



SAMPLE COURSE OUTLINE

INTEGRATED SCIENCE GENERAL YEAR 11

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Any resources such as texts, websites and so on that may be referred to in this document are provided as examples of resources that teachers can use to support their learning programs. Their inclusion does not imply that they are mandatory or that they are the only resources relevant to the course.

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 <ul style="list-style-type: none"> The Earth's spheres <ul style="list-style-type: none"> hydrosphere lithosphere atmosphere Natural resources for life processes <ul style="list-style-type: none"> photosynthesis and respiration synthesis of building blocks for life (carbohydrates, fats, proteins)
2–4	<ul style="list-style-type: none"> Biogeochemical cycles <ul style="list-style-type: none"> water cycle carbon cycle nitrogen cycle Impacts on biogeochemical cycles <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Cell structure and function Hierarchical organisation of organisms <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Dysfunction/disease (changes in systems) <ul style="list-style-type: none"> susceptibility resistance Case study: Variation assists survival – vaccination and antibiotic resistance Task 3: Test – Biological systems Task 4: Extended response – Eutrophication: An unintentional impact
10–11	Ecosystems and sustainability <ul style="list-style-type: none"> Interrelations between organisms and biogeochemical cycles to obtain requirements for life <ul style="list-style-type: none"> atmospheric gases water nitrogen Interaction between communities and the physical environment <ul style="list-style-type: none"> classifying ecosystems Australian ecosystems

Week	Key teaching points
	Task 5: Science Inquiry: Investigation – Monitoring a local ecosystem
12–13	Continuity and change <ul style="list-style-type: none"> • Types of reproduction <ul style="list-style-type: none"> ▪ asexual and sexual ▪ advantages/disadvantages for survival • Variation <ul style="list-style-type: none"> ▪ importance of variation ▪ cause of variation Task 6: Science Inquiry: Practical – The importance of variation
14–15	<ul style="list-style-type: none"> • Adaptations <ul style="list-style-type: none"> ▪ 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 been 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 <ul style="list-style-type: none"> Atomic structure can be modelled Models have changed over time as new experimental evidence is gathered Subatomic particles <ul style="list-style-type: none"> nucleus (protons and neutrons) electron shells calculate numbers of subatomic particles (mass number atomic number) Elements, compounds and mixtures <ul style="list-style-type: none"> chemical symbols differences between elements, compounds and mixtures Properties of materials <ul style="list-style-type: none"> physical and chemical properties of substances determines use Task 8: Science Inquiry: Practical – Properties of materials
3–5	Chemical reactions <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Types of mixtures <ul style="list-style-type: none"> solutions suspensions colloids (e.g. emulsions, foams, sol/gels, aerosols) Separating mixtures <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Forces <ul style="list-style-type: none"> contact and non-contact forces measuring forces balanced and unbalanced forces free body diagrams showing the forces acting on objects
9	<ul style="list-style-type: none"> Motion <ul style="list-style-type: none"> vector and scalar quantities distance/displacement speed/velocity acceleration
10–12	<ul style="list-style-type: none"> Newton’s Laws of Motion <ul style="list-style-type: none"> examples of each law in action Task 11: Test – Motion and forces Task 12: Extended response – Forces in action
13	Energy <ul style="list-style-type: none"> Kinetic <ul style="list-style-type: none"> types of kinetic energy

Week	Key teaching points
	<ul style="list-style-type: none">▪ examples of kinetic energy transfers• Potential<ul style="list-style-type: none">▪ 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	<ul style="list-style-type: none">• Heat<ul style="list-style-type: none">▪ kinetic theory of matter▪ heat energy transfer (conduction, convection, radiation) Task 14: Test – Energy

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