systems work together to maintain a functioning body
- To investigate the body's response to changes as a result of the presence of micro-organisms
- To identify functions for different areas of the brain
- To model the 'knee jerk' reaction and explain why it is a reflex action
- To identify responses involving the nervous and endocrine systems

Science Inquiry Skills
Students will be able to:

- Apply specific skills in the use of scientific instruments
- Select and use probes and data loggers to record information
- Identify how human error can influence the reliability of data
- Use spreadsheets to present data in tables and graphical forms and to carry out mathematical analyses of data
- Design and construct appropriate graphs to represent data and to look for trends and patterns
- Explore relationships between variables using spreadsheets, databases, tables, charts, graphs and statistics
- Describe data properties (for example mean, median, range, outliers, and large gaps visible on a graph) and their significance for a particular investigation sample, acknowledging uncertainties