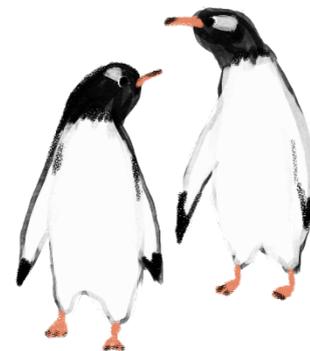


# Teaching the Language of Climate Change Science



## TEXT ANALYSES: CHAPTER 7 YEARS 5-6

Teachers of Years 5\_6 students: please don't feel daunted by all the grammatical information provided in these text analyses. You do need to display the whole text so you can teach how a text is logically structured (the information in the left-hand column). When it comes to teaching language and grammar resources (right-hand column), choose one or two paragraphs to teach thoroughly, taking sentences, noun groups and phrases apart and put them back together again so that students understand how a good paragraph is structured. *Don't try to cover every little thing in every paragraph. You'll all cry!*

### Focus text: adaptation (p 89)

Structure	Text	Language resources
<p>Question as heading</p> <p>Definition</p> <p>Purpose</p> <p>How it helps</p> <p>5 examples of how adaptation helps</p>	<p><b>What is adaptation?</b></p> <p>Adaptation is a change that happens to organisms such as plants and animals, helping them to survive, thrive and reproduce in their habitat. Adaptations help organisms to find a niche where they don't have to compete with other organisms.</p> <p>Adaptations help organisms with protection from predators, finding food, communicating with each other, reproduction and surviving harsh weather.</p>	<p>Heading as a question invites the reader to find answer.</p> <p><i>Adaptation</i> is a noun formed from verb 'adapt'.</p> <p>Verb <i>is</i> points to the definition which is a big noun group (begins with <i>the way</i> and ends with <i>habitat</i>).</p> <p><i>Help..to protect</i> one verb group.</p> <p>Commas separate verbs in a list 'to survive, thrive...'</p> <p>All three sentences in the paragraph start with 'adaptations' (helps with cohesion).</p> <p>List of ways that adaptations help: some are 'how' <i>phrases</i> 'with protection from predators', some are 'how' <i>clauses</i> beginning with '-ing' verbs '[with] finding food'.</p>
<p>Question as heading</p> <p>Topic sentence</p> <p>Stage 1</p> <p>Stage 2</p> <p>Stage 3</p>	<p><b>How long does an adaptation take?</b></p> <p>An adaptation usually takes many generations. It starts with one accidental change that gives the organism a better chance of surviving. Over time, the organisms without the adaptation die out, and those with the adaptation keep on reproducing.</p>	<p>This is a mini-explanation in three stages.</p> <p>Modality: <i>Usually</i> included to make statement accurate (scientists do this a lot)</p> <p><i>many generations</i>: time scale is implied: maybe hundreds of years (you may have to explain this)</p> <p>Expanded noun group <i>one accidental change.. to surviving</i> condenses info.</p> <p><i>Over time</i> marks next stage, and supports time scale in <i>generations</i>.</p> <p><i>Those...</i> is 'ellipsed'. It's short for <i>those organisms</i> but leaving the noun out helps the paragraph to stick together.</p> <p>These are generalised statements about adaptation. Subsequent paragraphs become more specific.</p>

<p>Heading Topic sentence signals types</p> <p>Structural adaptations with examples</p> <p>Behavioural adaptations with examples</p>	<p><b>Types of adaptation</b></p> <p>There are two types of adaptation: structural and behavioural. Structural adaptations are physical, such as size, shape and colour. Behavioural adaptations are actions that help the organism to survive, such as hunting at night, spitting at predators or curling up in a ball for protection.</p>	<p>'There are' is like saying 'there exist', to introduce the two types of adaptation.</p> <p>The next two sentences describe the two types of adaptation, and have similar grammatical patterns: type of adaptation, followed by features and example.</p> <p>Note that physical adaptation examples consist of adjectives and nouns, behavioural adaptation examples consist of actions with adverbial phrases (which makes sense!).</p>
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## Focus text: adaptations of the green turtle (p 90)

