Victorian Curriculum Links Years 9 - 10

Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries	
Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current	● Investigating parallel and series circuits and measuring voltage drops across and currents through various components ● Investigating the properties of components such as LEDs, and temperature and light sensors ● Comparing circuit design to household wiring ● Exploring the use of sensors in robotics and control devices
The interaction of magnets can be explained by a field model; magnets are used in the generation of electricity and the operation of motors	● Investigating the movement of a magnet and a wire to produce electricity ● Investigating the effect of a magnet on a current from a battery to produce movement
Energy flow in Earth's atmosphere can be explained by the processes of heat transfer	● Recognising that the Law of Conservation of Energy explains that total energy is maintained in energy transfers and transformations ● Recognising 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
Formulate questions or hypotheses that can be investigated scientifically, including identification of independent, dependent and controlled variables	● Formulating questions that can be investigated within the scope of the classroom or field with available resources ● Developing ideas from students' own or others' investigations and experiences to investigate further ● Revising and refining research questions to target specific information and data collection or finding a solution to the specific problem identified
Independently plan, select and use appropriate investigation types, including fieldwork and laboratory experimentation, to collect reliable data, assess risk and address ethical issues associated with these investigation types	● Explaining the choice of variables to be controlled, changed and measured in an investigation ● Deciding how much data are needed to obtain reliable measurements ● Using modelling and simulations, including using digital technologies, to investigate situations and events ● Using the internet to facilitate collaboration in joint projects and discussions
Select and use appropriate equipment and technologies to systematically collect and record accurate and reliable data, and use repeat trials to improve accuracy, precision and reliability	● Applying specific skills in the use of scientific instruments ● Selecting and using probes and data loggers to record information ● Identifying how human error can influence the reliability of data
Construct and use a range of representations, including graphs, keys, models and formulas, to record and summarise data from students' own investigations and secondary sources, to represent qualitative and quantitative patterns or relationships, and distinguish between discrete and continuous data	● Using spreadsheets to present data in tables and graphical forms and to carry out mathematical analyses of data ● Designing and constructing appropriate graphs to represent data and to look for trends and patterns
Analyse patterns and trends in data, including describing relationships between variables,	● Exploring relationships between variables using spreadsheets, databases, tables, charts, graphs and statistics

identifying inconsistencies in data and sources of uncertainty, and drawing conclusions that are consistent with evidence	● Describing data properties (for example mean, median, range, outliers, large gaps visible on a graph) and their significance for a particular investigation sample, acknowledging uncertainties
Use knowledge of scientific concepts to evaluate investigation conclusions, including assessing the approaches used to solve problems, critically analysing the validity of information obtained from primary and secondary sources, suggesting possible alternative explanations and describing specific ways to improve the quality of data	● Discussing what is meant by 'validity' and how we can evaluate the validity of information in secondary sources ● Judging the validity of science-related media reports and how these reports might be interpreted by the public ● Using primary or secondary scientific evidence to support or refute a conclusion or claim ● Suggesting more than one possible explanation of the data presented
Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations	● Using secondary sources as well as students' own findings to help explain a scientific concept ● Using a range of representations, including mathematical and symbolic forms, to communicate science ideas ● Presenting results and ideas using formal experimental reports, oral presentations, multimodal presentations, poster presentations and contributing to group discussions