Government of **Western Australia**
School Curriculum and Standards Authority

Science

Teaching, learning and assessment exemplar

Year 5

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.

Background

This teaching, learning and assessment exemplar (the exemplar) has been developed by the School Curriculum and Standards Authority (the Authority) as part of the *School Education Act Employees (Teachers and Administrators) General Agreement 2017* (Clause 61.1–61.3).

Disclaimer

Any resources, such as texts and websites, 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 mandated or that they are the only resources relevant to the course. Teachers must exercise their professional judgement as to the appropriateness of any resources they may wish to use.

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Contents

The Western Australian Curriculum

The *Western Australian Curriculum and Assessment Outline* (the *Outline* – https://k10outline.scsa.wa.edu.au/) sets out the mandated curriculum, guiding principles for teaching, learning and assessment, and support for teachers in their assessment and reporting of student achievement. The *Outline* recognises that all students in Australian schools, or international schools implementing the Western Australian Curriculum, are entitled to be given access to the eight learning areas described in the *Alice Springs* (*Mparntwe*) *Education Declaration*, December 2019.

The Science curriculum

The mandated curriculum is presented in the year level syllabus documents.

The Science curriculum delivers a sequential and age-appropriate progression of learning with the following key elements:

- a year level description that provides an overview of the context for teaching and learning in the year
- a series of content descriptions, populated through strands and sub-strands, that sets out the knowledge, understanding and skills that teachers are expected to teach and students are expected to learn
- an achievement standard that describes an expected level that the majority of students are achieving by the end of a given year of schooling. An achievement standard describes the quality of learning (e.g. the depth of conceptual understanding and the sophistication of skills) that would indicate the student is well placed to commence the learning required in the next year.

This exemplar

This Science exemplar articulates the content in the *Outline* and approaches to teaching, learning and assessment reflective of the Principles of Teaching, Learning and Assessment. This exemplar presents planning for eight weeks of teaching and learning for each of the four terms, with a time allocation of two hours per week.

Catering for diversity

This exemplar provides a suggested approach for the delivery of the curriculum and reflects the rationale, aims and content structure of the learning area. When planning the learning experiences, consideration has been given to ensuring that they are inclusive and can be used in, or adapted for, individual circumstances. It is the classroom teacher who is best placed to consider and respond to (accommodate) the diversity of their students. Reflecting on the learning experiences offered in this exemplar will enable teachers to make appropriate adjustments (where applicable) to better cater for students' gender, personal interests, achievement levels, socio-economic, cultural and language backgrounds, experiences and local area contexts.

Using this exemplar

This teaching, learning and assessment exemplar provides suggestions to support the delivery of the mandated curriculum content. The exemplar provides:

- a teaching and learning sequence
- the mandated curriculum content to be taught at each point of the teaching and learning sequence, suggested resources, sample assessment tasks and marking keys
- the number of lessons to deliver the teaching and learning experiences
- learning intentions and support notes that may provide focus questions and additional information and/or examples to assist with the interpretation of curriculum content
- support notes to assist teachers to unpack the content and support teaching and learning experiences
- teaching and learning experiences that outline the structure of the lesson. These explicitly state each activity that the lesson will progress through and the key focus area for that activity.

Links to electronic resources

This sequence of lessons may utilise electronic web-based resources, such as videos and image galleries. Teachers should be present while an electronic resource is in use and close links immediately after a resource, such as a video, has played to prevent default ‘auto play’ of additional videos. Where resources are referred for home study, they should be uploaded through Connect, or an equivalent system, that filters advertising content.

Best practice

Teaching and learning

The teaching and learning opportunities offered in this exemplar are not exhaustive. Thus, teachers are encouraged to make professional decisions about which learning experiences, and the sequence in which they are delivered, are best suited to their classroom context, taking into account the availability of resources and student ability.

This sample may prove a useful starting point for amplifying creativity in the classroom, while presenting the embedded expectations of the Western Australian Curriculum: Science.

Teachers may find opportunities to incorporate the General Capabilities and the Cross-curriculum Priorities into the teaching and learning program.

Ways of teaching – teachers can locate additional information on the Ways of teaching from the School Curriculum and Standards Authority (the Authority) website https://k10outline.scsa.wa.edu.au/home/wa-curriculum/learning-areas/science/overview/science-ways-of-teaching.

Assessing

Assessment, both formative and summative, is an integral part of teaching and learning. Assessment should arise naturally out of the learning experiences provided to students. In addition, assessment should provide regular opportunities for teachers to reflect on student achievement and progress. As part of the support it provides for teachers, this exemplar includes suggested assessment points. It is the teacher's role to consider the contexts of their classroom and students, the range of assessments required, and the sampling of content descriptions selected to allow their students the opportunity to demonstrate achievement in relation to the year-level achievement standard. Teachers are best placed to make decisions about whether the suggested assessment/s are used as formative or summative assessment and/or for moderation purposes.

Ways of assessing – a range of assessment strategies that can enable teachers to understand where students are in their learning is available on the Authority website https://k10outline.scsa.wa.edu.au/home/wa-curriculum/learning-areas/science/overview/science-ways-of-assessing.

Reflecting

Reflective practice involves a cyclic process during which teachers continually review the effects of their teaching and make appropriate adjustments to their planning. The cycle involves planning, teaching, observing, reflecting and replanning.

This exemplar supports reflective practice and provides flexibility for teachers in their planning. The exemplar shows how content can be combined and revisited throughout the year. Teachers will choose to expand or contract the amount of time spent on developing the required understandings and skills according to their reflective processes and professional judgements about their students' evolving learning needs.

Year level description

In the middle to late childhood phase of schooling, students develop a sense of self, their world expands, and they begin to see themselves as members of larger communities. Learning experiences emphasise and lead to an appreciation of both the commonality and diversity of human experience and concerns.

Science provides opportunities for students to explore their physical, social, cultural and technological surroundings. As students develop the ability to work collaboratively, they work with others to plan and make decisions in constructing knowledge.

In Year 5, students describe the structural and behavioural adaptations of living things that enable them to survive in their environment. They model the motion and arrangement of atoms and molecules (particles) to explain observable properties of matter. Students model the relationship between the Sun and the planets in the solar system and illustrate how Earth's rotation on its axis and revolution around the Sun relate to observable cyclic phenomena. They explore light and recognise that it can be absorbed, reflected, refracted and form shadows.

Students pose testable questions that include variables to be changed and measured. They plan and conduct safe investigations and use equipment to measure and record data. Students organise and represent data to identify the relationships between variables that are measured and changed. They compare their methods and findings with those of others, and to their predictions, and report on their investigations using suitable language features. Students use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research.

Achievement standard

By the end of the year:

Students describe the structural and behavioural adaptations of various living things that enable survival in their environment. They describe and compare the observable properties and behaviours of solids, liquids and gases, and relate this to the arrangement of atoms and molecules (particles). Students model the relationship between the Sun and the planets in the solar system and illustrate how Earth's rotation on its axis and revolution around the Sun relate to observable cyclic phenomena. They identify sources of light, describe how light travels in a straight line and explain how it is reflected, refracted, absorbed, forms shadows and can be sensed.

Students pose testable questions that include variables to be changed and measured. They apply science knowledge to make predictions and, with guidance, plan and conduct safe, fair investigations to test them. Students use a variety of equipment to observe, measure and record data that they organise using tables, graphs and models to identify the relationship between variables, including using line graphs to represent continuous data. Students compare their methodology with others to determine whether investigations were fair and identify ways to improve their process. They communicate their investigation procedure, data and results in various ways. Students use science knowledge to develop considered responses to problems, at a local level, through investigation and research.