Structure	Text	Language resources
<p>Heading: classification</p> <p>Habitats in general</p> <p>Australian habitats</p>	<p><b>Classification and habitat</b></p> <p>Green turtles (<i>Chelonia mydas</i>) are reptiles found in coral and rocky reefs and seagrass meadows in tropical and subtropical regions around the world.</p> <p>In Australia, populations of green turtles nest in seven regions, including the southern Great Barrier Reef, the northern Great Barrier Reef, the Coral Sea, the Gulf of Carpentaria and several reefs off the coast of northern Western Australia.</p>	<p>Now the focus of the text shifts to adaptations of one animal.</p> <p>Definition of green turtles: name on one side of 'are', and big noun group on the other. It includes classification and habitat.</p> <p>Technical terms: reptiles, regions, nest, Latin name (often in brackets or italics).</p> <p>Second para is more specific: Australia only, and 'populations of green turtles', not <i>all</i>. Specific numeric detail in the 'where' phrase: 'seven regions', followed by a list of habitats. These are all part of the same noun group that, along with 'in', makes up the 'where' phrase.</p>
<p>Heading: Physical adapt<sup>n</sup>s</p> <p>Adaptation (shape) and function</p> <p>Adaptation (shape) and reason</p> <p>Adaptation (shape) and function</p>	<p><b>Physical adaptations</b></p> <p>Unlike some other turtles with a domed shell, green turtles have a streamlined, wide, flat rounded shell and paddle-like flippers to help them swim fast and far. Their head and legs are non-retractile, that is, they do not fit under their shell. This is because retractile limbs would reduce their speed. They have a jaw with fine serrated edges to help them eat sea grasses and</p>	<p>'Physical adaptations' is a nominalisation of verb 'adapt'.</p> <p>Very technical descriptions of shape attributes here, all condensed into noun groups: e.g. 'wide, flat and rounded, 'non-retractable' 'fine serrated edges'. 'This' refers to the non-retractile adaptation. Note contrast with 'other turtles...domed shell': compares adaptations.</p> <p>Each adaptation is followed by either <i>its function</i>, e.g. 'to help them eat sea grasses and algae', 'for camouflage', OR <i>a reason</i> e.g. 'because retractile limbs...</p>

<p>Adaptation (colour)</p> <p>Function</p> <p>Adaptation (organ)</p> <p>Function</p> <p>Function</p>	<p>algae.</p> <p>Green turtle shells are olive green, red-brown and black on top. Underneath they are pale yellow or cream-coloured for camouflage. Seen from above, green turtles blend in with coral and sea grass on the ocean floor. Seen from below, the pale underside of the shell blends in with the lighter surface of the ocean.</p> <p>Green turtles secrete excess salt from glands behind their eyes. This adaptation allows them to live in the salty ocean and not absorb too much salt into their bodies. When they are digging in the sand to lay eggs, the salt 'tears' help to wash away any sand that gets in their eyes.</p>	<p>Technical descriptions of colour here: e.g. olive-green, cream coloured.</p> <p>Once again, form is followed by function. Colour above is contrasted with colour below, 'seen from above' and 'seen from below' (useful scientific phrase to learn) because these colours have different purposes.</p> <p>Technical words 'secrete' 'excessive salt', 'glands'.</p> <p>'This adaptation' refers to all of the information in the previous sentence, ties the sentences together, points to two useful functions: living in salty water, and washing away sand.</p> <p>N.B. complicated verb groups here: allows.. to live... and... not absorb ...help...to wash away</p>
<p>Heading: behavioural Issue</p> <p>Function</p> <p>Adaptation 1</p> <p>Adaptation 2</p> <p>Adaptation 3</p> <p>Function</p> <p>Reproductive adaptation 4</p> <p>Function</p>	<p><b>Behavioural adaptations</b></p> <p>Like all reptiles, green sea turtles cannot generate their own body warmth. To keep warm, they swim near the surface of the ocean, where the water is warmer.</p> <p>Sometimes they sunbathe on beaches. The green turtle diet of sea grass and algae helps to keep the sea grass beds healthy, much like mowing a lawn.</p> <p>Every five to eight years the females return to lay their eggs on warm tropical beaches, where the temperature of the sun incubates the eggs.</p>	<p>'Like all reptiles' is in theme position: first paragraph places turtles as part of larger group of reptiles. (Very common in scientific writing do this.)</p> <p>'own body warmth' is nominalisation, which links this sentence to next one: 'To keep warm' which is function of adaptation. This time the function precedes the adaptation in the sentence.</p> <p>The function of sunbathing can be inferred from previous sentences.</p> <p>Expanded noun group: 'green turtle diet...algae'</p> <p>Verb group 'helps to keep' signals function of adaptation (this time helps habitat, not themselves)</p> <p>In final para, lots of inferences to be made: frequency of return (time phrase at front), homing instinct (return to lay), and function of adaptation: to a warm place (temperature of sun...).</p>
<p>Heading: risks</p> <p>Topic sentence: intro to risks</p>	<p><b>Risk from climate change</b></p> <p>In northern Queensland, where green turtles breed, they are facing two impacts of climate change. First, the temperature of</p>	<p>The title indicates a change of focus.</p> <p>'Where' phrases begin topic sentence, and issues are foregrounded. 'they' refers to the turtles, 'are facing' continuous present tense verb tells us this is now</p>

