**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 6 SCIENCE Students:**

* Explore how changes can be classified in different ways.
* Learn about the transfer and transformations of electricity & develop and understanding of energy flows through systems.
* Link experiences of electric circuits as a system at one scale, to generation of electricity from a variety of sources at another scale & consider links between these systems.
* Develop a view of the Earth as a dynamic system, in which changes in one aspect can impact on other aspects & see that the growth and survival of living things are dependent on matter and energy flows within a larger system.
* See the roles of variables in measuring changes and learn to look for patterns and relationships between variables & develop explanations for the patterns observed by drawing on evidence gathered.

\*This document intends to assist teachers in their implementation of the Australian curriculum through AUSVELS– it combines description and elaboration statements. The blue elaborations are examples of how the learning can be achieved; not a list of tasks that have to be done. 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:**The growth and survival of living things are affected by the physical conditions of their environment (ACSSU094)* investigating how changing the physical conditions for plants impacts on their growth and survival such as salt water, use of fertilizers and soil types
* observing the growth of fungi such as yeast and bread mould in different conditions
* researching organisms that live in extreme environments such as Antarctica or a desert
* considering the effects of physical conditions causing migration and hibernation

**Chemical sciences:**Changes to materials can be reversible, such as melting, freezing, evaporating; or irreversible, such as burning and rusting (ACSSU095) * describing what happens when materials are mixed
* investigating the solubility of common materials in water
* investigating the change in state caused by heating and cooling of a familiar substance
* investigating irreversible changes such as rusting, burning and cooking
* exploring how reversible changes can be used to recycle materials

**Earth and space sciences:**Sudden geological changes or extreme weather conditions can affect Earth’s surface (ACSSU096) **ã*** investigating major geological events such as earthquakes, volcanic eruptions and tsunamis in Australia, the Asia region and throughout the world
* recognizing that earthquakes can cause tsunamis
* describing how people measure significant geological events
* exploring ways that scientific understanding can assist in natural disaster management to minimize both long- and short-term effects
* considering the effects of drought on living and non-living aspects of the environment

**Physical sciences:**Electrical circuits provide a means of transferring and transforming electricity (ACSSU097)* recognizing the need for a complete circuit to allow the flow of electricity
* investigating different electrical conductors and insulators
* exploring the features of electrical devices such as light globes and switches

Energy from a variety of sources can be used to generate electricity (ACSSU219)* investigating how moving air and water can turn turbines to generate electricity
* investigating the use of solar panels
* considering whether an energy source is sustainable
 | **Nature & development of Science:**Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena (ACSHE098)* investigating how knowledge about the effects of using the Earth’s resources has changed over time
* describing how understanding of the causes and effects of major natural events has changed as new evidence has become available
* investigating the use of electricity, including predicting the effects of changes to electric circuits
* considering how gathering evidences helps scientists to predict the effect of major geological or climatic events

Important contributions to the advancement of science have been made by people from a range of cultures(ACSHE099) **ã*** investigating how people from different cultures have used sustainable sources or energy, for example water and solar power
* exploring institutions and locations where contemporary Australian scientists conduct research on catastrophic natural events
* learning how Aboriginal and Torres Strait Islander knowledge, such as the medical and nutritional properties of Australian plants, is being used as part of the evidence base for scientific advances
* investigating the development of earthquakes measurements from the Chinese invention of the seismograph in the second century

**Use & influence of science:**Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples’ lives (ACSHE100)  **ã*** researching the scientific work involved in global disaster alerts and communication, such as cyclone, earthquake and tsunami alerts
* investigating how electrical energy is generated in Australia and around the world
* researching the use of methane generators in Indonesia
* considering how electricity and electrical appliances have changed the way some people live

Scientific knowledge is used to inform personal and community decisions (ACSHE220) * considering how personal and community choices influence our use of sustainable sources of energy
* investigating how understanding of catastrophic natural events helps in planning for their early detection and minimising their impact
* recognizing that science can inform choices about where people live and how they manage natural disasters
* considering how guidelines help to ensure the safe use of electrical devices
* discussing the use of electricity and the conservation of sources of energy
 | **Questioning & predicting:**With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be (ACSIS232) * refining questions to enable scientific investigation
* asking questions to understand the scope or nature of a problem
* applying experience from previous investigations to predict the outcomes of investigations in new contexts

**Planning & conducting:**With guidance, plan appropriate investigation methods to answer questions or solve problems (ACSIS103)* following a procedure to design an experimental or field investigation
* discussing methods chosen with other students , and refining methods accordingly
* considering which investigation methods are most suited to answer a particular question or solve a problem

Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate (ACSIS104) * using familiar measurements such as grams, seconds and metres and developing the use of standard multipliers such as kilometres and millimetres
* using the idea of an independent variable (*note: this terminology does not need to be used at this stage)* as something being investigated by changing it and measuring the effect of this change
* using digital technologies to make accurate measurements and to record data

Use equipment and materials safely, identifying potential risks (ACSIS105)* discussing possible hazards involved in conducting investigations, and how these risks can be reduced

**Processing & analyzing data & information:**Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (ACSIS107)* exploring how different representations can be used to show different aspects of relationships, processes or trends
* using digital technologies to construct representations, including dynamic representations

Compare data with predictions and use as evidence in developing explanations (ACSIS221)* sharing ideas as to whether observations match predictions, and discussing possible reasons for predictions being incorrect
* discussing the difference between data and evidence
* referring to evidence when explaining the outcomes of an investigation

**Evaluating:**Suggest improvements to the methods used to investigate a question or solve a problem (ACSIS108)* discussing improvements to the methods used, and how these methods would improve the quality of the data obtained

**Communicating:**Communicate ideas, explanations and processes in a variety of ways, including multimodal texts (ACSIS110)* discussing the best way to communicate science ideas and what should be considered when planning text
* using a variety of communication modes, such as reports, explanations, arguments, debates and procedural accounts to communicate science ideas
* using labelled diagrams, including cross-sectional representations, to communicate ideas and processes within multi-modal texts
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| **Level 6 Achievement Standard:**By the end of Level 6, students compare and classify different types of observable changes to materials. They analyse requirements for the transfer of electricity and describe how energy can be transformed from one form to another to generate electricity. They explain how natural events cause rapid change to the Earth’s surface. They describe and predict the effect of environmental changes on individual living things. Students explain how scientific knowledge is used in decision making and identify contributions to the development of science by people from a range of cultures.Students follow procedures to develop investigable questions and design investigations into simple cause-and-effect relationships. They identify variables to be changed and measured and describe potential safety risks when planning methods. They collect, organise and interpret their data, identifying where improvements to their methods or research could improve the data. They describe and analyse relationships in data using graphic representations and construct multimodal texts to communicate ideas, methods and findings. |

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.