**AUSVELS : Australian SCIENCE Curriculum, F-10:**

**Overarching ideas:** Patterns, order & organization; Form and function; Stability and change; Scale and Measurement; Matter and energy; Systems

There are **three strands** which are to be taught in an integrated way. The order & detail in which content descriptions are organized in to learning programs are decisions to be made by the teacher.

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| **Science Understanding** – content described by year level | **Science as Human Endeavour** – content described in 2 year bands | **Science Inquiry Skills** – content described in 2 year bands |
| **Sub strands:**Biological sciencesChemical sciencesEarth and Space sciencesPhysical sciences | **Sub strands:**Nature and development of scienceUse and influence of science | **Sub strands:**Questioning and predictingPlanning and conductingProcessing and analysing data and informationEvaluatingCommunicating |

**Year/Level 7 SCIENCE Students:**

* Explore the diversity of life on Earth & develop their understanding of the role of classification.
* Use & develop models such as food chains, food webs & the water cycle to represent & analyse the flow of energy & matter through ecosystems & the impacts of changing components within them.
* Consider the interaction between multiple forces when explaining motion.
* Explore the notion of renewable and non-renewable resources & how this classification depends of the timescale considered.
* Investigate relationships in the Earth, sun, moon system & use models to predict & explain events.
* Make accurate measurements & control variables to analyse relationships between system components + explore & explain these through increasingly complex representations.

\*This document intends to assist teachers in their implementation of the Australian curriculum through AUSVELS– it combines description and elaboration statements. Teachers are advised to consult the online documentation to clarify further detail for themselves. The ‘AusVELS’ is the official documentation for Victorian schools.

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| **Science understanding:** | **Science as Human Endeavour:** | **Science Inquiry Skills:** |
| **Biological sciences:**There are differences within and between groups of organisms; classification helps organise this diversity (ACSSU111) * considering the reasons for classifying such as identification and communication
* grouping a variety of organisms on the basis of similarities and differences in particular features
* considering how biological classifications have changed over time
* classifying using hierarchical systems such as kingdom, phylum, class, order, family, genus, species
* using scientific conventions for naming species
* using provided keys to identify organisms surveyed in a local habitat

Interactions between organisms can be described in terms of food chains and food webs; human activity can affect these interactions (ACSSU112)  **ã** * using food chains to show feeding relationships in a habitat
* constructing and interpreting food webs to show relationships between organisms in an environment
* classifying organisms of an environment according to their position in a food chain
* recognising the role of microorganisms within food chains and food webs
* investigating the effect of human activity on local habitats, such as deforestation, agriculture or the introduction of new species
* exploring how living things can cause changes to their environment and impact other living things, such as the effect of cane toads
* researching specific examples of human activity, such as the use of fire by traditional Aboriginal people and the effects of palm oil harvesting in Sumatra and Borneo

**Chemical sciences:**Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques (ACSSU113)* recognising the differences between pure substances and mixtures and identifying examples of each
* identifying the solvent and solute in solutions
* investigating and using a range of physical separation techniques such as filtration, decantation, evaporation, crystallisation, chromatography and distillation
* exploring and comparing separation methods used in the home

**Earth and space sciences:**Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon (ACSSU115)* investigating natural phenomena such as lunar and solar eclipses, seasons and phases of the moon
* comparing times for the rotation of Earth, the sun and moon, and comparing the times for the orbits of Earth and the moon
* modelling the relative movements of the Earth, sun and moon and how natural phenomena such as solar and lunar eclipses and phases of the moon occur
* explaining why different regions of the Earth experience different seasonal conditions

Some of Earth’s resources are renewable, but others are non­renewable (ACSSU116) * considering what is meant by the term ‘renewable’ in relation to the Earth’s resources
* considering timescales for regeneration of resources
* comparing renewable and non­renewable energy sources, including how they are used in a range of situations

Water is an important resource that cycles through the environment (ACSSU222) * considering the water cycle in terms of changes of state of water
* investigating factors that influence the water cycle in nature
* exploring how human management of water impacts on the

 water cycle**Physical sciences:**Change to an object’s motion is caused by unbalanced forces acting on the object (ACSSU117)* investigating the effects of applying different forces to familiar objects
* investigating common situations where forces are balanced, such as stationary objects, and unbalanced, such as falling objects
* investigating a simple machine such as lever or pulley system

Earth’s gravity pulls objects towards the centre of the Earth (ACSSU118)* exploring how gravity affects objects on the surface of Earth
* considering how gravity keeps planets in orbit around the

 sun | **Nature & development of Science:**Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people’s understanding of the world (ACSHE119)* investigating how advances in telescopes and space probes have provided new evidence about space
* researching different ideas used in the development of models of the solar system developed by scientists such as Copernicus, Khayyám and Galileo
* researching developments in the understanding of astronomy, such as the predictions of eclipses and the calculation of the length of the solar level by Al-Battani in the tenth century