<p>Risk 1 -Tell us more</p> <p>Risk 2</p>	<p>the sand is rising and heating up the turtle nests. Because sand temperature influences whether turtle hatchlings will be male or female, about 99% of hatchlings are now being born female. Without males, the turtles cannot reproduce. The second impact is the flooding of nests by the rising sea level.</p>	<p>and ongoing. are 'two impacts of climate change.'</p> <p>'First' and 'second' sequence the risks or impacts. The 'because' clause identifies the cause and the 'about' clause identifies the risk ie 'female hatchlings'</p> <p>'The second impact' and 'the flooding of nests' are both noun groups with nominalisations: 'impact' and 'flooding' are both verbs acting as nouns. 'By...' is a 'how' phrase.</p>
<p>Heading: human help</p> <p>Topic sentence: humans needed</p> <p>Why</p> <p>Scientists' help (Risk 1 above)</p> <p>Scientists' help (Risk 2 above)</p> <p>All humans help</p> <p>How: actions</p> <p>How: talk</p>	<p><b>How humans are helping</b></p> <p>Green turtles need the help of humans to survive the threat of climate change. They cannot adapt quickly enough by themselves. To lower the temperature of the sand, scientists erect shades over the nests, and use water to cool the sand. This way they make sure that at least some hatchlings are males. Scientists are also raising the height of nesting sites that are threatened by sea level rise.</p> <p>All humans have to help slow down climate change to give living things a chance to adapt to the new climate. As well as reducing our use of resources – especially fossil fuels – re-using wherever possible and recycling as a last resort, we can be spokespeople for living things that cannot talk, and influence others to use resources thoughtfully.</p>	<p>The heading is in the form of a statement (cf with question headings)</p> <p>Lots of 'to...' clauses to show purpose and goal e.g. 'to survive the threat...', 'to lower the temperature...'</p> <p>'Threat' links with the words 'risk' and 'impact' from the previous paragraph. 'cannot adapt' is the verb group followed by two 'how' phrases: 'quickly enough' and 'by themselves'.</p> <p>In first para, participants are scientists. 'This way' refers back to the whole of the previous sentence, i.e. the efforts of the scientists. 'Scientists' are foregrounded in the next sentence in order to recognise their work. the height of nesting sites ...level' is one big noun group.</p> <p>2<sup>nd</sup> para, the shift to 'all humans' includes the reader. Verb group is big: 'have to help slow down...' followed by 'to...give a chance' clause of purpose. How we do that is listed as a series of actions. First group of actions is reducing use of resources (as well as...), followed by second group of actions, talk: speaking out, and influencing.</p>

