

Year 7 Australian Curriculum Achievement Standard:

Science Understanding:

By the end of Year 7, students describe techniques to separate pure substances from mixtures. They represent and predict the effects of unbalanced forces, including Earth’s gravity, on motion. They explain how the relative positions of Earth, the sun and moon affect phenomena on Earth. They analyse how the sustainable use of resources depends on the way they are formed and cycle through Earth systems. **They predict the effect of human and environmental changes on interactions between organisms and classify and organise diverse organisms based on observable differences.**

Science as Human Endeavour:

Students describe situations where scientific knowledge from different science disciplines and diverse cultures has been used to solve a real-world problem. They explain possible implications of the solution for different groups in society.

Science Inquiry Skills:

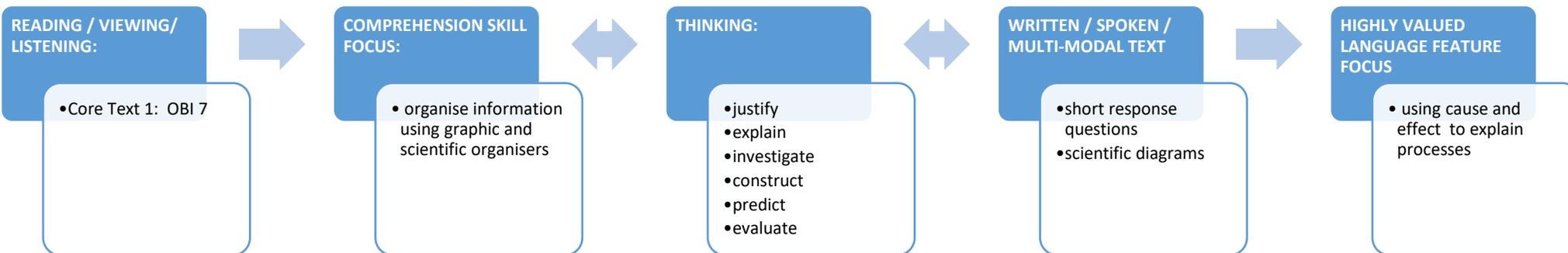
Students identify questions that can be investigated scientifically. They plan fair experimental methods, identifying variables to be changed and measured. They select equipment that improves fairness and accuracy and describe how they considered safety. **Students draw on evidence to support their conclusions. They summarise data from different sources, describe trends and refer to the quality of their data when suggesting improvements to their methods. They communicate their ideas, methods and findings using scientific language and appropriate representations.**

Unit Specific Information

Students will explore the diversity of life on Earth. They will develop their understanding of the role of classification in ordering and organising information based on observable differences. They will explore and explain feeding relationships using and developing models such as food chains and food webs. Using these models, students will analyse the flow food and nutrition through ecosystems and explore the impact of changing components within these systems. Students describe situations where scientific knowledge from different science disciplines has been used to solve a real-world problem. They explain how the solution was viewed by, and impacted on, different groups in society.

Assessment Details:

Mode	Assignment
Duration	3 x 70 min lessons
Conditions	Individual 500 words maximum Access to library resources
Dates	Term 1, Week 9



PRIORITY STANDARDS

		Thinking Routines : Comprehension and Cognitive	Communication
3	<p>Predict</p> <ul style="list-style-type: none"> • cause and effect links between changes in the environment/species abundance and ecosystem function <p>Evaluate</p> <ul style="list-style-type: none"> • the efficiency and validity of dichotomous and tabular keys • weaknesses in food webs 	<p>Justify</p> <ul style="list-style-type: none"> • cause and effect links between changes in the environment/species abundance and ecosystem function • characteristics used to create dichotomous and tabular keys • whether something is living or non-living 	
2	<p>Identify, analyse and classify organisms using</p> <ul style="list-style-type: none"> • food chains and food webs. • Construct food chains and food webs to represent and analyse feeding relationships in an environment using evidence 	<p>Explain</p> <ul style="list-style-type: none"> • feeding relationships between organisms • cause and effect links between changes in the environment/species abundance and ecosystem function • whether something is living or non-living <p>Construct using appropriate scientific conventions</p> <ul style="list-style-type: none"> • food chains and food webs • dichotomous and tabular keys 	

