**Sample Course Outline**

Integrated Science

General Year 11

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# Sample course outline

# Integrated Science – General Year 11

## Unit 1

#### Semester 1 – Unit 1

Science Inquiry Skills align with the Science Understanding and Science as a Human Endeavour content of the unit and are integrated into the learning experiences.

The use of scientific knowledge, as described in Science as a Human Endeavour, is integrated into the learning experiences and assessment of the unit.

| **Week** | **Key teaching points** |
| --- | --- |
| 1 | **Earth systems*** The Earth’s spheres
* hydrosphere
* lithosphere
* atmosphere
* Natural resources for life processes
* photosynthesis and respiration
* synthesis of building blocks for life (carbohydrates, fats, proteins)
 |
| 2–4 | * Biogeochemical cycles
* water cycle
* carbon cycle
* nitrogen cycle
* Impacts on biogeochemical cycles
* natural processes (drought, fire, volcanic activity)
* human activities (deforestation, pollution)

**Commence Task 4:** Extended response – Eutrophication: An unintentional impact**Task 1:** Test – Earth systems |
| 5–7 | **Biological systems*** Cell structure and function
* Hierarchical organisation of organisms
* cells
* tissues
* organs
* systems
* Structure and function of 2–3 plant and/or animal systems

**Task 2:** Science Inquiry: Practical – Microscopy: Observing cells |
| 8–9 | * Dysfunction/disease (changes in systems)
* susceptibility
* resistance
* Case study: Variation assists survival – vaccination and antibiotic resistance

Task 3: Test – Biological systemsTask 4: Extended response – Eutrophication: An unintentional impact |
| 10–11 | **Ecosystems and sustainability*** Interrelations between organisms and biogeochemical cycles to obtain requirements for life
* atmospheric gases
* water
* nitrogen
* Interaction between communities and the physical environment
* classifying ecosystems
* Australian ecosystems

**Task 5:** Science Inquiry: Investigation – Monitoring a local ecosystem |
| 12–13 | **Continuity and change*** Types of reproduction
* asexual and sexual
* advantages/disadvantages for survival
* Variation
* importance of variation
* cause of variation

**Task 6:** Science Inquiry: Practical – The importance of variation |
| 14–15 | * Adaptations
* types of adaptations (structural, physiological, behavioural)
* examples of Australian plant and animal adaptations

**Task 7:** Test – Ecosystems and sustainability and continuity and change |

This course outline has be written without a context. Where content is similar in Year 11 and 12 a different context should be used to teach the content.

#### Semester 2 – Unit 2

Science Inquiry Skills align with the Science Understanding and Science as a Human Endeavour content of the unit and are integrated into the learning experiences.

The use of scientific knowledge, as described in Science as a Human Endeavour, is integrated into the learning experiences and assessment of the course.

| **Week** | **Key teaching points** |
| --- | --- |
| 1–2 | **Atomic structure*** Atomic structure can be modelled
* Models have changed over time as new experimental evidence is gathered
* Subatomic particles
* nucleus (protons and neutrons)
* electron shells
* calculate numbers of subatomic particles (mass number atomic number)
* Elements, compounds and mixtures
* chemical symbols
* differences between elements, compounds and mixtures
* Properties of materials
* physical and chemical properties of substances determines use

**Task 8:** Science Inquiry: Practical – Properties of materials |
| 3–5 | **Chemical reactions*** conservation of mass during a chemical reaction
* chemical reactions can be represented using word equations
* endothermic and exothermic reactions

**Task 9:** Test – Atomic structure and chemical reactions |
| 6–7 | **Mixtures and solutions*** Types of mixtures
* solutions
* suspensions
* colloids (e.g. emulsions, foams, sol/gels, aerosols)
* Separating mixtures
* mixtures can be separated by physical processes
* separating insoluble substances (e.g. decantation, filtration, centrifuge)
* separating soluble substances (e.g. evaporation, distillation, chromatography)

**Task 10:** Science Inquiry: Investigation – Investigating mixtures |
| 8 | **Motion and forces*** Forces
* contact and non-contact forces
* measuring forces
* balanced and unbalanced forces
* free body diagrams showing the forces acting on objects
 |
| 9 | * Motion
* vector and scalar quantities
* distance/displacement
* speed/velocity
* acceleration
 |
| 10–12 | * Newton’s Laws of Motion
* examples of each law in action

**Task 11:** Test – Motion and forces**Task 12:** Extended response – Forces in action |
| 13 | **Energy*** Kinetic
* types of kinetic energy
* examples of kinetic energy transfers
* Potential
* types of potential energy
* identify when energy in an object changes between potential and kinetic

**Task 13:** Science Inquiry: Practical – Kinetic and potential energy |
| 14–15 | * Heat
* kinetic theory of matter
* heat energy transfer (conduction, convection, radiation)

**Task 14:** Test – Energy |

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