## Focus text: the enhanced greenhouse effect (p 94)

Structure	Text	Language resources
<p>Heading</p> <p>Topic sentence (definition)</p> <p>Tell us more: functions</p> <p>Function 1</p> <p>Function 2</p>	<p><b>The atmosphere</b></p> <p>The atmosphere is <u>a relatively thin layer of air that surrounds the Earth.</u></p> <p>It provides <u>a habitable climate for all living things</u> in two ways. First, it regulates <u>the temperatures on Earth.</u></p> <p>Second, <u>the gases in the upper atmosphere</u> protect the Earth from <u>the majority of harmful ultraviolet rays from the sun.</u></p>	<p>-Definition: 'thing' on one side of 'is', and massive noun group on the other (relatively thin layer...). (Noun groups are underlined.)</p> <p>-'Relatively': adverb to modify how thin.</p> <p>Scientists do this to make sure their statements are completely accurate.</p> <p>-Pronoun 'it' refers to 'atmosphere', not 'earth'.</p> <p>-Many technical terms: e.g. habitable, climate, gases, ultraviolet rays.</p> <p>-Connectors 'first' and 'second' link back to 'in two ways'.</p> <p>-Most important feature in this para is expanded noun groups (underlined). When defining or describing, scientists like to leave nothing in doubt, so they load the noun group with condensed and specific info.</p>
<p>Topic sentence; definition</p> <p>Tell us more about the function of greenhouse gases.</p> <p>List greenhouse gases.</p> <p>Function</p> <p>More about the function.</p> <p>Foreshadowing of issue.</p>	<p><b>The greenhouse effect</b></p> <p>The greenhouse effect is <u>a natural process that warms the Earth's surface.</u> For over 800,000 years <u>greenhouse gases in our atmosphere</u> have helped to keep <u>temperatures on Earth</u> relatively stable. <u>The main greenhouse gases are carbon dioxide, methane, nitrous oxide and water vapour.</u> Although they only make up <u>about 1% of the Earth's atmosphere,</u> they have <u>a big influence on keeping the Earth's surface at a liveable temperature.</u> They trap heat in the atmosphere instead of letting it escape into space, ensuring the Earth is warm enough for life to thrive (see Figure 7.4, steps 1 to 4). However, this natural process has been affected by human activity.</p>	<p><b>E</b>ffect is the <b>end</b> result. (And a noun. 'Affect' is usually the verb.)</p> <p>-Definition: 'greenhouse effect' on one side of 'is', and the noun group on the other: 'natural process...surface'</p> <p>-Time phrase of extent 'For over...' in front of sentence for emphasis</p> <p>Modality: 'Relatively'; about 1%; only make up....' modify to keep statements true</p> <p>List of gases, joined by commas.</p> <p>Dependent clause 'Although' is conjunction of contrast: in front to signal the unexpected.</p> <p>-Noun groups again a big focus of this para. (Big noun groups underlined.)</p> <p>-ing verb 'ensuring' is beginning of dependent clause: tells us these things are happening at the same time: cause and effect in this case.</p> <p>However: text connective of contrast; links back to previous para and foreshadows the next one.</p> <p>Passive voice 'has been impacted by..'</p> <p>'Human activity' is a nominalisation: shifts from humans acting (verb) to human activity (noun)</p>

<p>Effect of human activity (same as last sentence of previous para)</p> <p>Name and its effect</p> <p>More about human activity: fossil fuels</p> <p>-how they're stored</p> <p>-what happens when they're burnt</p> <p>-effect 1</p> <p>Effect 2</p> <p>Effect 3</p>	<h3>The enhanced greenhouse effect</h3> <p><u>Concentrations of greenhouse gases in the atmosphere</u> are increasing due to <u>human activities, including energy production, agriculture and land clearing</u>. This is called <u>the enhanced greenhouse effect, which is contributing to the warming of the Earth</u>.</p> <p>Humans continue to burn <u>fossil fuels: coal, oil and gas</u>. These are stored in <u>different states: coal as a solid, oil as a liquid, and gas as a gas</u>. However, when burnt to produce electricity and power transport, they all release <u>large amounts of carbon dioxide</u> into the atmosphere, trapping more heat and reflecting it back to the Earth, instead of passing through to space. Much of this heat is absorbed in <u>the land and the oceans</u>.</p>	<p>'Concentrations of greenhouse gases' is a nominalisation: shift from verb to noun. Due to: preposition beginning a phrase showing cause and effect. 'Human activity' links back to final sentence of previous para. -List of activities uses 'including' to tell us this isn't the complete list.</p> <p>-'This' is reference item referring back to the whole process in the previous sentence, not just one word. 'Warming' is another nominalisation from verb. Note how the large noun group condenses a lot of information into a small space.</p> <p>Colon means 'more to come' and implies a close logical relationship on both sides of the colon. In these sentences, the colon implies 'namely', or 'that is'. 'These' refers back to previous list of fossil fuels. 'However': connector signalling a contrast, or apparently contradicting what has been said. This links back to previous sentence, followed by a dependent 'when' clause in front of sentence.</p> <p>'-ing' verbs 'trapping' and 'reflecting' and 'passing' all imply simultaneous action and cause and effect.</p> <p>-'is absorbed' is passive voice. The final sentence foregrounds the information in the next paragraph.</p>
<p>Effect in temperature rise</p> <p>Significance of effect</p> <p>Name</p> <p>Elaboration (example)</p>	<h3>The effects of enhanced greenhouse gases</h3> <p>Enhanced greenhouse gases have resulted in an average global temperature increase of approximately 1°C. Even one degree of warming is enough to change long-term weather patterns across the globe. This is known as climate change. The CSIRO reports, for example, that the south-eastern part of Australia continues to have longer,</p>	<p>JULIE</p> <p>Lots of nominalisations here: 'enhanced GHG', 'an average temperature increase...'. 'Have resulted in...' verb that shows cause and effect.</p> <p>'Even...' is an adverb that signals the unexpected.</p> <p>'This' refers back to the events in the previous sentence. 'Is known as...' is passive voice: who are the knowers? We all are, so it doesn't have to be stated. 'Climate change' becomes yet another nominalisation: encapsulates the 'changes in weather patterns' in previous sentence.</p> <p>'reports' is the simple present verb and what is reported 'that the ... previous decade'. This is a clause acting as a noun (could be substituted by a noun.)</p>

