Science Vocabulary

Vocabulary of the Australian Curriculum F-10

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The purpose of the document is to highlight the vocabulary across the curriculum. **It is not designed to be used as a scope and sequence to teach vocabulary in this order!** The document can help schools/teachers identify vocabulary/morphology commonalities within the same learning area across multiple years and within the same year across different learning areas. This may help schools/teachers choose appropriate morphological units and vocabulary to include in explicit lessons.

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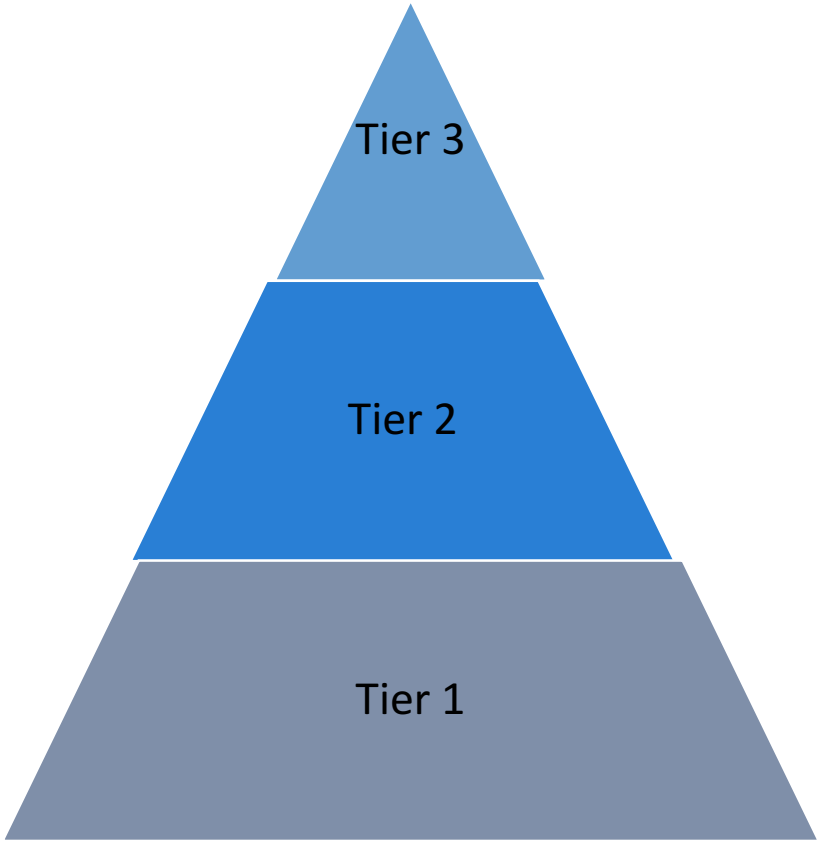
Tiers of vocabulary



Tier 3: Domain-specific words best taught in context of the topic (e.g. subject-specific words such as 'evaporation and vegetation). Students need repeated opportunities to practice such words in authentic contexts. **These words should be taught during the specialised/specific subject area to broaden students' knowledge of the topic. Ensure you explicitly teach the morphology of these words.**

Tier 2: Sophisticated words (relative to the age of the person) that are multi-dimensional and/or can be used in a variety of contexts and disciplines (e.g. emerge, originate, influence). Tier 2 words can also be selected from texts used in class (e.g. short-stories, picture books, non-fiction texts). **Students will benefit from explicit vocabulary instruction of tier 2 words, as these words can be transferred to other subject matter/ contexts. Ensure you explicitly teach the morphology of these words.**

Tier 1: words likely learnt from everyday experiences that do not usually need to be explicitly taught. Students who are EAL/D (English as an Additional Language/Dialect) or students with language delays/ Developmental Language Disorder may require explicit instruction of tier 1 words.

The Reading Science in Schools Vocabulary document

contains Tier 2 & 3 words.

Tier 2 words are highlighted in blue.

Teaching Tier 2 Vocabulary

based on *Bringing Words to Life* (Beck, McKeown, Kucan, 2013)

- Provide a child friendly definition of the word. Students say the word and the definition.
- Highlight the word's phonology, orthography and morphology.
- Provide examples of the word used in sentences to help clarify meaning and utility (and examples of the word beyond the original story/text). In Early Years, the focus will be on *oral* sentences initially, whereas in Primary and High School, the students should have multiple opportunities to hear, say, read and write full sentences containing the target word.
- Provide examples of the word within sentences demonstrating the word's diverse morphology.
- Provide non-examples of the word to clarify meaning. Finding non-examples can sometimes be difficult for certain words, but this step can assist in refining the child's understanding of the word and prevent any generalisations/misconceptions.
- Students practise using the word in different sentences when given a sentence stem, picture prompt etc.
- Revise previously taught vocabulary throughout the term/year to ensure they are stored in long term memory.