Term 1

Weeks 1–8: Physical sciences

Overview

Physical sciences Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed							
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**
Light sources and eye structure	Travelling light	Light reflection	Investigation: Refraction	Summative assessment: *Reflection, refraction, absorption* (Appendix B)	Investigation: shadows	Investigation: shadows	Translucent, transparent and opaque
Eye structure and vision	Light absorption: seeing colours	Investigation: refraction	Using refraction	Shadows introduction	Investigation: shadows	Repeated investigation: shadows	Bringing it all together: shadow puppets
Resources							
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**
• blindfolds • simple activity • torches	• mirrors • torches • prisms • coloured cellophane	• variety of liquids • popsticks • glasses • variety of reflective and non-reflective materials • torches • small toy • books	• pencil • water • eye droppers • small text • plastic protectors • convex magnifying glasses	• light placemat photocopied (Appendix B) • chalk • torches	• glue sticks • rulers • measuring sheet from Primary Connections	• torches and other light sources • small objects that can be used to cast shadows	• variety of objects • torches • materials for making shadow puppets

Term 1 Week 1

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Physical sciences** Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed **Science inquiry** **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • What can light energy be used for? • What are common sources of light? • How do your eyes work? • What is the structure of the eye? • What do the eyes need to see? • How does the eye gather light? **Support notes** Something that produces light is called a light source. Students may identify the moon as a source of light, but the moon reflects sunlight and does not have its own internal source of light. Humans see things due to light travelling from objects into their eyes. Human eyes evolved to use small amounts of light to make sense of what can be seen, but eyes generally cannot see without light. Search online for more detailed information on parts of the eye. When completing the activity in low light in the second learning experience, the students are making use of the rods in their eyes. These rods help in low light and to see black and white. If some students aren't comfortable using a blindfold, they can watch other students complete the activity.	**Learning experience 1** 1. Frantic Five Minutes – students have five minutes to write everything they know about light. Ask them to include some questions about light. 2. Introduce the term 'light source' and reinforce that a source of light needs to produce its own light, not reflect another source. In small groups, students name as many light sources as they can and share with the class to devise a master list. 3. Ask students to attempt to explain how sight is possible and the role light takes in vision. Continue to refine students' theories until an accurate explanation is devised (see support notes). 4. On the board, draw a simple diagram of an eye from the side view and use an arrow to show light travelling from an object into the eye in a straight line. 5. Working in pairs, students identify each other's cornea, pupil, iris, sclera and retina. Discuss the role of each part, adding the labels to the diagram on the board. 6. Students gently cover their eyes for approximately one minute then uncover and quickly look at their partner's pupil to see it contract. Ask students to share their ideas of why a pupil would get larger in low-light situations and smaller in high-light situations.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Resources • Blindfolds • Simple activity, e.g. jigsaws, blocks **Suggested assessment points** **Diagnostic** Observe if students can: • identify common light sources **Formative** Observe if students can: • produce an accurate diagram of the eye • produce a diagram explaining the eye of another animal • use labels.	7. Students draw their own diagram of an eye. The diagram should be labelled and show light travelling in a straight line from a light source to an object to the eye. 8. As an exit ticket, students identify three sources of light. **Learning experience 2** 1. Display a blank diagram of an eye. Ask students to come up and add a label to the diagram until all the labels have been added. Students share the role of each eye part as it is labelled. 2. Complete a *Think-pair-share* activity to discuss how eyes absorb light and send information to the brain. 3. Provide students a task to complete, such as completing a simple jigsaw, assembling blocks in a pattern or drawing a picture. Students describe how easy they found the task to complete. 4. Complete the activity again in low light; for example, with the lights off and blinds drawn. Ask students to describe how easy the activity was to complete compared to completing it in full light. 5. Using blindfolds, complete the activity a third time. Again, ask students to describe how easy they found the task compared to the other times and consider how much they rely on their sense of sight.

Term 1 Week 2

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Physical sciences** Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed **Science inquiry** **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features **Collaborating and applying** Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research	**Focus questions** • How does light travel? • How do you see colour? **Support notes** Although it can be bent and change its pathway, light still travels in a straight line. In human eyes, there are cones that help perceive colour. The primary colours of sight are red, green and blue. The cones perceive varying levels of red, green and blue to make up other colours. This is due to some of the spectrum of visible light being absorbed by an object and some of the visible light being reflected. Some resources to understand the light spectrum (the electromagnetic spectrum) can be found at: • https://spectrum.icrar.org/ • https://www.icrar.org/wp-content/uploads/2025/07/ICRAR-EM-Spectrum-interactive-poster-labels.pdf **Resources** • Mirrors • Torches • Prisms • Torches • Coloured cellophane (red, green and blue)	**Learning experience 1** 1. Review the learning on light sources and parts of the eye from the previous lesson. 2. In partners, students use small mirrors to see each other around corners. 3. Once students have been able to angle the mirror to see around corners, add a second mirror in. One partner needs to use a mirror to show an object, angled into the other's mirror so they can see the object. 4. Draw a simple diagram on the board showing the path of light from a light source > the object > the first mirror > the second mirror > the student's eye. The light has been reflected to a different path but still travels in a straight line. 5. This path of light can be seen clearly using a torch and a mirror. Ask students to shine a torch into a mirror and follow the path to which it is reflected. Add in another mirror to reflect the light again. Ask students to see how many mirrors they can add to keep reflecting the light on another path. 6. Students draw a diagram of the torch and mirrors in their journal, using straight arrows to show the path of the light. Define the word 'reflection' as a class. **Learning experience 2** 1. Shine torches into prisms and see how the light separates at the other side.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	If prisms aren't available, crystal glassware and faceted plastic crystals can split white light into colours; however, it may be harder to find the correct angle to do so. **Safety considerations** Remind students not to stare at the Sun or use mirrors to directly reflect the light of the Sun into their own or others' eyes. **Suggested assessment points** **Formative** Observe if students can: • produce an accurate diagram of light travelling in a straight line • use labels • describe how humans see colour • identify how use of the electromagnetic spectrum has helped increase astronomers' knowledge of the universe.	2. Use digital technology to take a photo of the colours visible and label them with ROYGBIV (red, orange, yellow, green, blue, indigo and violet). 3. Explain to students that these colours of the rainbow represent the part of the spectrum of light that we call visible light. There is a large spectrum of light and the part that our human eyes can see is a small part of it. Discuss how humans can see colour (see support notes) and define 'absorption/absorb'. 4. Point to some objects in the classroom and ask students to identify what parts of the visible light spectrum are being absorbed and what parts are being reflected. 5. Pose the question: What is happening when something appears like a colour that isn't red, green and blue (such as pink)? 6. Students work in pairs or small groups to place a piece of coloured cellophane over the front of a torch and shine the light onto a desk, recording the result in turns. 7. Students combine with another two groups and each shines a different colour onto the card or desk so that they overlap observing the result. 8. Discuss, as a class, that colours not in ROYGBIV are visible due to a combination of the primary colours of red, green and blue being absorbed and reflected. 9. Display a spectrum of light diagram and discuss the other types of light. Discuss the use of light in astronomy and in increasing our knowledge in this area.