	hotter, drier summers than in previous decades.	
Impact  Proof  Our response -response 1  -response 2	<p><b>What we can do</b></p> <p>All over the globe, life is affected by climate change. Here in Australia the 2019/20 fires have shown how devastating those effects can be. It is up to all humans to pay attention to the scientific reports and to do all we can to reduce greenhouse gas emissions by reducing our dependence on fossil fuels.</p>	<p>The magnitude of the issue is captured in modality of this para: 'all over the globe' (not just in some places), 'life' (i.e. not just some people's lives), 'is affected' (not might be affected), 'up to <i>all</i> humans', 'all we can'...</p> <p>'Here in Australia' is a circumstance of place, 'the 2019/2020 fires' is the noun or participant, 'have shown' is the verb group. 'How devastating those effects can be' is clause acting as noun. (Could be replaced by a noun.)</p> <p>Final sentence is complex: Main clause is 'it is up to all humans', followed by three dependent clauses: 'to pay attention...', 'to do all we can to reduce...', by reducing...'</p>

## Focus text: the difference between weather and climate (p 101)

Structure	Text	Language resources
<p>Question as heading</p> <p>Definition -what is the same</p> <p>What is different</p> <p>Definition of weather</p> <p>-time scale of changes</p> <p>-characteristics</p>	<p><b>What is the difference between weather and climate?</b></p> <p>Weather and climate are all part of what happens around living things in their habitats. The difference is the time span used to observe them. Weather is what happens in the atmosphere in any part of the Earth each day. It can change from day to day and hour to hour. The characteristics used to describe weather are temperature, wind and precipitation (water falling from the sky in the form of rain, hail or snow).</p>	<p>The title announces what this paragraph is about (concepts often confused in the climate change discussions)</p> <p>The first sentence outlines what's common. The next sentence that starts with 'the difference'. 'Time span' links to the time scale of changes for weather and climate. Definition of weather: 'weather' on one side of 'is', and a clause acting as a noun group on the other side. (we can tell this because it could be replaced by a noun.)</p> <p>Lots of time phrases to explain the time scale of changes: 'each day', 'from day to day...'</p> <p>Technical words: 'characteristics' and 'precipitation'. As often happens, common-sense explanations are added in brackets.</p>
<p>Definition of climate</p> <p>-time scale of changes.</p> <p>Characteristics</p> <p>Local example of climate</p>	<p>Climate is the long-term weather pattern in any part of the world. Climate describes the typical weather conditions in an entire region for a very long time – 30 years or more. Different parts of the world have different climate zones with different average temperatures and different average precipitation. [Insert your town or region] has a [temperate /tropical/sub-tropical/arid /Mediterranean] climate.</p>	<p>Definition: 'climate' on one side of 'is', and the noun group on the other side. (Cf with 'clause as noun' in weather definition above.)</p> <p>Time phrases here explain the time and physical scale: 'in an entire region', 'for a very long time'.</p> <p>'Different' repeated here four times for emphasis.</p> <p>Technical terms here, this time without brackets. (assumes that the reader now gets this.)</p>
<p>Question as heading</p> <p>Cause of changes</p> <p>Effects in different parts of the world</p> <p>Local effects</p>	<p><b>Why is the climate changing?</b></p> <p>The world's climate is changing because of the increase in greenhouse gases in the atmosphere. Some parts of the world are having more extreme weather events. In other parts of the world, temperatures are increasing. Australia is experiencing both.</p>	<p>This is the vital question all students must be able to answer.</p> <p>Complex sentence with 'because...' clause of reason, begins to answer the question in the heading.</p> <p>The rest of the paragraph explains the varying consequences or effects: in 'some parts', 'in other parts of the world.' Final sentence is declarative and alarming. 'Both...' is ellipsed: means 'both extreme weather and increasing temperatures'.</p>