Learning Goals:

Strands and Sub-Strands	Australian Curriculum Content Descriptors	Kirwan High Learning Goals
Science Understanding		
Biological sciences	<ul style="list-style-type: none"> classification helps organise the diverse group of organisms (ACSSU111) 	<ul style="list-style-type: none"> Describe and explain the characteristics living organisms Analyse similarities and differences between diverse living organisms using observable evidence Classify living organisms, using similarities and differences, into groups using observable evidence Apply the modern hierarchical classification system OR dichotomous keys OR tabular keys to: organise living organisms OR identify unknown organisms
	<ul style="list-style-type: none"> Interactions between organisms, including the effects of human activities, can be represented by food chains and food webs (ACSSU112) 	<ul style="list-style-type: none"> Describe, explain, analyse and classify feeding relationships between organisms in an environment using food chains and food webs. Use food chains and webs to predict how human activity/environmental change can impact feeding relationships
Science as a Human Endeavour:		
Nature and development of science	<ul style="list-style-type: none"> Scientific Knowledge has changed peoples understanding of the world and is refined as new evidence becomes available (ACSHE119) 	<ul style="list-style-type: none"> Identify how understanding of human impacts on environments and food webs, has altered how we manage ecosystems
Use and influence of science	<ul style="list-style-type: none"> Solutions to contemporary issues that are found using science and technology may impact of other areas of society and may involve ethical considerations (ACSHE120) 	<ul style="list-style-type: none"> Explain how the result from managing the environment may impact related industries Researching the scientific responses and control of spread to invasive species, e.g. cane toad and rabbits
Science Inquiry Skills:		
Processing and analysing data and information	<ul style="list-style-type: none"> Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships in data using digital technologies as appropriate (AC SIS129) & (AC SIS144) 	<ul style="list-style-type: none"> construct dichotomous keys and tables to classify and organise living organisms using observable evidence Construct food chains and food webs to represent and analyse feeding relationships in an environment using evidence
Science Inquiry Skills: Communicating	<ul style="list-style-type: none"> Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions based on evidence (AC SIS130) & (AC SIS145) 	<ul style="list-style-type: none"> Summarise information from secondary sources Investigate the meaning of unknown terminology Use information and meaning to identify and explain feeding relationships