Science knowledge can develop through collaboration and connecting ideas across the disciplines of science (ACSHE223)* considering how water use and management relies on knowledge from different areas of science, and involves the application of technology
* identifying the contributions of Australian scientists to the study of human impact on environments and to local environmental management projects
* investigating how land management practices of Aboriginal and Torres Strait Islander peoples can help inform sustainable management of the environment
* studying transnational collaborative research in the Antarctic
* recognising that traditional and Western scientific knowledge can be used in combination to care for Country and Place

**Use & 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 (ACSHE120) * relating regulations about wearing seatbelts or safety helmets to knowledge of forces and motion
* considering issues relating to the use and management of water within a community
* considering decisions made in relation to the recycling of greywater and blackwater
* considering how human activity in the community can have positive and negative effects on the sustainability of ecosystems
* investigating ways to control the spread of the cane toad

Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management (ACSHE121) * investigating everyday applications of physical separation techniques such as filtering, sorting waste materials, reducing pollution, extracting products from plants, separating blood products and cleaning up oil spills
* investigating how advances in science and technology have been applied to the treatment of water in industrial and household systems
* investigating how Aboriginal and Torres Strait Islander knowledge is being used to inform scientific decisions, for example care of waterways
* researching the different scientific responses to the rabbit plagues in Australian agricultural areas

People use understanding and skills from across the disciplines of science in their occupations (ACSHE224)* recognising that water management plays a role in areas such as farming, land management and gardening
* investigating how separation techniques are used in the food and wine industries
* considering how seasonal changes affect people in a variety of activities such as farming
* considering how sports scientists apply knowledge of forces in order to improve performance
 | **Questioning & predicting:**Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS124)* working collaboratively to identify a problem to investigate
* recognising that the solution of some questions and problems requires consideration of social, cultural, economic or moral aspects rather than or as well as scientific investigation
* using information and knowledge from previous investigations to predict the expected results from an investigation

**Planning & conducting:**Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (ACSIS125)* working collaboratively to decide how to approach an investigation
* Learning and applying specific skills and rules relating to the safe use of scientific equipment
* identifying whether the use of their own observations and experiments or the use of other research materials is appropriate for their investigation
* developing strategies and techniques for effective research using secondary sources, including use of the internet

In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task (ACSIS126)* recognising the differences between controlled, dependent and independent variables
* using a digital camera to record observations and compare images using information technologies
* using specialised equipment to increase the accuracy of measurement within an investigation

**Processing & analyzing data & information:**Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships, including using digital technologies as appropriate (ACSIS129)* understanding different types of graphical and physical representation and considering their advantages and disadvantages
* using spreadsheets to aid the presentation and simple analysis of data
* describing the trends shown in collected data

Summarise data, from students’ own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions (ACSIS130)* using diagrammatic representations to convey abstract ideas and to simplify complex situations
* comparing and contrasting data from a number of sources in order to create a summary of collected data
* identifying data which provides evidence to support or negate the hypothesis under investigation
* referring to relevant evidence when presenting conclusions drawn from an investigation

**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 (ACSIS131)* discussing investigation methods with others to share ideas about the quality of the inquiry process
* identifying and considering indicators of the quality of the data when analysing results
* suggesting improvements to inquiry methods based on experience

Use scientific knowledge and findings from investigations to evaluate claims (ACSIS132)* using the evidence provided by scientific investigations to evaluate the claims or conclusions of their peers

**Communicating:**Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate (ACSIS133)* presenting the outcomes of research using effective forms of representation of data or ideas and scientific language that is appropriate for the target audience
* using digital technologies to access information and to communicate and collaborate with others on and off site
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| **Year 7 Achievement Standard:**By the end of Level 7, students describe techniques to separate pure substances from mixtures. They represent and predict the effects of unbalanced forces, including Earth’s gravity, on motion. They explain how the relative positions of the Earth, sun and moon affect phenomena on Earth. They analyse how the sustainable use of resources depends on the way they are formed and cycle through Earth systems. They predict the effect of environmental changes on feeding relationships and classify and organise diverse organisms based on observable differences. Students describe situations where scientific knowledge from different science disciplines has been used to solve a real­world problem. They explain how the solution was viewed by, and impacted on, different groups in society.Students identify questions that can be investigated scientifically. They plan fair experimental methods, identifying variables to be changed and measured. They select equipment that improves fairness and accuracy and describe how they considered safety. Students draw on evidence to support their conclusions. They summarise data from different sources, describe trends and refer to the quality of their data when suggesting improvements to their methods. They communicate their ideas, methods and findings using scientific language and appropriate representations. |

Cross-curriculum priorities to be included in all learning areas: Aboriginal and Torres Strait Islander histories and cultures (); Asia and Australia’s engagement with Australia (ã ); Sustainability ()

Reference : <http://ausvels.vcaa.vic.edu.au/> This grid is an adaption of the information from the VCAA site to create a visual representation to assist teachers.