## Focus text: extreme weather events and the effect of climate change (p 103)

Structure	Text	Language resources
<p>Question as heading</p> <p>Definition of extreme weather</p> <p>Examples of extreme weather in a specific place</p>	<p><b>What is extreme weather?</b></p> <p>Extreme weather events are <u>those that are significantly different from the usual weather pattern in any place</u>. In Australia, <u>extreme weather events include bushfires, heatwaves, floods, earthquakes, storms, cyclones and landslides</u>.</p>	<p>Definition: 'extreme weather' on one side of 'are', and 'those...' noun group on the other. (Those... is ellipsed: short for 'those events'.)</p> <p>'In Australia': 'where' phrase is foregrounded to situate the extreme weather events.</p> <p>'Include', like 'is' is a relational verb a bit like an equals sign. Implies 'this isn't everything'.</p> <p>Simple list of events.</p>
<p>Question as heading (one example of extreme weather)</p> <p>Definition of heatwave</p> <p>When they occur</p> <p>Effect</p> <p>Effect</p>	<p><b>What happens in a heatwave?</b></p> <p>Heatwaves are defined as <u>three consecutive days of high maximum and high minimum temperatures for that location</u>. Heatwaves occur when hot, dry weather raises temperatures significantly above average day and night temperatures. When night-time temperatures are high, <u>organisms such as humans, animals and crops don't have a chance to recover, and the next day's temperature rises more quickly</u>. Heatwaves have been <u>the deadliest of the natural disasters in Australia</u>.</p>	
<p>Question as heading</p> <p>Topic sentence answers question.</p> <p>Example in specific place: Cause (heat in centre)</p> <p>Effect (heat moves to coast)</p> <p>Example: Australia as a whole</p>	<p><b>Where do heatwaves happen in Australia?</b></p> <p>Heatwaves can happen anywhere. In Australia, conditions in the centre of the country are often hot and dry because of its distance from the cooling effects of the oceans. A heatwave occurs when hot, dry air from the outback moves into coastal areas.</p> <p>In the spring of 2020, Australia had its warmest spring temperatures on record. For</p>	