Term 1 Week 3

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Physical sciences** Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed **Science inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Planning and conducting** Plan and conduct fair, safe and repeatable investigations Use equipment to observe, measure and record data **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables	**Focus questions** • Does light always travel in a straight line? • Does light move the same way through water as it does through air? • What is refraction? • How is light refracted? **Support notes** Refraction refers to light getting slowed down and bent when entering another substance. This can cause things to look a different shape or size to how they are. Refraction doesn't just occur in liquids, but in any substance. In the second learning experience, the students complete an investigation on the amount of refraction that different liquids create. Students aren't required to know about the refraction index but rather should be able to explain refraction and sort items as more or less refractive. **Resources** • Different reflective and non-reflective materials • Mirrors • Small toy • Books • *Fair test investigation* template (Appendix A) • Popsticks	**Learning experience 1** 1. Explain that some surfaces are more reflective than others. Explore how reflective some surfaces are by providing students with a set of materials and asking them to sort the materials from the least to the most reflective. Discuss student observations. 2. Explain that students will be using mirrors to reflect light around an object. Review the nature of how light travels, specifically that it goes in a straight line. Students work in small groups or pairs. 3. Provide students with the equipment and ask them to arrange the materials so that the light from the torch reflects from one mirror to the other and around the obstacle. 4. Students draw a diagram or take digital images of the set-up. Students answer these questions in their books: • How did you make the light reach the object? • How do you change the direction of the light with the mirror? • Can you predict the path that light will take if you adjust the angle of the mirror? 5. If time allows, provide the students with more mirrors and encourage them to build a light maze. **Learning experience 2** 1. On a sticky note, students write a sentence about what they think the word 'refraction' means.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	• Beakers/clear glasses • Water • Three types of liquid, e.g. oil, hand soap, syrup, salt water **Safety consideration** When choosing liquids, ensure that they are safe for students to handle. Teachers need to be aware of any medical needs or allergies the students have. **Suggested assessment points** **Formative** Observe if students can: • draw a diagram showing the path of light as it is reflected off surfaces • identify the variables to be changed, measured and kept the same • write a question and prediction that uses these variables • conduct an investigation in a safe and sensible manner.	2. Show students a popstick and then place it in a glass of water. Students crouch down so the popstick is at eye level to see how its appearance has changed. 3. Write the word 'refraction' on the board and a definition (see support notes). Students may have experienced this before in a swimming pool or looking inside an aquarium. Explain that the light is slowed down and bent when it enters a substance, such as water, glass or gemstones. 4. Pose the question, 'How do different liquids affect the way light travels?' 5. Begin planning the investigation by identifying: • What will change? (the liquid) • What will be measured? (the amount of refraction) • What will be kept the same? (the popstick, the amount of liquid, the light source). 6. Fill these variables out on the planning sheet and model how to write a question using the variables. For example, 'If I change (the type of liquid), what will happen to the (amount of refraction)?' 7. Students write a prediction that includes an explanation for their thoughts. For example, 'I think that the thicker the liquid the more refraction will occur because it will slow the light down even more.' 8. As a class, fill out the planning and conducting section of the *Fair test investigation* template including materials, method, safety risks and a diagram.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		9. Students start the investigation by taking a digital photo or drawing a picture of the popstick in the water to compare to. They then place a popstick in three other liquids and take a picture of it/draw it. 10. Once all students have completed the activity, discuss the results and place the liquids in order from most refractive to least refractive.

Term 1 Week 4

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Physical sciences** Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed **Science inquiry** **Processing modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Evaluating** Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigation **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features **Collaborating and applying** Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research	**Focus questions** • Does light always travel in a straight line? • Does light move the same way through water as it does air? • What is refraction? • How is light refracted? **Support notes** The speed of light in a vacuum is close to 300 000 km per second or about 1 billion km per hour. In air, it is slightly slower, and in water it is about 30% slower. When light slows down, it bends; this is called refraction. Other materials cause refraction, including glass and diamond. **Resources** • Glass • Water • Pencil • Eye dropper or straw • Small text • Convex lenses **Suggested assessment points** **Formative** Observe if students can: • explain their results • compare their results to their predictions	**Learning experience 1** 1. Review the meaning of refraction and examine the results of the investigation from the previous learning experience. 2. Complete a *Think-pair-share* activity where students attempt to explain their results in a sentence or two. They may choose to write this down on a whiteboard or a sticky note. 3. Ask each pair to share their sentences and encourage them to make changes if they hear an idea or word that they like. 4. Encourage students to consider the properties of the liquids that were more refractive than water. A substance's ability to refract is not dependent on how thick a liquid is but how dense it is. 5. Ask students to put their sentences into the analysing data section of the *Fair test investigation* template when they are happy with them. 6. In their *Think-pair-share* partners, students compare their results to their prediction. They may identify their prediction as being correct, incorrect or partially correct. Encourage students to think about this in terms of learning rather than being 'right or wrong'. 7. Students fill in the comparing predictions section on their investigation planner. 8. Discuss as a class whether it was a fair investigation and what could be changed. For example, one of the popsticks wasn't completely straight to begin with, or there wasn't

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	• explain why an investigation was fair or not • identify uses for the phenomenon of refraction to solve problems.	the same amount of liquid in each beaker. Fill in the last question on the investigation planner. **Learning experience 2** 1. In small groups, place a pencil in a glass of water to look at refraction again. Ask students to look at the glass from different angles, including underneath, to see how the refraction changes. Discuss how refraction is occurring with the glass and the water. 2. Discuss uses for refraction in real world settings; for example, in lenses. 3. Provide each student with a plastic sheet protector, some small print and a water dropper. Explain that they will place a water drop on the plastic sheet protector. 4. Instruct students to place the plastic sheet protector on top of the text. Ask students to predict what they think will happen. Using the dropper, students place a small drop of water onto the plastic sheet protector. Students observe the text. Ask students why they think the text appears bigger. 5. Provide each student with a convex lens such as a hand lens or magnifying glass. Ask them to use it to look at a small object and observe what happens when it is held at arm's length Show students a diagram of the way light is focused by a convex lens. 6. With students, brainstorm a list of uses for convex lenses such as projectors, spectacles, cameras, telescopes, binoculars, microscopes and magnifying glasses. 7. Relate this refraction to what the lens in a human eye does. Diagrams of this phenomenon can be found online.

Term 1 Week 5

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Physical sciences** Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed **Science inquiry** **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • How can you show your understanding of refraction, reflection and absorption? • What creates shadows? • What can change a shadow? **Support notes** The first learning experience may be used as a summative assessment for the students' understanding of the behaviour of light. Teachers are best placed to decide how to differentiate this activity for their students' needs The second learning experience is an introduction to shadows. Shadows are created when an opaque or translucent object blocks all or some of the light from a light source. **Resources** • Light placemat (Appendix B) • Chalk • Torches **Safety considerations** Remind students to never look directly at the Sun, even on a cloudy day. The position of the Sun can be determined from the direction of shadows. Advise students not to shine the torch in their own or other people's eyes.	**Learning experience 1** 1. Discuss the vocabulary covered throughout the term, specifically 'reflection', 'refraction' and 'absorption of light'. 2. Ask students to recall the practical activities and investigations they completed to learn about these terms. 3. Show students the placemat with these three terms (Appendix B) and provide instructions on how to complete it. 4. Students find a place in the room to work individually. 5. Students draw, label, write sentences and provide examples to demonstrate their understanding of these terms. 6. Play 'guess the word' where students guess the letters to scientific vocabulary they have learned this term. For example, 'refraction', 'reflection', 'absorption', 'light source', 'prism', 'spectrum', 'infrared', 'ultraviolet', 'visible', 'cornea'. **Learning experience 2** 1. Find and watch an online video of a shadow puppet play. 2. Ask students how shadows are created. Does an item need to be transparent, translucent or opaque to cast a shadow?