For a detailed description of vocabulary instruction in early and later grades, please see:

- Bringing Words to Life: Robust Vocabulary Instruction by Beck, McKeown & Kucan (2013)

- Understanding and Teaching Reading Comprehension: A Handbook by Oakhill, Cain and Carsten (2015) Chapter 5 – Knowing and Learning the Meaning of Words

Science

	Science Understanding				Science as a Human Endeavour	Science Inquiry Skills
	Biological	**Chemical**	**Earth and Space**	**Physical**		
PP	living needs environment warmth bushland	materials texture flexibility shelter local environment	environment season seasonal weather hibernate migration	object move push pull roll slide	observe, observation describe events changes 5 senses	question respond investigate/investigation senses discuss/discussion represent
1	features purpose plants roots leaves external living different needs habitats local environment land change	materials shapes objects bending stretching twisting warmed cooled change natural	local environment natural managed constructed features patterns events weather season/s, landscape	senses vibrations source illuminate striking blowing scraping shaking musical instrument loudness pitch actions	question events features descriptions change resources environment materials sustainable produce different compare identify explore	question prediction observation research sorting classify characteristics similar opposite compare investigation tables graphs similarities differences *links to math - length, distance - column graph - picture graph

	Biological	Chemical	Earth and Space	Physical	Science as a Human Endeavour	Science Inquiry Skills
2	living offspring characteristics similar/different	recycled products materials utensils	conserve resources soil minerals humans Earth	push pull object land water air Earth	question events features descriptions rainfall water levels temperature manage protect waste threatened (resources) preservation	question prediction observation research sorting classify characteristics similar opposite compare investigation similarities differences *links to math - length, distance - graphs - tables
3	living non-living observable sensitive/ity reproduce/ing characteristics	solid liquid state (matter) heat materials temperature recycle	Earth rotation axis source timescales relative (size) cyclic	heat friction motion electricity chemically transfer/red conduction thermometer production (energy)	predictions patterns relationships environment astronomy pollutant	question prediction observation research investigation tables graphs represent classify patterns trends fair (test) similarities differences

						*links to math - formal units and their abbreviations: seconds, grams, centimeters
	Biological	**Chemical**	**Earth and Space**	**Physical**	**Science as a Human Endeavour**	**Science Inquiry Skills**
4	life cycles germination species	natural processed materials physical properties influence pollution	surface (Earth) landforms Erosion extreme (weather) landscape floods continents- Asia/Australia distribution flora/fauna	exert/ed/ion distance contact compare contrast forces friction surface attraction/repulsio n	predictions patterns relationships scientist sorting classification estimation contribute/d habitat human activity minimise	predictions investigation fair (tests) formal/informal measures graphs tables *links to math - patterns - trends

	Biological	Chemical	Earth and Space	Physical	Science as a Human Endeavour	Science Inquiry Skills
5	structural features adaptations survive nocturnal conservation	states solids liquids gases observable properties substances temperature evaporation conserve/ate/ion	system orbit/ing energy relative (size) distance timekeeping	absorb/ed/ion reflect/ed/ion refract/ed/ion extended transparent opaque translucent	data phenomena predictions evidence explanations historical cultural ecological zoological sustainable harvesting species arid precious (water resources)	clarifying investigations phenomena predictions adaptations field observations simulations trial and error experimental testing risks fair (test) measurement *links to math - units of measurement- grams, seconds, metres, kilometres, millimetres - tables and diagrams - spreadsheets - patterns and relationships

	Biological	Chemical	Earth and Space	Physical	Science as a Human Endeavour	Science Inquiry Skills
6	growth survival physical conditions organisms migration hibernation climate	reversible irreversible soluble/ity substance recycle evaporation adhesives	geological extreme (weather events) earthquakes tsunamis volcanic eruptions natural disaster drought	electrical energy transfer/ed/ence transform/ed/ence circuits generated (energy) conductors insulators devices turbines solar sustainable	data evidence phenomena historical cultural geological events climatic events sustainable/sustainability institutions contemporary catastrophic seismograph resources medicinal nutritional scientific advances global disaster ecology/ecological	investigation predictions experimental field equipment materials risks variables fair (test) record data accuracy *links to math - units of measurement- grams, seconds, metres, kilometres, millimetres - tables and diagrams - spreadsheets - patterns and relationships - dynamic representations