Possible Habit of Mind: Questioning and Problem Solving				
<p>Exploring Meaning of the HOM By the end of this unit students will be able to:</p> <ul style="list-style-type: none"> • <i>Have a questioning attitude</i> • <i>Know what data are needed</i> • <i>Developing questioning strategies to produce those data</i> • <i>Finding problems to solve</i> 	<p>Expanding Capacity for using the HOM By the end of this unit students will be able to:</p> <ul style="list-style-type: none"> • <i>Explain the logical steps needed to solve a problem and justify the answer/strategy used</i> 	<p>Increasing Alertness for the HOM By the end of this unit students will be able to:</p> <ul style="list-style-type: none"> • <i>Identify problems that need solving</i> • <i>Identify different ways to solve the problem</i> 	<p>Extending Values of the HOM By the end of this unit students will be able to:</p> <ul style="list-style-type: none"> • <i>Explain the impacts of identifying and solving problems that they encounter</i> 	<p>Building Commitment towards the HOM By the end of this unit students will be able to:</p> <ul style="list-style-type: none"> • <i>Motivate and assist others to identify and solve problems</i>
General Capabilities: This unit provides opportunities for students to engage in following capabilities:				
<p>Literacy</p> <ul style="list-style-type: none"> ✓ Comprehending texts through listening, reading and viewing ✓ Composing texts through speaking, writing and creating ✓ Text knowledge ✓ Grammar knowledge ✓ Word knowledge ✓ Visual knowledge <p>Numeracy</p> <ul style="list-style-type: none"> <input type="checkbox"/> Estimating and calculating with whole numbers ✓ Recognising and using patterns and relationships <input type="checkbox"/> Using fractions, decimals, percentages, ratios and rates <input type="checkbox"/> Using spatial reasoning <input type="checkbox"/> Interpreting statistical information <input type="checkbox"/> Using measurement 	<p>ICT</p> <ul style="list-style-type: none"> ✓ Applying social and ethical protocols and practices when using ICT ✓ Investigating with ICT ✓ Creating with ICT ✓ Communicating with ICT <input type="checkbox"/> Managing and operating ICT <p>Critical and creative thinking</p> <ul style="list-style-type: none"> ✓ Inquiring - identifying, exploring and organising information and ideas ✓ Generating ideas, possibilities and actions ✓ Reflecting on thinking and processes ✓ Analysing, synthesising and evaluating reasoning and procedures 	<p>Personal and social capability</p> <ul style="list-style-type: none"> ✓ Self-awareness ✓ Self-management ✓ Social awareness ✓ Social management <p>Ethical understanding</p> <ul style="list-style-type: none"> ✓ Understanding ethical concepts and issues ✓ Reasoning in decision making and actions ✓ Exploring values, rights and responsibilities <p>Intercultural understanding</p> <ul style="list-style-type: none"> ✓ Recognising culture and developing respect ✓ Interacting and empathising with others <input type="checkbox"/> Reflecting on intercultural experiences and taking responsibility 		
Cross Curriculum Priorities:				
<ul style="list-style-type: none"> ✓ Aboriginal and Torres Strait Islander histories and cultures 	<ul style="list-style-type: none"> ✓ Asia and Australia's engagement with Asia 	<ul style="list-style-type: none"> ✓ Sustainability 		
Differentiation [for small groups or individuals]:				
<ol style="list-style-type: none"> 1. Individualise formative assessment tools provided with Oxford Big Ideas 7 2. Include increased scaffolding around assigned formative assessment task where needed 3. Plan open-ended lesson tasks that require higher order thinking skills from more capable students 4. Make use of heterogeneous collaborative groups to gain different perspectives 5. Make use of homogeneous collaborative groups to tailor tiered questions 6. Attend to any individual work plan requirements 7. Collect and analyse student profiles for literacy and numeracy needs 				

8. Embed links to indigenous perspectives

Learning Sequence

Week	Day 1	Day 2	Day 3
2	<p>Establish routines and procedures</p> <p>Outline Units Year 7 science</p> <p>Set up notebooks</p> <p>Homework instructions</p> <p>Term goals and checkpoints</p>	<p>I can explain the difference between living and non-living things</p> <ul style="list-style-type: none"> Describe and explain the characteristics of living organisms Analyse similarities and differences between diverse living organisms using observable evidence <p>Critical Vocabulary: living organism, similarity, difference, cell, observable evidence, biotic, abiotic</p> <p>Strategies: MR.N.GREWW; Venn Diagram, Concept Map</p> <p>Engagement/ Enrichment:</p> <p>Resources:</p> <p>Extension: provide more challenging examples to classify, eg. Lightning, blood</p>	<p>I can justify whether something is living or not living</p> <ul style="list-style-type: none"> Describe and explain the characteristics living organisms Analyse similarities and differences between diverse living organisms using observable evidence <p>Strategies: MR.N.GREWW; Venn Diagram, Concept Map</p> <p>Critical Vocabulary: living organism, similarity, difference, cell, observable evidence, biotic, abiotic</p> <p>Engagement/ Enrichment:</p> <p>Resources:</p> <p>Extension: provide more challenging examples to classify, eg. Lightning, blood Advanced characteristics such as cells and DNA</p>
3 Swimming Carnival School photos	<p>I can write a scientific justification for whether something is living or not living</p> <ul style="list-style-type: none"> Identify links between skill of justifying an answer, and assessment criteria Identify times when we justify in everyday life Analyse an exemplar answer Describe and explain the characteristics living organisms 	<p>Why do we need to classify organisms? What types of classification are there? Why is it important to distinguish species?</p> <p>Practical, descriptive classification using dichotomous/tabular keys for guidebooks, identification etc.</p> <p>Scientific taxonomy</p> <ul style="list-style-type: none"> why species are an important level of classification. 	<p>Catch-up/extension lesson if not affected by carnival/photos</p>