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Suggested assessment points **Summative assessment** • Information provided on the light placemat **Formative assessment** Observe if students can: • identify what causes a shadow • identify some things that can affect or change a shadow.	3. In partners, students go outside and use chalk to trace around their shadows on the pavement. Students mark an 'X' where they were originally standing. 4. Walk around the school to look at different shadows and relate them to the position of the light source, the Sun. The shadow is always in the opposite direction to the light source. 5. Look at and discuss any interesting shadows, such as trees with blowing leaves or translucent objects. 6. Inside the classroom, dim the lights and give each partner a torch. Students practise making shadow puppets on the wall and experiment with moving the light source closer and further, moving the angle etc. 7. At the end of the lesson, go back out to the chalk tracings and ask students to stand on the 'X' again. Look at how the shadows have changed, e.g. slightly shifted position, gotten longer and/or shorter. Students share their ideas of why this might be.

Term 1 Week 6

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Physical sciences** Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed **Science inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Planning and conducting** Plan and conduct fair, safe and repeatable investigations Use equipment to observe, measure and record data **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables	**Focus questions** • What factors can change the way a shadow appears? • How can you ensure this a fair investigation? • What is an effective way to show your data? **Support notes** Activities in this lesson are adapted from *Light shows* from the Primary Connections series at https://primaryconnections.org.au/v84-sequences/light-shows. In this investigation, students will position a glue stick in front of a measurement screen provided in the *Light shows* resource: a piece of paper printed with height measurements held vertically behind it (it is suggested to use a clipboard to hold it). Using one ruler to measure the height of the shadow, and another to measure the distance from the front of the torch to the glue stick, students adjust the distance and measure the height of the shadow. Students may need scaffolding to complete their column graph. **Resources** • *Fair test investigation* template (Appendix A) • Glue sticks • Rulers • Measuring sheet from Primary Connections (https://primaryconnections.org.au/v84-sequences/light-shows)	**Learning experiences** 1. Review shadows from the last lesson and ask students how they could change a shadow's appearance. Write the ideas on a sticky note to put on the board. For example, the type of light source, the angle of the light source or the distance of the light source. 2. Explain to students that they are going to test the effect that the distance of the light source has on shadows. Identify the sticky note with this idea and tell students it will be the variable to change. 3. All the other ideas on the sticky notes are variables that will stay the same. 4. In a *Think-pair-share* activity, students discuss what the measurable variable will be (the height of the shadow). 5. Students fill out the variables on the *Fair test investigation* template. The students use the variables to write a question and make a prediction. For example, 'When I change (the distance of the light source) will it affect (the height of the shadow)?' 6. As a class, fill out the planning and conducting section of the *Fair test investigation* template including materials, method, safety risks and a diagram. 7. Complete the investigation as detailed in the support notes. 8. Ask groups to compare their results and make a general statement of their findings. For example, the

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Suggested assessment points **Formative** Observe if students can: • identify change and measurable variables • create a testable question and reasonable prediction using prior science knowledge • investigate in a safe and reasonable manner • identify and discuss ways to display data.	closer the light source to the object, the taller the shadow will be. 9. Discuss ways to display the data in a visual form. 10. Guide students to construct a column graph including: • the X axis (the distance of the light source) and the Y axis (the height of the shadow) • axis labels • graph title. 11. Students compare their graph with others and think of a goal for how to improve their next data display. For example, having a consistent scale making titles clearer.

Term 1 Week 7

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Physical sciences** Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed **Science inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Planning and conducting** Plan and conduct fair, safe and repeatable investigations Use equipment to observe, measure and record data **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Evaluating** Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigation	**Focus questions** • Why does repeating investigations make results more reliable? • How can I design a fair investigation? • What are the variables? • What safety risks do I need to think about? **Support notes** Repeated investigations make results more reliable. They show that the same phenomena can be observed again and therefore the results can be trusted. This week instruct students to devise another investigation to show that the closer a light source is to an object, the taller the shadow. This new investigation can be very close to the previous. For example, simply changing the light source or the object making the shadow. This provides an opportunity for teachers to assess the students' ability to identify change and measurable variables and conduct investigations in a safe manner. Teachers should decide whether students fill out another set of the investigation planner template or show their investigation in other ways.	**Learning experiences** 1. Review the results from the last lesson by looking at the column graphs. Students look for patterns and write a general sentence in the evaluating section of the *Fair test investigation* template. 2. Students compare the results to their prediction and discuss whether it was a fair test. How could they have improved their investigation? 3. Introduce the concept of a repeatable test. Do they trust they will get the same result if they test the same concept again? For example, if a light source is closer to an object, does it *always* get taller? 4. In small groups, the students devise an investigation to test the same concept to ensure their results are repeatable (see support notes). 5. Discuss how students will show their new investigation, including identifying variables, writing a question and prediction, identifying safety risks. 6. Give students time to complete their investigation and compile their results. 7. Ask students to share their ideas and their results with other groups. 8. Discuss with the class the reliability of their ideas. Can they definitively say that that the closer the light source is to an object, the taller the shadow gets? Why or why not?

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Communicating Communicate ideas in a variety of ways, including scientific reports with appropriate language features **Collaborating and applying** Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research	**Suggested assessment points** **Summative** Observe if students can: • design and conduct an investigation that changes and measures a variable • conduct safety risks • compile results • communicate their results to others.	

Term 1 Week 8

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Physical sciences** Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed **Science inquiry** **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features **Collaborating and applying** Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research	**Focus questions** • What does transparent, translucent and opaque mean? • How can you use materials to produce shadows to tell a story? • How are you going to present your story? **Support notes** Transparent, translucent and opaque refers to the amount of light that a substance allows to pass through. Transparent objects allow all the light through, translucent objects let some light through, and opaque objects let no light through. In the second learning experience, the students are bringing all their learning together to make a shadow puppet play. In small groups or partners, students choose a popular fairytale or make their own story to tell using shadow puppets. Students may want to use translucent and opaque materials to make the puppets. They can also make puppets of inanimate objects to create a background. **Resources** • Torches • Variety of transparent, translucent and opaque objects • Torches	**Learning experience 1** 1. Students list as many ‘clear’ materials as they can think of and share them with the class. 2. Show them a piece of frosted glass or waxed paper and ask if it is clear. Students justify their answer. 3. Dim the classroom lights and shine a flashlight through different materials: clear plastic (transparent), frosted glass (translucent), and cardboard (opaque). 4. Ask students what they notice about how light passes through each material. Why do they think some materials let light through easily and others don’t? 5. Introduce the words ‘transparent’, ‘translucent’ and ‘opaque’. 6. Students work in pairs or small groups. Provide each group with a torch and ask them to use it on various objects in the classroom. Prompt students to consider these questions to assist with classification: • Can you see through this material? • Does the light go all the way through or does it get blocked? 7. Ask students to share their results and record these on the whiteboard. Discuss. **Learning experience 2** 1. Students use their knowledge of shadows, reflection, refraction and opaque, translucent and transparent materials to create a puppet show.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	• Materials for creating shadow puppets, e.g. paper, popsticks, cellophane, block, masking tape **Suggested assessment points** **Formative** Observe if students can: • define and identify transparent, translucent and opaque. **Summative** • Students use their science knowledge to create a cohesive story using shadow.	2. Students create puppets and props that cast shadows to retell a familiar story or create one of their own. 3. Students work in small groups or partners and present their final presentation live or via a video. 4. Encourage students to reflect on what they could have improved in their puppet show.

