**Structure of Australian SCIENCE Curriculum, F-10:**

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 – the main points are the same, with variations in the elaborating examples | **Science Inquiry Skills** – content described in 2 year bands– this is basically the same as for year 7 |
| **Sub strands:**  Biological sciences  Chemical sciences  Earth and Space sciences  Physical sciences | **Sub strands:**  Nature and development of science  Use and influence of science | **Sub strands:**  Questioning and predicting  Planning and conducting  Processing and analysing data and information  Evaluating  Communicating |

**Year 8 SCIENCE Students:**

* Are introduced to cells as microscopic structures that explain macroscopic properties of living systems.
* Link form & function at a cellular level & explore the organization of body systems in terms of flows of matter between interdependent organs.
* Explore changes in matter at a particle level, & distinguish between chemical & physical change.
* Begin to classify different forms of energy, & describe the role of energy in causing change in systems, including the role of heat & kinetic energy in the rock cycle.
* Use experimentation to isolate relationships between components in systems & explain these relationships through increasingly complex representations.
* Make predictions & propose explanations, drawing on evidence to support their views.

\*This document intends to assist teachers in their implementation of the Australian curriculum – it is merely an attempt to understand the document at this time – it combines description and elaboration statements. Teachers are advised to consult the online documentation to clarify further detail for themselves. The ‘AusVELS’ to be released during 2011 will be the official documentation for Victorian schools.

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| **Science understanding:** | **Science as Human Endeavour:** | **Science Inquiry Skills:** |
| **Biological sciences:**   * Cells are the basic units of living things & have specialized structures & functions – *examine cells using a light microscope, digital technology or simulation; distinguish plant cells from animal or fungal; identify structures within cells & describe function; recognise single cell organisms; cell division for reproduction; describe mitosis as cell division fro growth & repair* * Multi-cellular organisms contain systems of organs that carry out specialized functions that enable them to survive & reproduce – *identify organs & overall function of a system of a multicellular organism in supporting the life processes; describe organ structures & functions; examine specialised cells & tissues; compare eg digestive systems in herbivores & carnivores, respiratory in fish & mammals; distinguish between sexual & asexual reproduction; compare reproductive systems of organisms*   **Chemical sciences:**   * The properties of the different states of matter can be explained in terms of the motion & arrangement of particles – *model particles in solids, liquids & gases; link energy of particles to temperature changes* * Differences between elements, compounds & mixtures can be described at particle level – *recognize that elements & simple compounds can be represented by symbols & formulas; locate elements in periodic table* * Chemical change involves substances reacting to form new substances – *identify chemical & physical changes; identify evidence that chemical change has occurred; investigate simple reactions; chemical properties eg flammability, ability to corrode & affects on use*   **Earth and space sciences:**   * Sedimentary, igneous & metamorphic rocks contain minerals & are formed by processes that occur within Earth over a variety of timescales – *stages in formation of types of rock, including timescales; common rock types using key observable & chemical properties; recognise that rocks are a collection of different minerals; forces & energy in rock formation; rocks & minerals as valuable resources*   **Physical sciences:**   * Energy appears in different forms including movement, heat & potential energy, & causes change within systems– *recognise kinetic energy in moving bodies; gravitational, chemical & elastic energy as stored, potential energy; investigate different forms of energy in terms of effects, and energy transference; heat energy as by-product of energy transfer eg car brakes or light globes; use flow diagrams to illustrate changes between forms of energy* | **Nature & development of Science:**   * Science changes as new evidence becomes available, & some discoveries significantly change people’s understanding of the world – *investigate developments in understanding cells & impacts on health & medicine; how particle theory has changed understanding of nature of matter, & impact of technology; how idea of elements has developed over time; development of microscope & impact on understanding cells & functions & division* * Science knowledge can develop through collaboration & connecting ideas across the disciplines of science – *investigate how knowledge of extraction & location of minerals relies on expertise across different sciences; consider how advances in technology & scientific understanding, enables medical science to replace or repair organs; research use of reproductive technologies & how developments rely on knowledge across sciences*   **Use & influence of science:**   * Science & technology contribute to finding solutions to a range of contemporary issues, which may impact of other areas of society & involve ethical considerations – *investigate requirements & design of household recycling systems; strategies to maintain local environments; how energy efficiency can reduce consumption; development of vehicles including solar powered vehicles; ethical issues around organ transplantation* * Science understanding influences the development of practices in areas of human activity such as industry, agriculture, marine & terrestrial resource management – *describe how technologies improve yields & sustainability; investigate how aboriginals use burning to promote new growth, attract animals, afford easier hunting & gathering; describe impact of plant cloning in horticulture, fruit production & vineyards; role of science / technology in economies / communities in Asia-Pacific eg car manufacture, earthquake prediction, electronic optics* * People use understanding & skills from across the disciplines of science in their occupations – *role of environmental / ecosystem knowledge in various occupations; how engineers improve energy efficiencies; cell & division understanding in disease treatment & control; new materials eg synthetic fibres, heat resistant plastics & pharmaceuticals* | **Questioning & predicting:**   * Identify questions & problems that can be investigated scientifically & make predictions based on scientific knowledge – *work collaboratively to identify problems to investigate; use prior knowledge to predict results*   **Planning & conducting:**   * Collaboratively & individually plan & conduct a range of investigations types, including fieldwork & experiments, ensuring safety & ethical guidelines are followed – *develop strategies & techniques for effective research using secondary resources, including the internet; work in groups to decide how to approach an investigation* * In fair tests, measure & control variables, & select equipment to collect data with accuracy appropriate to the task – *recognise difference between controlled, dependent & independent variables; learn & apply safe equipment use skills & rules; use specialised equipment to increase accuracy of measurement; use digital camera to record observations & compare images*   **Processing & analyzing data & information:**   * Construct & use a range of representations, including graphs, keys & models to signal & analyse patterns or relationships, including digital methods – *spreadsheets to aid simple analysis; consider advantages & disadvantages of different depictions* * Summarise data, from own investigations & secondary sources, use scientific understanding to identify relationships & draw conclusions – *use diagrams to convey abstract ideas & simplify complex situations*   **Evaluating:**   * Reflect on the method used, including evaluating the quality of data & identify improvements in method – *discuss methods & evaluations; suggest improvements based on experience* * Use scientific knowledge & findings from investigations to evaluate claims – *identify where science is the basis of conclusions*   **Communicating:**   * Communicate ideas, findings & solutions to problems using scientific language & representations using digital technologies as appropriate – *access, communicate, collaborate, on & off site* |