	<ul style="list-style-type: none"> Analyse similarities and differences between diverse living organisms using observable evidence <p>Strategies: MR.N.GREWW; Venn Diagram, Concept Map</p> <p>Critical Vocabulary: living organism, similarity, difference, cell, observable evidence, biotic, abiotic</p> <p>Engagement/ Enrichment:</p> <p>Resources:</p> <p>Extension: provide more challenging examples to classify, eg. Lightning, blood</p>	<ul style="list-style-type: none"> The importance of consistent communication (why latin is used). What information is conveyed by each taxonomic level. Links to evolutionary history – use of critical (usually internal) characteristics <p>Strategies: Venn Diagram, Concept Map</p> <p>Critical Vocabulary: dichotomous key, kingdom, phylum, class, order, family, genus, species</p> <p>Engagement/ Enrichment:</p> <p>Resources:</p> <p>Extension: students research the classification of a species of their choice</p>	
4	<p>How can you use dichotomous/tabular keys and scientific classification to identify species? (+How to find the scientific classification of an organism).</p> <ul style="list-style-type: none"> Classify living organisms, using similarities and differences, into groups using observable evidence Apply the modern hierarchical classification system OR dichotomous keys OR tabular keys to: organise living organisms OR identify unknown organisms construct dichotomous keys and tables to classify and organise living organisms using observable evidence Use scientific terminology, dichotomous keys, factorial explanations, consequential explanations and evaluative text response to communicate ideas <p>Critical Vocabulary: kingdom, species, family, phylum, dichotomous key,</p>	<p>How do we create dichotomous/tabular keys?</p> <ul style="list-style-type: none"> Classify living organisms, using similarities and differences, into groups using observable evidence Apply the modern hierarchical classification system OR dichotomous keys OR tabular keys to: organise living organisms OR identify unknown organisms construct dichotomous keys and tables to classify and organise living organisms using observable evidence Use scientific terminology, dichotomous keys, to communicate ideas <p>Critical Vocabulary:</p>	<p>Prac – using and making dichotomous/tabular keys using species seen in the playground</p>