Term 2

Weeks 1–8: Biological sciences

Overview

Biological sciences Living things have structural and behavioural adaptations that enable their survival in their habitat							
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**
Structural and behavioural adaptations introduction	Investigation: blubber	Investigation: blubber	Fieldwork: plants and leaf coatings	Practical: plant adaptations to water	Investigation: camouflage	Indigenous understandings of adaptations	Bird beak construction
Habitat adaptations	Investigation: blubber	Australian animal research	Investigation: leaf coatings	Investigation: leaf coatings	Investigation: camouflage	Bird beak research	Bird beak construction
Resources							
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**
• sticky notes • poster paper	• thermometers • resealable bags • vegetable shortening • ice water • bowls	• books about Australian animals	• magnifying glasses • leaves • petroleum jelly • string	• leaves • pipettes • water	• four types of dried beans • cups	• *Two-Way Science* resource sheet • books on Australian birds	• long cylinder flask • plastic insect toy • seeds • bread • construction materials

Term 2 Week 1

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Biological sciences** Living things have structural and behavioural adaptations that enable their survival in their habitat **Science inquiry** **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • What do all living things require to survive? • What is meant by behavioural and structural adaptations? • What are some examples of adaptations? **Support notes** Living things have adaptations to survive in their habitat. These can be structural, behavioural or physiological. However, in Year 5 only structural and behavioural adaptations are covered. Adaptation: traits or features that enable a living thing to survive in their environment. Structural adaptations: the physical traits or features (internal or external) that enable a living thing to survive. Behavioural adaptations: actions of a living thing that enable it to survive. Adaptations occur over many generations, although it is possible for these adaptations to speed up with some factors. **Resources** • Sticky notes • Poster paper	**Learning experience 1** 1. Use a collaborative strategy to produce a list of living things. 2. Write each living thing on a separate sticky note and ask the class to work together to think of ways to classify them. For example, plants and animals, vertebrate and invertebrate, type of animal. 3. Focus on a feature of a living thing, e.g. claws. Sort all the living things that have this feature and discuss why a living thing might need this feature. In this example, claws are used for hunting, holding down prey or climbing. 4. Explain to students that features like this are called ‘adaptations’. 5. Pick a behavioural adaptation, e.g. nocturnal activity. Sort out all the living things that use this behaviour and discuss why it is useful. In this example, a living thing may be nocturnal to avoid the heat of the day or be less prone to predators. 6. Write the definition of structural and behavioural adaptations on the board and clear up any misconceptions (see support notes). 7. Display an image of a polar bear and use a collaborative strategy to allow students time to identify structural and behavioural adaptations. 8. Share ideas as a class and give students time to create a T-chart to categorise the adaptations as structural or behavioural.

Suggested assessment points

Diagnostic

Observe if students can:

- explain and give examples of adaptations
- differentiate between behavioural and structural adaptations
- demonstrate understanding of the connection between habitat and adaptations.

Structural	Behavioural
Blubber Sharp claws Black nose Small ears Clear fur Warm-blooded Two layers of fur	Walks at a slow pace Digs dens in snow Covers nose on cold days Usually solitary Excellent swimming ability Vocalisations for communication Uses body language

9. Ask some students to verbally share the reasons behind some of the adaptations of the polar bear, and how they would help a polar bear survive.

Learning experience 2

1. Explain that a habitat is a place where an organism lives. Relate back to the Year 4 content on ecosystems that include living and non-living elements. Students may hear the words 'habitat', 'ecosystem' or 'biome' referring to the same meaning.
2. Provide students with sticky notes. Place poster-size paper around the classroom with the names of a variety of habitats.
3. Students write descriptive words about each habitat on the sticky notes and stick them to each poster.
4. Students add the types of living things that are found in each.
5. Students select one animal from a habitat they discussed and gather information to answer these questions:
    - What is the habitat of the animal?
    - What are the external features of the animal?

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		• What kind of adaptations does the animal have to help it survive? • Which of these adaptations are behavioural and which are structural? 6. Students write a brief description of their animal and share it with the class. 7. Discuss any common features or behaviours that animals in the same habitat share. For example, animals in desert regions are generally light coloured, have larger ears to dissipate heat, are nocturnal etc

Term 2 Week 2

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences

Science understanding
 	
Biological sciences
Living things have structural and behavioural adaptations that enable their survival in their habitat
 	
Science inquiry
 	
Questioning and predicting
Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions
 	
Planning and conducting
Plan and conduct fair, safe and repeatable investigations
 	
Use equipment to observe, measure and record data
 	
Processing, modelling and analysing
Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables
	Focus questions
	• What adaptations do animals living in the Arctic and Antarctic share?
	• How do these adaptations help the animal survive?
	• How can you keep this investigation fair?
	• How does repeating trials improve your results?
	
	Support notes
	Blubber is the layer of fat that lots of animals living in the Arctic and Antarctic regions use to help stay warm.
	
	In this investigation, students need to fill a bowl with water and ice. They use two resealable bags, one with nothing in it and one with a thick coating of vegetable shortening or another type of fat. Students have a thermometer poking out of each bag and submerge the bags for one minute. After one minute, they take a reading from each bag to see which stayed warmer.
	
	The students should repeat this trial approximately three times to increase the reliability of their results. When completing the column graph, depending on the class context, students might want to include a column for each trial or take an average temperature across the three trials.
	
	Resources
	• *Fair test investigation* template (Appendix A)
	• Thermometers
	• Resealable bags
		Learning experiences
		1. Review some of the adaptations discussed in the previous learning experience, focusing specifically on Arctic and Antarctic animals. Highlight the common features of animals living in these regions.
		2. Many animals living in cold regions have blubber, such as polar bears, seals, whales and penguins. Ask students to speculate on why blubber may be such a common adaptation on animals living in cold regions (it helps keep the body warm).
		3. Explain that students are going to investigate whether blubber/fat is an effective adaptation to retain heat.
		4. Allow students to work collaboratively to determine the variables:
		  • change (adding blubber)
		  • measure (the temperature)
		  • keep the same (the ice water, the resealable bags, the method used).
		5. Give students time to fill out the questioning and predicting, planning and conducting sections of the *Fair test investigation* template, aiding where necessary.
		6. Before the investigation, ask students to consider how they are going to record their information in a table. Refer to prior investigations from previous

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	• Vegetable shortening or other form of fat • Ice water • Timers **Suggested assessment points** **Formative** Observe if students can: • identify the reason for blubber as an adaptation • use variables to create a testable question and prediction • conduct an investigation in a safe manner • take accurate readings and display data.	units to discuss how repeating an investigation produces more reliable results. 7. Conduct the investigation in small groups. 8. Discuss the initial results as a class and guide the students to make a column graph including: • the X axis (bag with or without fat) and the Y axis (temperature) • axis labels • graph title.

Term 2 Week 3

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Biological sciences** Living things have structural and behavioural adaptations that enable their survival in their habitat **Science inquiry** **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Evaluating** Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigation **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • How do the results compare to your prediction? • Was this a fair investigation? How do you know? • What improvements could you make to your investigations? • What are some ways that plants and animals are adapted to their habitat? **Resources** • Internet-enabled devices or books on Australian animals **Suggested assessment points** **Formative** Observe if students can: • identify patterns in their results • evaluate the fairness of their investigations with explanations • compare their results to their predictions • identify adaptations of Australian animals	**Learning experience 1** 1. Revisit the results from the investigation in the previous learning experience. In a *Think-pair-share* activity, students attempt to summarise their results with one or two sentences, including relating their findings to real world organisms. For example, the bag with the blubber in it had a higher temperature than the bag without blubber. This shows the adaptation of blubber in Arctic animals is a feature that helps keep them warm. 2. Put these sentences into the analysing data section of the *Fair test investigation* template. 3. In the evaluating section of the template, ask students to compare their results to their prediction and explain whether it was a fair investigation or not. 4. Students share their ideas with each other, particularly focusing on the reliability of results and how to improve them. 5. For an exit ticket, students write any further questions they would like to investigate due to this investigation. **Learning experience 2** 1. Share with students images of animals with similar adaptations, e.g. animals with claws, animals with wings, animals with webbed feet, animals with stripes. Ask what the animals are adapting to, e.g. respectively gripping, gliding/flying, swimming, hiding from predators.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		2. Show students an image of a bilby. Ask students to name the animal and where it is from/what its habitat is. 3. In collaborative groups, students make a list of the features of the bilby and which of these are adaptations to its environment, e.g. long ears for hearing predators/finding prey and cooling, a long snout for smelling prey. Students may need access to books or internet-enabled devices. 4. Explain to students that when animals and plants live in a habitat, those that are best at having their needs met are the ones that have more offspring and so their advantages are passed on and become part of the features of all those organisms. Stress that this takes many generations and possibly thousands of years, although it can happen faster depending on other factors. 5. Place students into small groups with an image of an Australian animal. Students undertake rapid research to identify: • What is the habitat of the animal? • What are the external features of the animal? • What physical adaptations does the animal have to its environment? • What behavioural adaptations does the animal have to its environment? 6. Students decide which information they are responsible for finding and use it to annotate the image. 7. Allow about 20 minutes and access to digital devices. 8. Display the annotated images.