Examples: specific towns	example, Thargomindah in Queensland recorded the hottest November day ever with a temperature of 46°C, while Andamooka, in South Australia, recorded a record spring day temperature of 48°C.	
<p>Question as heading</p> <p>Topic sentence answers question.</p> <p>Impact</p> <p>Impact</p> <p>Impact</p> <p>Impact</p> <p>Impact</p>	<p><b>What are the impacts of heatwaves?</b></p> <p>Extreme heatwaves affect <u>all living things, including humans, animals, and crops. Vulnerable people, including the elderly, the homeless, the very young, and people who are not well</u>, are at risk of heat stress.</p> <p>Animals can suffer from dehydration and put themselves in danger looking for water.</p> <p>Crop yields are reduced because the very hot, dry weather puts crops under stress.</p> <p>This can lead to food shortages (Carrington 2013). Heatwaves also affect electricity consumption, because there is a high demand for air conditioning. This can sometimes cause power outages, which make it even more difficult to deal with the heat.</p>	<p>This is a causal explanation: heatwaves and a list of the effects. They don't happen in stages, the effect is simultaneous.</p> <p>Topic sentence answers the heading. Modality: strong: 'all living things' followed by list. 'Crop yields <i>are</i> reduced', not 'might be'.</p> <p>Possibility: 'animals <i>can</i> suffer...', this <i>can</i> lead to ...'. This <i>can sometimes</i> cause power...</p> <p>Nominalisations: heat stress, dehydration, danger, food shortages, electricity consumption, high demand, power outages, crop yields, the heat.</p> <p>Big noun groups begin with a generalised noun followed by examples: 'all living things, including humans...', and 'vulnerable people, including the elderly...'</p> <p>Sometimes the cause / effect is explicit: 'affect, puts under stress, because...', cause... make it difficult. Sometimes the relationship is implicit and has to be inferred: 'at risk of heat stress...', looking for water.</p>
<p>Question as heading</p> <p>Topic sentence answers question</p>	<p><b>What is the effect of climate change on heatwaves?</b></p> <p>In Australia, the CSIRO and BOM recognise that climate change is increasing temperatures and the number of heatwaves.</p>	
<p>Question as heading</p> <p>Topic sentence answers question</p> <p>Short term actions</p> <p>-Goal -how, how, how</p>	<p><b>What can humans do to reduce the impact of heatwaves?</b></p> <p>Humans have to think about short-term and long-term actions to reduce the impact of heat waves. In the short term, we avoid heat stress by drinking plenty of water, finding a cool place to stay, wearing cool fabrics like cotton and wearing a hat outside.</p>	

<p>-Goal</p> <p>-Goal – how</p> <p>-Goal</p> <p>-Goal - purpose</p> <p>Long term actions</p> <p>-Goal</p> <p>– how</p> <p>-how</p> <p>-how</p>	<p>We look after vulnerable people, including family and neighbours. We provide animals with water by putting shallow containers around our homes and schools for animals, birds and insects to drink from. We give extra water, and make shade for vulnerable plants in our gardens. We plant trees to provide shade for animals.</p> <p>In the long term, humans have to slow down climate change by thoughtful use of the Earth’s resources, especially by using electricity generated from renewable resources rather than fossil fuels.</p>	
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## Focus text: the useful properties of light for energy efficiency (p 107)

Structure	Text	Language resources
<p>Heading</p> <p>Topic sentence introduces 3 properties</p> <p>Two important properties identified</p>	<p><b>The properties of light</b></p> <p>Light has three properties: reflection, absorption and refraction. Two of these properties – reflection and absorption – are useful to understand when making a house energy efficient.</p>	<p>'Properties' is abstract concept: presumed that readers know what it is (not explained)</p> <p>Colon means 'tell us more': in this case linking generalisation 'properties' to the three examples.</p>
<p>Heading: nominalisation</p> <p>Definition</p> <p>Tell us more</p> <p>Tell us more: dark and light objects</p> <p>Examples in list</p> <p>Example 1 and why</p> <p>Example 2 and why</p> <p>Example 3 and why</p> <p>Example 4 and why</p>	<p><b>Reflection</b></p> <p>Light reflection means <u>that light bounces off surfaces</u>. When it is reflected, it remains as light. <u>Light-coloured and shiny objects</u> reflect more light than <u>dark-coloured objects</u>.</p> <p>Examples of how light reflection is useful in the home:</p> <ul style="list-style-type: none"> <li>• Choosing a white, silver or light grey car because these are least likely to heat up in Summer.</li> <li>• Building houses with light-coloured roofs or painting the roofs with solar reflective paint. This helps to keep the house cooler in summer because more light is reflected back into the atmosphere instead of being absorbed as heat.</li> <li>• Putting reflective film on west-facing windows so that the light is reflected off instead of being transmitted into the house.</li> <li>• Using mirrors inside our homes. They are made of glass with a layer of silver that reflects the light. Mirrors bounce light around a room, making it brighter and reducing the need for electric light.</li> </ul> <p>To slow down climate change, we can make</p>	<p>Definition: light reflection on one side of 'means', and clause acting as a noun group on the other side. (We know when clause is acting as noun, because a noun could go in its place.)</p> <p>Each dot point in the list begins with the action as an -ing verb</p> <p>Each dot point explains why. Sometimes as a dependent clause (because...)</p> <p>'Why' is added as an additional sentence in this dot point. 'This' links the explanation back to previous sentence.</p> <p>'Why' is added as a dependent clause beginning with 'so that...', meaning 'in order to'.</p> <p>'Why' is added here as an '-ing' clause: making it brighter. We have to infer the cause and affect in this example.</p> <p>Clause of purpose or goal is foregrounded in this sentence,</p>