5	<p>How do we create dichotomous/tabular keys?</p> <ul style="list-style-type: none"> Classify living organisms, using similarities and differences, into groups using observable evidence Apply the modern hierarchical classification system OR dichotomous keys OR tabular keys to: organise living organisms OR identify unknown organisms construct dichotomous keys and tables to classify and organise living organisms using observable evidence Use scientific terminology, dichotomous keys to communicate ideas <p>Critical Vocabulary:</p>	<p>Why do we need to classify organisms? What types of classification are there? Why is it important to distinguish species?</p> <p>Practical, descriptive classification using dichotomous/tabular keys for guidebooks, identification etc.</p> <p>Scientific taxonomy</p> <ul style="list-style-type: none"> why species are an important level of classification. The importance of consistent communication (why latin is used). What information is conveyed by each taxonomic level. Links to evolutionary history – use of critical (usually internal) characteristics <p>Strategies: Venn Diagram, Concept Map</p> <p>Critical Vocabulary: dichotomous key, kingdom, phylum, class, order, family, genus, species</p> <p>Engagement/ Enrichment:</p> <p>Resources:</p> <p>Extension: students research the classification of a species of their choice</p>	
6	<p>Formative assessment – short test</p>	<p>How do species interact?</p> <ul style="list-style-type: none"> <i>Describe, explain, analyse and classify</i> feeding relationships between organisms in an environment using food chains and food webs. <i>Construct</i> food chains and food webs to represent and analyse feeding relationships in an environment using evidence <i>Summarise</i> information from secondary sources <i>Investigate</i> the meaning of unknown terminology Use information and meaning to <i>identify</i> and <i>explain</i> feeding relationships <p>Critical Vocabulary: environment, biotic, abiotic food chain, food web, producer, consumer, predator, prey, herbivore, carnivore, omnivore, trophic level, photosynthesis, phytoplankton, zooplankton</p>	<p>How do we construct a food chain?</p> <ul style="list-style-type: none"> <i>Describe, explain, analyse and classify</i> feeding relationships between organisms in an environment using food chains and food webs. <i>Construct</i> food chains and food webs to represent and analyse feeding relationships in an environment using evidence <i>Summarise</i> information from secondary sources <i>Investigate</i> the meaning of unknown terminology Use information and meaning to <i>identify</i> and <i>explain</i> feeding relationships <p>Critical Vocabulary: environment, biotic, abiotic food chain, food web, producer, consumer, predator, prey, herbivore, carnivore, omnivore, trophic level, photosynthesis,</p>

7	<p>How do we construct a food web?</p> <ul style="list-style-type: none"> • <i>Describe, explain, analyse and classify</i> feeding relationships between organisms in an environment using food chains and food webs. • <i>Construct</i> food chains and food webs to represent and analyse feeding relationships in an environment using evidence • <i>Summarise</i> information from secondary sources • <i>Investigate</i> the meaning of unknown terminology • Use information and meaning to <i>identify</i> and <i>explain</i> feeding relationships <p>Critical Vocabulary: environment, biotic, abiotic food chain, food web, producer, consumer, predator, prey, herbivore, carnivore, omnivore, trophic level, photosynthesis,</p>	<p>How do we construct a food web?</p> <p>Formative assessment (15mins) – construct a food web using familiar species.</p> <ul style="list-style-type: none"> • <i>Describe, explain, analyse and classify</i> feeding relationships between organisms in an environment using food chains and food webs. • <i>Construct</i> food chains and food webs to represent and analyse feeding relationships in an environment using evidence • <i>Summarise</i> information from secondary sources • <i>Investigate</i> the meaning of unknown terminology • Use information and meaning to <i>identify</i> and <i>explain</i> feeding relationships <p>Critical Vocabulary: environment, biotic, abiotic food chain, food web, producer, consumer, predator, prey, herbivore, carnivore, omnivore, trophic level, photosynthesis,</p>	<p>How do we find information to construct a food web?</p> <ul style="list-style-type: none"> • <i>Summarise</i> information from secondary sources • <i>Investigate</i> the meaning of unknown terminology • Use information and meaning to <i>identify</i> and <i>explain</i> feeding relationships
8	<p>How can we use a food web to make predictions about changes in ecosystems?</p> <ul style="list-style-type: none"> • Use food chains and webs to <i>predict</i> how human activity/environmental change can impact feeding relationships • Explain how the result from managing the environment may impact related industries • <i>Summarise</i> information from secondary sources • <i>Investigate</i> the meaning of unknown terminology • Use information and meaning to <i>identify</i> and <i>explain</i> feeding relationships 		<p>Revision/extension – eg. parasites</p>
9	<p>Assessment – research and construct a food web including <u>at least</u> 2 producers, 3 1st order consumers, 3 2nd order consumers, and 2 other species. - Create dichotomous key for the species in your food web that could be used by field researchers</p>		
10 E-Mark	<p>Water Cycle- a biotic factors in food webs/ecosystems</p>		

Resources:

- C2C – Unit 7 (Classification), Unit 8 (Food web and impacts) and Unit 1 (Water only),
- Oxford Big Ideas Year 7 (textbook)