	Biological	Chemical	Earth and Space	Physical	Science as a Human Endeavour	Science Inquiry Skills
7	classification diverse/diversity organisms features kingdom phylum class order family genus species habitat interactions food chain food web environment ecosystems microorganism produce (noun) medicine deforestation agriculture species invasive effect/effects 'communication systems' 'hierarchical classification systems' 'feeding	mixtures solution (chemical) combination techniques solvent solute separate/separated/ separation filtration decantation evaporation crystallisation chromatography distillation methods sieving winnowing yandying filtering 'cold pressing' 'steam distilling' 'pure substances'	predictable seasons lunar cycle solar eclipse rotation orbit(s) weather conditions state (of matter) factors nature renewable non-renewable regeneration timescales energy source(s) sustainable sustainability 'moon phases' 'natural phenomena' 'relative position(s)' 'ocean tides' 'seasonal changes' 'water cycle' 'Earth's resources'	motion force(s) balanced unbalanced stationary lever pulley system wheel and axle screw (machine) inclined plane wedge (machine) gravity planets orbit 'Earth's gravity' 'equal magnitude' 'gravitational attraction (pull)' 'simple machine'	solutions (to problems) science technology society forces motion recycling greywater blackwater telescope(s) space probes solar system model (noun) scientists astronomy medicinal plants endemic plants contribution(s) environment(s) protect/protection biodiversity sustainability ecosystems bio-piracy 'scientific knowledge' 'scientific evidence' 'scientific development(s)' 'technological advances' 'application of technology'	predict/predictions fieldwork experiments observations primary sources secondary sources measure/measurement variables data accuracy fairness tables spreadsheets graphs keys models analyse patterns relationships summary/summarise evidence diagrams hypothesis evaluate improve outcomes 'scientific questions' 'scientific knowledge' 'scientific investigation' 'scientific research'

	relationship(s)' 'human activity'		'resource management'		'transnational collaborative research' 'contemporary issues' 'human impacts' 'land management practices' 'contemporary management' 'ethical considerations' 'safety regulations' 'human activity' 'positive effects' 'negative effects' 'commercial products' 'intellectual property rights' 'culturally sensitive locations' 'land councils' 'land access rights' 'mutually beneficial outcomes'	'scientific equipment' 'scientific language' 'fair testing' 'safety considerations' 'safety guidelines' 'ethical considerations' 'ethical guidelines' 'controlled variables' 'dependent variables' 'independent variables' 'information technologies' 'specialised equipment' 'expected results' 'data analysis' 'quality of data' 'trends in data'

	Biological	Chemical	Earth and Space	Physical	Science as a Human Endeavour	Science Inquiry Skills
8	organisms microscope simulations cells organs tissues reproduce mitosis structure function herbivores carnivores mammals 'cell structures' 'plant cells' 'animal cells' 'fungal cells' 'cell growth' 'cell repair' 'cell division' 'single cell organisms' 'multi-cellular organisms' 'asexual reproduction' 'sexual reproduction' 'organ systems' 'specialised cells' 'digestive	properties motion arrangement structure particles solids liquids gases phenomena energy temperature elements compounds mixtures substances quicklime plaster pigments dyes acids salts ethanol symbols formulas reactions flammability corrosive/corrode 'states of matter' 'periodic table' 'particle model' 'particle level'	minerals formed process/processes Earth timescales formation forces energy ores geology 'sedimentary rocks' 'igneous rocks' 'metamorphic rocks' 'physical properties' 'chemical properties' 'valuable resource'	energy movement gravity temperature by-product 'forms of energy' 'kinetic energy' 'heat energy' 'potential energy' 'stored energy' 'energy transfer' 'energy transformation' 'gravitational potential' 'flow diagrams'	evidence cells science technology health medicine pharmaceuticals field (area of study) microscope cell functions cell division extraction functioning physics chemistry biology geology recycling sustainable/sustainability occupations environment ecosystems engineers yield horticulture fruit production vineyards artefacts 'scientific knowledge' 'scientific developments' 'nature of matter'	predict/predictions fieldwork experiments observations primary sources secondary source measure/measurement variables data accuracy fairness tables spreadsheets graphs keys models analyse patterns relationships summary/summarise evidence diagrams hypothesis evaluate improve outcomes 'scientific questions' 'scientific knowledge' 'scientific investigation' 'scientific research' 'scientific equipment'