Term 2 Week 4

<table>
<tr><th>Western Australian Curriculum content</th><th>Teaching and learning intentions</th><th>Learning experiences</th></tr>
<tr>
<td>
Science understanding

Biological sciences
Living things have structural and behavioural adaptations that enable their survival in their habitat

Science inquiry

Questioning and predicting
Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions

Planning and conducting
Plan and conduct fair, safe and repeatable investigations

Use equipment to observe, measure and record data

Processing, modelling and analysing
Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables
</td>
<td>
Focus questions
• What adaptations of plants do you know?
• What features can you see on these plants?
• How could those adaptations help the plant survive?
• What role does the coating of leaves play in a plant's survival?
• What are you changing and measuring?
• How can you complete this investigation safely?

Support notes
Leaves have many different coatings, depending on their habitat, that serve many different purposes. Leaves from tropical areas will be bigger and very smooth to tip water away from the roots of the plant as they get an abundance of rain. Leaves of plants from drier areas, particularly native Australian plants, are narrow with rough or matte surfaces. This helps stop moisture loss through evaporation. Some leaves from plants that grow close to the ground have a fuzzy coating that helps protect from insect activity and frost damage.

In the second learning experience the students will be setting up an investigation for the following week. They will be examining the effect that petroleum jelly has on leaves. They should see that the leaf with no extra coating is the healthiest and the leaves with petroleum jelly on both sides has shrivelled up and changed colour. The leaf
</td>
<td>
Learning experience 1
1. Direct students to brainstorm plant adaptations and, as a class, sort the ideas into structural and behavioural. Some examples are in the chart below.
<table>
<tr><th>Structural</th><th>Behavioural</th></tr>
<tr><td>Size of leaves
Shallow roots
Storing water
Thorns and spikes
Nectar and pollen
Colour of flowers</td><td>Sunflowers following the sun across the sky
Flowers opening and closing
Dropping leaves in cooler months
Stem growing towards the Sun</td></tr>
</table>
2. Walk through the school to look at plants. Pick some of the interesting leaves to look at more closely in the classroom.
3. When viewing the plants, discuss some of the interesting features observed, such as growing tall or close to the ground, spreading out leaves and tendrils, the shapes of flowers.
4. Back in the classroom, allow students time with magnifying glasses to have a closer look at the leaves collected, including their size, shape, colour and any coatings that the leaf may have.
</td>
</tr>
</table>

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	has adapted over many years to be able to function, including the leaf coating. Many leaf coatings work to stop the loss of moisture through evaporation to keep the leaf, and therefore the plants, healthier. Although coatings play an important role, more coating doesn't necessarily keep the leaf healthier. This is because leaves also respire for the plant, photosynthesise and complete other functions. When these functions are blocked, the leaves begin to wither and die. The leaf coating has adapted in conjunction with these other functions to keep the leaf and plant as healthy as possible. **Resources** • Leaves from around the school • *Fair test investigation* template (Appendix A) • Leaves without noticeable coating • Petroleum jelly • String **Suggested assessment points** **Formative** Observe if students can: • identify adaptations in plants • recognise change and measurable variables • devise a testable question and prediction based on variables • conduct an investigation in a safe and reasonable manner.	5. Discuss any features the students notice and the reasons behind those adaptations (see support notes). 6. Students choose one of the leaves and trace around it in their books. They annotate its features and explain how those adaptations may be helpful to the plant's survival. 7. Complete a gallery walk for students to see each other's ideas. **Learning experience 2** 1. Look at some of the leaves collected in the previous activity and discuss the visible adaptations. All the visible adaptations are structural. 2. Show students the collected leaves and discuss the coatings that already occur on the leaves. Review the function of leaf coatings. 3. Explain that students are going to complete an investigation to explore the adaptation and see if it can be changed. Each group will have four leaves: one will have no coating added, one will have a thin layer of petroleum jelly added to the bottom of the leaf, one will have a thin layer added to the top of the leaf and one will have a thin layer added to both sides. 4. Allow students to work collaboratively to determine the variables: • change (leaf coating) • measure (the healthiness/appearance of the leaf)

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		• keep the same (the petroleum jelly, the type of leaf, approximate size of leaf, time left) 5. Give students time to fill out the questioning and predicting, planning and conducting sections of the *Fair test investigation* template, giving assistance where necessary. 6. Before beginning the investigation, ask students to consider the potential risks and ways to mitigate them. 7. Allow students time to set up their investigation by adding the leaf coatings where necessary and then tying the leaves somewhere they won't be disturbed. 8. Instruct students to take a photo and annotate using a digital tool or draw a labelled diagram showing what the leaves look like.

Term 2 Week 5

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Biological sciences** Living things have structural and behavioural adaptations that enable their survival in their habitat **Science inquiry** **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Evaluating** Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigation **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • How will these leaves react to water? • What scientific vocabulary can you use to explain this? • Was your investigation fair? • How did your results compare to your prediction? **Resources** • Variety of leaves collected from school and the surrounding area, enough for one of each type per group • Pipettes • Water **Suggested assessment points** **Formative** Observe if students can: • make accurate and detailed observations • compare their results to their prediction • evaluate the fairness of their investigation • provide a reasonable explanation for their results.	**Learning experience 1** 1. Check on the leaves from the investigation in the previous lesson. Students make verbal observations based on what they see and then set them back up to check again later. 2. Show students the leaves you have gathered and discuss the features of each leaf. Students predict what kind of habitat the leaf might be from and what clues they have to indicate this. 3. Put students into small groups and distribute one of each type of leaf to each group. Give each group a pipette and some water. 4. Explain that students will be using the pipettes to drop some water on each leaf and see how it behaves. Give students time to record a prediction of how the water will act on top of each leaf. 5. Record any important vocabulary on the board, such as soak, slip, absorb. 6. Conduct the investigation and ask students to record a sentence next to their predictions explaining what they observed. 7. Discuss the findings and any interesting observations as a class. 8. If any groups got different results, discuss what may have caused this discrepancy and how to address any issues that have made it an unfair investigation.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		Learning experience 2 1. In their groups, students look at their leaves with the petroleum jelly. Share any interesting findings with the class. 2. Instruct students to make another annotated digital picture or draw a labelled diagram to show the changes. The diagrams should also include any changes in colour. Compare the picture or diagram to what the leaves looked like before. 3. Ask students to discuss the results in their group and explain why the extra petroleum jelly may have harmed the leaves (see support notes, Week 4). 4. Fill in the analysing section of the *Fair test investigation* template. 5. Compare the results to the prediction and explain whether it was a fair investigation in the evaluating section of the template.

