



STEINER EDUCATION AUSTRALIA

AUSTRALIAN STEINER CURRICULUM FRAMEWORK

2011

SCIENCE

Scope & Sequence

High School

Revisions in this document

Science Understanding				
	Year 7	Year 8	Year 9	Year 10
Biological Sciences	<p>The healthy conditions for the life processes of breathing, nutrition, warming, circulation, growth and reproduction are linked to human practices.</p> <p>Succession, spacing, composting, bed maintenance and correct harvesting of annual and perennial plants.</p>	<p>The human body sense organs and the organs of willful movement have incorporated, physical laws in their function e.g. eye; muscles joints and bone. Lens optics.</p> <p>Four part rotation with mini crops: Composting heap as an organism - its life cycle; The cultivated crops.</p>	<p>Human and vertebrate skeletons are homologous (evolutionary connection) and the anatomy of these structures reveal functionality connected to instinct and / or intentionality.</p> <p>Working with vines and herbs; own 2 x 2 m plot; test the validity of garden practices; make oil infusions).</p>	<p>The functional areas of the body in relation to consciousness and symmetry; The relationship of organic life to consciousness, health and well-being are considered.</p> <p>Work with trees and their care, train espalier, prune; identify and care for trees, learn how to graft; learn about coppicing; propagate native trees; make and use tree paste.</p>
Chemical Sciences	<p>Combustion processes from the burning of plant material; calcination of limestone and the smelting of ores are related to acid and base.</p>	<p>The substances of nutrition in connection to body substance. The role of high fiber carbohydrates, sugars, proteins and fats.</p> <p>Iron production.</p>	<p>The chemical transformations of plant substances e.g. sugar to alcohols, acetic acids, esters, and ethers. Fermentation, distillation, rectification, vinegar making, soap making and steam distillation.</p>	<p>Salt chemistry: build an overview of salt - its role in civilization, as a landscape builder; its extent in the sea and its role within our body fluids. The polarity of dissolving and crystallization. Salt, are the origin of acids and bases, the reason for the salt names and formulae. Ecological importance in dry land salinity, the Murray River and acid rain.</p>
Earth and Space Sciences	<p>The role of environment in various indigenous communities e.g. the Ring of Fire of Polynesia and the link between lifestyle and environment.</p>	<p>The role of warmth in simple weather processes – the onshore breeze and the sea breeze; heating and cooling extremes in deserts in contrast to the ocean.</p>	<p>The forces both within and above the Earth's crust - effect stratigraphy, rock types, volcanism, glaciations, earthquakes, and the cross structure of the alpine mountain ranges across the Earth.</p>	<p>The Earth as an integrated system : study the vertical and horizontal movements in the layers of the earth; study the currents in the waters and the atmosphere, from the lithosphere to the stratosphere; study the mantle currents of the earth to gain an understanding of plate tectonics.</p>

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Science Understanding				
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Physical Sciences	Phenomena of acoustics, optics and warmth are related to mechanical causes e.g. tone and vibration. Galvanic electricity, simple electric circuits, magnet fields and how they interact; simple machines	Acoustics laws in different mediums –air and water as media for sound. Warmth acts in the atmosphere via conduction, convection and radiation. Mechanics is taken tom a study of Hydraulics and Pneumatics. The relationship between electricity and magnetism has created much of what we use in the modern world with the electromotor.	Telephony and the Combustion Engine. How the human voice is transmitted and received. How heated gases produce an immense force which has driven our industrial society. Applications of Heat Technologies - the workhorses of our modern civilization. Engine assembly.	Mechanics, kinetics, statics and dynamics are an exact and mathematically based physics, which allow the prediction of the ways that movement occurs in the world and how materials behave. Integration of electromagnetism and circuit theory and mathematics to design, build and test a 4 bit binary adder.

Science and Human Endeavour				
	Year 7	Year 8	Year 9	Year 10
Nature and Development of Science	Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people’s understanding of the world. Science knowledge can develop through collaboration and connecting ideas across the disciplines of science		Scientific understanding, including models and theories, are contestable and are refined over time through a process of review by the scientific community Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries.	
Use and Influence of Science	Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations. Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management. People use understanding and skills from across the disciplines of science in their occupations.		People can use scientific knowledge to evaluate whether they should accept claims, explanations or predictions. Advances in science and emerging sciences and technologies can significantly affect people’s lives, including generating new career opportunities. The values and needs of contemporary society can influence the focus of scientific research.	

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Science Inquiries and Skills				
	Year 7	Year 8	Year 9	Year 10
Questioning and Predicting	Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge.		Formulate questions or hypotheses that can be investigated scientifically	
Planning and Conducting	Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed. In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task.		Plan, select and use appropriate investigation methods, including field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods. Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data.	
Processing and Analysing Data and Information	Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships. Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions.		Analyse patterns and trends in data, including describing relationships between variables and identifying inconsistencies. Use knowledge of scientific concepts to draw conclusions that are consistent with evidence.	
Evaluating	Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method Use scientific knowledge and findings from investigations to evaluate claims		Evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data Critically analyse the validity of information in secondary sources and evaluate the approaches used to solve problems.	
Communicating	Communicate ideas, findings and solutions to problems using expanded vocabulary gained through the lessons.		Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations.	