	systems’ ‘respiratory systems’	‘chemical change’ ‘physical change’ ‘chemical properties’			‘particle theory’ ‘technological developments’ ‘technological advancements’ ‘mineral resources’ ‘body systems’ ‘medical science’ ‘material science’ ‘organ replacement’ ‘organ transplantation’ ‘reproductive technologies’ ‘disease treatment’ ‘disease control’ ‘contemporary issues’ ‘ethical issues’ ‘ethical considerations’ ‘ethical implications’ ‘household waste’ ‘land management practices’ ‘energy efficiency’ ‘energy consumption’ ‘solar-powered vehicles’ ‘sustainable technologies’ ‘synthetic fibres’ ‘heat-resistant plastics’ ‘modern farming techniques’ ‘ecological relationships’ ‘agricultural practices’ ‘plant cloning techniques’ ‘heritage sites’	‘scientific language’ ‘fair testing’ ‘safety considerations’ ‘safety guidelines’ ‘ethical considerations’ ‘ethical guidelines’ ‘controlled variables’ ‘dependent variables’ ‘independent variables’ ‘information technologies’ ‘specialised equipment’ ‘expected results’ ‘data analysis’ ‘quality of data’ ‘trends in data’

	Biological	Chemical	Earth and Space	Physical	Science as a Human Endeavour	Science Inquiry Skills
9	interdependence organisms abiotic environment matter functioning models flow diagrams simulations responses micro-organisms exposure ecosystem interactions organisms predator prey parasites competitors pollinators disease destruction habitat sustainability bushfires drought flooding 'multi-cellular organisms' 'internal systems' 'respiratory	matter atoms structure nucleus nuclei protons neutrons electrons decay mass charge energy released radiocarbon reactants products combustion reactions acids metals bases carbonates oxygen respiration photosynthesis environment ecosystems 'natural radioactivity' 'atomic structure' 'molecular	earthquakes 'tectonic plates' 'theory of plate tectonics' 'global patterns' 'geological activity' 'continental movement' 'sea-floor spreading' 'volcanic activity' 'constructive plate boundaries' 'destructive plate boundaries' 'heat energy' 'convection currents'	energy movement medium phenomena convection conduction radiation properties transferred waves (energy) sound (waves) light (waves) 'heat transfer' 'energy transfer' 'wave model' 'particle model' 'electric circuit' 'sound energy'	models theories contestable developments technology/technologies evidence scientists radioactivity research evaluate/evaluations properties (characteristics) radar science engineering technology medicine careers telecommunications pharmacy physiology functions interactions monitoring claims explanations predict/predictions detection treatment nanotechnology pharmaceuticals fuels	predict/predictions hypothesis collaborating/collaboration field work laboratory experiments representations modelling simulations probes tables spreadsheets graphs results mean median range patterns relationships analyse summarise outcomes properties (characteristics) evidence validity 'scientific questions' 'scientific concepts' 'scientific investigations' 'scientific instruments'

	system' 'circulatory system' 'digestive system' 'nervous system' 'excretory system' 'body systems' 'endocrine systems' 'electromagnetic radiations' (e.g. X-rays and microwaves) 'energy flow' 'seasonal changes' 'introduced species' 'food webs'	structure' 'alpha particles' 'beta particles' 'gamma radiation' 'unstable atoms' 'chemical reactions' 'rearrangement of atoms' 'conservation of mass' 'chemical equations' 'non-living systems' 'living systems' 'energy transfer' 'exothermic reactions' 'endothermic reactions' 'combustion reactions' 'oxidation reactions' 'biological processes' 'chemical processes' 'fire-mediated reactions' 'firestick farming' 'nutrient transfer'			ecosystems perspectives 'scientific community' 'scientific understanding' 'scientific research' 'scientific discoveries' 'historical development' 'technological advances' 'theory of plate tectonics' 'seafloor spreading' 'volcanic activity' 'disease transmission' 'subatomic particles' 'environmental changes' 'fire regimes' 'fire management policy' 'electromagnetic radiation' 'microwave cooking' 'continental movement' 'imaging technologies' 'body systems' 'greenhouse gas emissions' 'environmental factors' 'species populations' 'traditional fire management practices' 'atmospheric pollution' 'indigestion tablets' 'electrical devices' 'cochlear implant' 'bionic eye'	'scientific language' 'primary sources' 'secondary sources' 'controlled variables' 'dependent variables' 'independent variables' 'risk assessment' 'potential hazards' 'information technologies' 'data loggers' 'reliable data' 'data analysis' 'mathematical analyses' 'trends in data' 'quality of data' 'evidence-based arguments' 'ethical issues' 'humane research' 'fauna distributions' 'flora distributions' 'cultural heritage protection'