Term 2 Week 6

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Biological sciences** Living things have structural and behavioural adaptations that enable their survival in their habitat **Science inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • What is camouflage? • How is camouflage a useful adaptation? • What would happen to populations that don't have adaptations to protect them from predators? • How can we display data effectively? **Support notes** Camouflage is a structural adaptation used to help animals hide from predators or sneak up on their prey. This week's activity requires teachers to prepare four types of dried beans to act as prey while the students act as predators. The play area should be a surface where at least one of the types of beans is able to blend in, e.g. a coloured carpet or speckled concrete. The focus is to show that animals that have advantageous adaptations are more likely to survive and reproduce so therefore thrive in population numbers. Animals that don't have the advantageous adaptation are likely to die out, as they are eaten before they are able to reproduce. If beans are not available, counters or similar small objects can be used. **Resources** • Four types of dried beans counted in 100 lots • Cups • Plastic toy animals	**Learning experiences** 1. Prior to the lesson, hide some plastic toy animals around the room and tell the students how many you have hidden. Given them a set amount of time to find as many of the animals as possible. 2. Once the time is up, discuss what animals were easiest to find and which were more difficult. Direct students to sort out the toys that represent animals that use camouflage as an adaptation. 3. Consider why living things might use camouflage to survive. 4. Show students the beans that will represent the prey and explain that the students will be the predators. They will have one minute to pick up one bean at a time and deposit it in a cup at the side of the play area. Explain the rules that only two fingers can be used to pick up one bean at a time. 5. Teachers spread the beans out in the play area. Place students into three groups and give the first group one minute to pick as many beans as possible. Count the amount of each bean collected. Record the results in the table.

	Black	Red	Pinto	White
1st pick				
Offspring				
2nd pick				

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Curriculum connections The data collection from this week's activity integrates with the Mathematics curriculum. Teachers could extend student understanding by asking them to calculate averages of populations or estimate population numbers moving forward. This activity also requires students to investigate the merits of different graphs and their uses. **Suggested assessment points** **Summative** Observe if students can: • explain their results and relate them to real world animal populations • explain their choices for displaying data.	<table><tr><td>Offspring</td><td></td><td></td><td></td><td></td></tr><tr><td>3rd pick</td><td></td><td></td><td></td><td></td></tr><tr><td>Total</td><td></td><td></td><td></td><td></td></tr></table> 6. Notice any patterns, such as which beans were picked the most and the least. Decide as a class the reproduction rate of the beans. For example, if there are 88 beans left, perhaps half of them of them reproduce, so add 44 more of that type of bean. 7. Add the extra beans and then have the second group complete the picking activity for one minute. 8. Count the number of beans picked, add the data to the table and add any extra beans to show reproduction. 9. Complete the picking activity for the final time with the third group. 10. Count the number of beans picked and add it to the table. Look at any patterns. Ask students to discuss and write a paragraph to answer the following questions: • Which beans were picked the most? Why do you think that is? • Which beans were picked the least? Why do you think that is? • What would happen if the investigation kept going? Would any of the bean populations become extinct?

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		• Did any beans have adaptations that helped them survive? What would happen to the populations of those beans? 11. Ask students to discuss how they might display the data in a visual representation, and the merits of a column graph and/or line graph. 12. Guide students to enter their data into a display. Instead of doing all the populations on one graph, assign students one type of bean's data to display and compare them with the others.

Term 2 Week 7

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Biological sciences** Living things have structural and behavioural adaptations that enable their survival in their habitat **Science inquiry** **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features **Collaborating and applying** Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research	**Focus questions** • What adaptations do you know about in plants? • How do Aboriginal and Torres Strait Islander people use their knowledge of plant and animal adaptations? • How does a bird's adaptations help it to eat? **Support notes** In the first learning experience students are exploring the deep knowledge that Aboriginal and Torres Strait Islander peoples have of the living things on their Country. They will explore their understanding of structural and behavioural adaptations and how these adaptations can be used. Aboriginal and Torres Strait Islander peoples have been using their knowledge of animal and plant adaptations for thousands of years. This includes using knowledge of plant adaptations to minimise water loss to identify potential water sources in dry areas. For example, the use of the Kapi tree roots or Boab trees as a source of water. A resource from *Two-way Science* from CSIRO is used in this lesson and can be accessed from the CSIRO website. Teachers are encouraged to be culturally responsive to the Aboriginal and Torres Strait Islander peoples in the class and school when discussing the topic of colonisation.	**Learning experience 1** 1. Remind students of activities they completed earlier in the term related to leaf coating and the advantages of those adaptations. 2. Explain that leaf structures can be an indicator of how plants store and minimise water loss. 3. Display the leaf pictures and information from the *Two-way Science* resource at https://www.publishing.csiro.au/book/7949 and discuss the different adaptations being shown. 4. Working with a partner, students go on a scavenger hunt to find leaves that match the adaptations on the *Two-way Science* resource sheet *Leaf guide: desert plants have special adaptations to reduce water loss.* For example, finding a thin spiky leaf or one with a waxy coating. Set guidelines for students before the scavenger hunt, such as areas to explore, how many leaves can be picked etc. 5. Give students time to complete the scavenger hunt and bring their leaves back to the classroom. 6. Compare the leaves and discuss whether the leaves do have the sought-after adaptation. 7. Identify the language group/Country that the school resides on and use prior research (see support notes) to generate a class list on how the local Indigenous groups use knowledge of plant and animal adaptations. 8. Ask students to share their findings in small groups or to the whole class.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Resources • pictures of leaves (*Two-way Science* at https://www.publishing.csiro.au/book/7949 p. 230) • internet-enabled devices or books on Australian birds **Curriculum connections** The first learning experience addresses the Cross-curriculum Priority of Aboriginal and Torres Strait Islander histories and cultures. **Suggested assessment points** **Summative** Observe if students can: • describe ways that Aboriginal and Torres Strait Islander peoples utilise their knowledge of adaptations • identify structural and behavioural adaptations • make connections between adaptations and the survival of species.	**Learning experience 2** 1. Ask students to call out possible food sources for birds and record ideas on the board. For example, nectar, insects, seeds, berries, other animals or fish. 2. Ask students if the same bird would eat nectar and fish. Encourage them to offer explanations of why this wouldn't happen. 3. Divide students into small groups and give each group a food source. Provide the groups time to consider the types of adaptations a bird would need to eat that food source. For example, a bird that eats other animals would need to have strong claws and a sharp beak, good eyesight and large wings. 4. Read or watch an online video of the book *Dig, Dance, Dive: How Birds Move to Survive* by Etta Keaner. 5. While listening, direct students to write down any adaptations they hear. 6. Once the book is finished, discuss and sort the adaptations into 'structural' and 'behavioural'.

Term 2 Week 8

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences

Science understanding
 	
Biological sciences
Living things have structural and behavioural adaptations that enable their survival in their habitat
 	
Science inquiry
 	
Communicating
Communicate ideas in a variety of ways, including scientific reports with appropriate language features
 	
Collaborating and applying
Use science knowledge to develop considered responses to problems, at a local and global lever, through investigation and research
	Focus questions
	• What adaptations does your bird beak need to have to successfully eat?
	• What changes do you need to make to your beak to make it more successful?
	• What improvements could you have made to your finished design?
	
	Support notes
	Teachers can simplify this activity by assigning certain food sources to students or choosing one type of food source that all students will build a beak for.
	
	Encourage students to test and improve their beak as many times as possible before the final testing. Give students time to reflect on their design afterwards.
	
	Resources
	• Long cylinder flask
	• Plastic insect toys
	• Seeds
	• Bread
	• Construction materials such as cardboard, straws, popsticks, pipe cleaners, masking tape.
	
