



SAMPLE COURSE OUTLINE

INTEGRATED SCIENCE
GENERAL YEAR 12

Acknowledgement of Country

Kaya. The School Curriculum and Standards Authority (the Authority) acknowledges that our offices are on Whadjuk Noongar boodjar and that we deliver our services on the country of many traditional custodians and language groups throughout Western Australia. The Authority acknowledges the traditional custodians throughout Western Australia and their continuing connection to land, waters and community. We offer our respect to Elders past and present.

Copyright

© School Curriculum and Standards Authority, 2020

This document – apart from any third party copyright material contained in it – may be freely copied, or communicated on an intranet, for non-commercial purposes in educational institutions, provided that the School Curriculum and Standards Authority is acknowledged as the copyright owner, and that the Authority’s moral rights are not infringed.

Copying or communication for any other purpose can be done only within the terms of the *Copyright Act 1968* or with prior written permission of the School Curriculum and Standards Authority. Copying or communication of any third party copyright material can be done only within the terms of the *Copyright Act 1968* or with permission of the copyright owners.

Any content in this document that has been derived from the Australian Curriculum may be used under the terms of the [Creative Commons Attribution 4.0 International licence](#).

Disclaimer

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 12

Unit 3 and Unit 4

Semester 1 – Unit 3

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.

Week	Key teaching points
1	Earth systems/cycles in nature <ul style="list-style-type: none"> Ecosystem diversity <ul style="list-style-type: none"> Biosphere Biomes Australian ecosystems
2–3	<ul style="list-style-type: none"> Abiotic and biotic factors <ul style="list-style-type: none"> Abiotic factors (e.g. temperature, pH, salinity, light, water, atmospheric gases) Biotic factors (e.g. competition, habitat, disease, producers, consumers, decomposers) Commence Task 1: Science Inquiry: Investigation – Abiotic and biotic factors in a local ecosystem
4	<ul style="list-style-type: none"> Interaction between biotic and abiotic factors <ul style="list-style-type: none"> Biogeochemical cycling (e.g. transpiration, photosynthesis, respiration)
5	<ul style="list-style-type: none"> Energy transfer and transformation <ul style="list-style-type: none"> Producers, consumers, decomposers Food chains Trophic levels Food webs Complete Task 1: Science Inquiry: Investigation – Abiotic and biotic factors in a local ecosystem
6–8	Structure and function of biological systems <ul style="list-style-type: none"> Modes of interaction between species <ul style="list-style-type: none"> Competition Predations Symbiosis Factors affecting population density, community structure and composition <ul style="list-style-type: none"> Predator-prey relationships Competition Abundance Distribution Task 2: Test – Earth systems/cycles in nature, structure and function of biological systems Commence Task 3: Extended response – Bushfires: The beneficial, harmful and unintended consequences
9–10	Ecosystems and sustainability <ul style="list-style-type: none"> Population ecology <ul style="list-style-type: none"> Carrying capacity Population growth Population regulation (density dependent and density independent factors)
11–13	<ul style="list-style-type: none"> Biodiversity <ul style="list-style-type: none"> Genetic Species Ecosystem Changes in biodiversity due to <ul style="list-style-type: none"> Succession (natural changes over time)

Week	Key teaching points
	<ul style="list-style-type: none"> ▪ Location • Human impacts (habitat loss, degradation and fragmentation, species exploitation and introduced species) <ul style="list-style-type: none"> ▪ Social, economic, cultural and ethical considerations ▪ Beneficial/harmful/unintended consequences <p>Complete Task 3: Extended response – Bushfires: The beneficial, harmful and unintended consequences Task 4: Externally Set Task</p>
14–15	<p>Species continuity and change</p> <ul style="list-style-type: none"> • Natural selection <ul style="list-style-type: none"> ▪ Change in environment ▪ Variation in the population ▪ Survival of the fittest ▪ Adaptation <p>Task 5: Science Inquiry: Practical – Modelling natural selection</p>

Note: this course outline has been written without a context. Where content is similar in Years 11 and 12 a different context should be used to teach the content.

Semester 2 – Unit 4

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.

Week	Key teaching points
1–3	<p>Chemical reactions</p> <ul style="list-style-type: none"> • Properties of materials <ul style="list-style-type: none"> ▪ Physical and chemical properties of substances determine use • Chemical reactions can be represented using word equations <ul style="list-style-type: none"> ▪ Conservation of mass during a chemical reaction <p>Commence Task 6: Extended response – Properties of materials</p>
4–6	<ul style="list-style-type: none"> • Types of chemical reactions <ul style="list-style-type: none"> ▪ Combustion reactions ▪ Reactions with acids ▪ Reactions taking in energy (endothermic) ▪ Reactions giving out energy (exothermic) <p>Task 7: Science Inquiry: Investigation – Exothermic reactions</p>
7–8	<p>Mixtures and solutions</p> <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) <p>Task 8: Test – Chemical reactions, mixtures and solutions</p> <p>Complete Task 6: Extended response – Properties of materials</p>
9–10	<p>Motion and forces</p> <ul style="list-style-type: none"> • Forces <ul style="list-style-type: none"> ▪ Contact and non-contact forces ▪ Measuring forces • Motion <ul style="list-style-type: none"> ▪ Vector and scalar quantities ▪ Distance/displacement ▪ Speed/velocity ▪ Acceleration
11	<ul style="list-style-type: none"> • Newton’s Laws of Motion <ul style="list-style-type: none"> ▪ Examples of each law in action
12–13	<p>Energy</p> <ul style="list-style-type: none"> • Heat <ul style="list-style-type: none"> ▪ Kinetic theory of matter ▪ Heat energy transfer (conduction, convection, radiation) <p>Task 9: Science Inquiry: Investigation – Energy transfer</p>
14–15	<ul style="list-style-type: none"> • Kinetic <ul style="list-style-type: none"> ▪ Types of kinetic energy ▪ 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 <p>Task 10: Test – Motion, forces and energy</p>

Note: this course outline has been written without a context. Where content is similar in Years 11 and 12 a different context should be used to teach the content.