					‘mobile technologies’ ‘human activity’ ‘medical technology’ ‘biomechanical engineering’ ‘modern science’ ‘contemporary society’ ‘restorative ecology’	
	Biological	**Chemical**	**Earth and Space**	**Physical**	**Science as a Human Endeavour**	**Science Inquiry Skills**
10	transmission generation DNA genes chromosomes blueprint characteristics organisms offspring meiosis fertilisation inheritance genotypes phenotypes mutations heredity diversity breeding survival reproduction evolution fossils biodiversity ‘genetic	properties elements metals acids bases carbonates chemistry substances fuels pharmaceuticals equations temperature catalysts ‘atomic structure’ ‘Periodic table’ ‘electron shells’ ‘electronic structure’ ‘chemical reactions’ ‘toxic plants’ ‘edible food products’	universe galaxies stars origin evolution formation biosphere lithosphere hydrosphere atmosphere biodiversity permafrost global climate ‘solar systems’ ‘celestial bodies’ ‘Big Bang theory’ ‘microwave radiation’ ‘global systems’ ‘water cycle’ ‘carbon cycle’ ‘nitrogen cycle’	energy conservation efficient/efficiency pendulums motion forces distance time speed mass acceleration velocity ‘energy transfer’ ‘energy transformation’ ‘total energy’ ‘usable energy’ ‘laws of physics’ ‘stationary object’ ‘constant motion’ ‘balanced forces’	models theories contestable scientists exploration science engineering technology/technologies advances universe evaluate claims explanations predictions evidence structure DNA infections bioinformatics nanotechnology astronomy phenomena megafauna innovative/innovation	predict/predictions hypothesis collaborating/collaboration field work laboratory experiments representations modelling simulations probes tables spreadsheets graphs results mean median range patterns relationships analyse summarise outcomes properties

	characteristics' 'dominant genes' 'recessive genes' 'theory of evolution' 'natural selection' 'artificial selection' 'structural adaptations' 'physiological adaptations'		'phosphorus cycle' 'greenhouse effect' 'greenhouse gas emissions' 'climate change' 'sea levels' 'sea ice' 'deep ocean currents' 'marine life' 'fire management regimes'		transport communication atmosphere ozone evolution heredity policies pharmaceuticals 'scientific discoveries' 'scientific developments' 'scientific research' 'scientific understanding' 'scientific observations' 'scientific community' 'scientific misconceptions' 'technological advances' 'information technology' 'biochemical evidence' 'anatomical evidence' 'fossil evidence' 'double helix model' 'genetic knowledge' 'DNA sequencing' 'periodic table' 'climate change' 'atmospheric pollution' 'germ theory' 'traditional medicines' 'wound treatment' 'dating methods' 'modern science'	(characteristics) evidence validity 'scientific questions' 'scientific concepts' 'scientific investigations' 'scientific instruments' 'scientific language' 'primary sources' 'secondary sources' 'controlled variables' 'dependent variables' 'independent variables' 'risk assessment' 'potential hazards' 'information technologies' 'data loggers' 'reliable data' 'data analysis' 'mathematical analyses' 'trends in data' 'quality of data' 'evidence-based arguments' 'ethical issues' 'humane research' 'fauna distributions' 'flora distributions' 'cultural heritage protection'

					‘contemporary society’ ‘gene technologies’ ‘gene therapy’ ‘genetic engineering’ ‘genetic testing’ ‘genetic counselling’ ‘embryo selection’ ‘genetic mutations’ ‘carbon pollution’ ‘carbon capture’ ‘environmental footprints’ ‘sustainable transport’ ‘ecological sciences’ ‘restorative programs’ ‘energy transfer devices’ ‘financial backing’ ‘disease outbreak’ ‘drug-resistant infections’ ‘therapeutic compounds’	