<p>Summary: general action and why</p>	<p>changes to our houses in summer so that light is reflected, rather than absorbed as heat, making our houses more energy efficient.</p>	<p>because the goal precedes 'how' we are going to achieve the goal. 'So that' used again to mean 'in order to'...</p>
<p>Heading: nominalisation</p> <p>Definition Tell us more Tell us more: dark and light objects</p> <p>Examples in list</p> <p>Example 1 and why</p> <p>Example 2 and why</p> <p>Example 3 and why</p> <p>Example 4 and why</p> <p>Example 5 and why</p>	<p><b>Absorption</b></p> <p>Absorption means that light 'soaks in': it is taken in by objects. When it is absorbed, it changes from light to heat. Dark objects absorb more heat than light-coloured objects. A few examples of how absorption is useful in the home:</p> <ul style="list-style-type: none"> <li>• Rooftop solar panels absorb sunlight and change, or transform, it to generate electricity for our homes.</li> <li>• Sunlight is transmitted through windows onto a concrete floor and changes to heat. The floor absorbs the heat to warm the house. At night, the concrete slowly releases the heat, gently warming the home.</li> <li>• Solar hot water systems absorb sunlight as heat via the roof panels, warming the water in pipes inside them panels, ready for use in the home.</li> <li>• A solar pool heating system absorbs sunlight as heat via black pipes on the roof. The pool water circulates so that warm water is pumped into the pool while cool water is pumped from the pool onto the roof to absorb the heat from the sun.</li> <li>• Outside blinds of different materials reflect the light or absorb the light as heat before it can be transmitted inside the house.</li> </ul>	<p>Grammar in this paragraph is similar to the one above. We find clauses that signal purpose: 'to...', and cause and effect: 'because...', 'to...', '-ing...'</p> <p>Sometimes cause and effect has to be inferred from the language provided. This is a good discussion for the class.</p> <p>Nominalisations: absorption.</p>

## Focus text: the albedo effect (p 111)

Structure	Text	Language resources
<p>Factorial explanation: heading is phenomenon identification Stage 1: sun-Earth</p> <p>Stage 2: absorption</p> <p>Stage 3 Reflection – light surfaces</p> <p>Stage 4 Absorption - dark surfaces</p> <p>Name of reflection process</p> <p>Where it happens</p> <p>Effect</p>	<p><b>What is the albedo effect?</b></p> <p><u>Radiation from the sun</u> reaches the Earth's surface during the day. <u>Some of the sun's rays</u> are absorbed as heat by <u>the land and the ocean</u>. Darker surfaces absorb more heat than lighter surfaces, so ice and snow reflect more heat, while <u>dark soils, rocks and dark oceans</u> absorb more heat. <u>The amount of heat that is reflected by Earth's surfaces</u> is called the albedo effect. <u>The snow and ice at the North and South Poles</u> reflect <u>a large amount of solar radiation</u> back into space. This helps to cool the Earth and plays <u>an important role in Earth's climate</u>.</p>	<p>Question as heading.</p> <p>Nominalisations: radiation, solar radiation</p> <p>Verbs in passive voice: 'are absorbed by...', 'is reflected...'</p> <p>Big complicated noun groups are <u>underlined</u>.</p>
<p>Causal explanation</p> <p>Stage 1</p> <p>Stage 2</p> <p>Stage 3</p> <p>Stage 4</p>	<p><b>How is climate change affecting the poles?</b></p> <p>As climate change warms the atmosphere and the oceans, more of the ice in the polar regions is melting. As a result, more heat is being absorbed by the dark oceans in the North and South Poles, and by the dark rocks in Greenland and the Antarctic. This process is speeding up the melting of the ice caps.</p>	<p>Question as heading: phenomenon identification</p> <p>Complex sentence with dependent time clause at front of sentence: tells us when the ice is melting and implies cause and effect. Connector 'as a result' tells us cause and effect</p> <p>'is being absorbed' is passive voice which tells us its happening continuously now. 'by the dark oceans' is the absorber. 'This process' refers back to the previous two paragraphs. 'is speeding up..' continuous and now. The 'melting' is a noun, not a verb.</p>