	Curriculum connections
	There are strong connections to the Design and Technologies curriculum in this week's activity.
		Learning experiences
		1. Review the bird adaptations discussed in the last lesson.
		2. Explain that students are going to design and build their own bird beaks to eat a particular type of food.
		3. Show students the task their bird beak will need to complete to be successful:
		  • nectar – get down to the end of a long, thin cylinder flask
		  • insects – pick up a true-to-size plastic toy
		  • seeds – pick up actual seeds
		  • small animals – grab and tear a piece of bread.
		4. Give students time to choose a food source and draw a labelled design for their bird beak in their science journal.
		5. Students build and test their bird beak, adjusting as necessary. These changes and adjustments should be recorded in their books.
		6. Once sufficient time has been given, complete a final test with the whole class. Encourage students to be supportive and give positive feedback during this test.
		7. Ask students to reflect on their bird beak and share what went well, then ask what they would have changed if possible. This reflection can be done verbally, using a digital tool or written in their books.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Suggested assessment points **Summative** Observe if students can: • identify adaptations a bird has which enable it to eat a particular food source • make a beak design that makes sense for its food source • test and improve their design • reflect on their design and possible improvements.	

Term 3

Weeks 1–8: Earth and space sciences

Overview

Earth and space sciences The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle							
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**
Earth, Sun and Moon introduction	Constructing scaled diagrams: solar system	Sun's movements: sundials	Astronomical modelling	Seasons introduction	Indigenous seasons	Summative assessment: *Sun, Moon, Earth and other celestial objects* (Appendix C)	Investigation: craters
Orbital paths	Night and day introduction	Investigation: sun and Moon	Astronomical modelling	Displaying data: daylight hours	Moon phases	Investigation: craters	Investigation: craters
Resources							
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**
	• large paper • globe • torch	• paper • clay • pencil/popstick • compass or compass app • large and small ball per group	• materials for modelling, e.g. playdough, paper, card, split pins, foam balls	• coloured paper • graph paper or digital device to construct line graph	• torches (enough for each partner group) • balls to represent the Moon (enough for each partner group)	• assessment (Appendix C) • *Fair task investigation* template (Appendix A) • variety of round objects, e.g. marbles, soft and hard balls	• *Fair task investigation* template (Appendix A) • marbles or balls, depending on the changed variable • rulers

Term 3 Week 1

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Earth and space sciences** The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle **Science inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • What is the solar system? • What are the objects in the solar system? • What is the role of the Sun in the solar system? • Where are Earth and other planets located in the solar system? **Support notes** To model the solar system, students will stand at a distance from the person representing the Sun. To measure distances within the solar system, a unit called an Astronomical Unit (AU) is used. 1 AU is the distance from Earth to the Sun, approximately 150 million kilometres. AU is a helpful unit to use because in space the distances get large very quickly. Neptune is just over 30 AU from the Sun so, as these numbers become difficult, AU is used as a more manageable unit. The following indicates the distance from the Sun: • Mercury: 57 million km/0.387 AU • Venus: 108 million km/0.722 AU • Earth: 150 million km/1 AU • Mars: 228 million km/1.52 AU • Jupiter: 779 million km/5.20 AU • Saturn: 1430 million km/9.58 AU • Uranus: 2880 million km/19.2 AU • Neptune: 4300 million km/30.1 AU	**Learning experience 1** 1. Provide students with a series of true and false statements about observed phenomenon related to the movement of the Earth, e.g. 'the Sun orbits Earth', 'the Earth is the centre of the solar system' and 'the Earth is flat'. 2. Put students into groups of three and choose roles of 'Earth', 'Sun' and 'Moon'. In their groups they must work together to show the movement of these celestial objects as they understand it. 3. Once the groups are ready, have them perform their ideas for the rest of the class, and look for and discuss similarities, differences and misconceptions. 4. Explain that the Earth moves through space in two different ways. It rotates on its axis (rotation) and orbits the Sun (revolution). The Earth rotates and revolves counterclockwise. 5. All students pretend to be Earth and show the two movements of Earth. If possible, students can record each other and label the videos. 6. Explain that the Moon also moves in two ways, rotation and revolution. However, the rotation of the Moon takes the same amount of time it takes to revolve (or orbit) around the Earth, so we always see the same face of the Moon. The Moon also revolves and rotates counterclockwise. 7. Students return to their groups to use what they now know to act out the movement of the Sun, Earth and

	Suggested assessment points **Diagnostic** • identify misconceptions students may have around the Sun, Moon and Earth • monitor students' understanding of scale.	Moon, making changes to their original ideas, as necessary. 8. With students' help, draw a diagram on the board of the Sun, Earth and Moon using arrows to show both the rotation and revolution of the celestial objects. 9. Students copy the diagram into their books, ensuring labels and arrows are correct. 10. Ask students to call out all the planets they know and write them on the board in order from the Sun. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune. Provide a mnemonic to help them remember ('My Very Excellent Mother Just Served Us Noodles') or devise your own as a class. **Learning experience 2** 1. Ask students to recall the mnemonic from the last lesson and use it to recite the planets in the solar system in order from the Sun. 2. Introduce students to the term 'Astronomical Unit' (AU) and ask students to predict what it might be referring to. Explain the meaning and use of AU (see support notes). 3. Take students out to a large open area and designate one student as the Sun to stand in the middle of the space. Take one big pace and declare it as 1 AU, then ask a student to be Earth and stand there. Designate other students as the planets and place them in distance from the Sun using one pace as 1 AU. Alternatively, a measuring wheel can be used, and 1 metre can be equal to 1 AU. 4. Once all the planets are in place, highlight the big gap between Mars and Jupiter. The first four planets are

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		referred to as the inner planets, and the last four planets are referred to as the outer planets. 5. Students act as planets and begin to orbit the Sun at a walking pace. The rest of the students are astronomers observing the planets. Highlight how quickly Mercury orbits the Sun compared to Neptune, which takes a long time to make it all the way around. 6. Back in the classroom, discuss anything the students may have noticed about the planets, their spacing and their orbital paths. 7. Explain to students that on Earth one orbital period is 365.25 days, which is called a year. Every four years we have a leap year to make up for the extra 0.25 days. 8. Ask students to predict which planets will have an orbital period less or more than one Earth year, then ask how they know. (The planets orbiting closer to the Sun than Earth must have a shorter orbital period.) 9. Students conduct an internet search to determine the orbital periods of the eight planets in Earth years and share the results as a class.

Term 3 Week 2

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Earth and space sciences** The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle **Science inquiry** **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • How can you represent the solar system in a scaled diagram? • How does day and night occur? • What is happening on the other side of the globe when you are experiencing day? **Support notes** Scaled diagrams are not specifically mentioned in the Year 5 Science or Mathematics curriculum; however, representing data with models to identify relationships is part of the Processing, modelling and analysing sub-strand. To create an accurate scale model in this phase of schooling, students will need a large amount of scaffolding and guidance. Teachers are best placed to decide how to implement this modelling activity in the context of their class. The Sun follows a predictable path across the sky and is one of the cyclical observable phenomena caused by the movement of the Earth, Sun and Moon. A common misconception is that the Moon is part of what causes night, but it is the rotation of Earth that causes the day/night cycle. The setting and rising of the Moon is independent to that. Sometimes the Moon is visible in the daylight.	**Learning experience 1** 1. Use a *Think-pair-share* strategy to revise AU and what it means in the solar system. 2. Introduce the term 'scaled diagram' to students, explaining that they are a precise diagram showing the sizes and distances of objects in a smaller version. 3. Model to students how to start their scaled diagram of the solar system using a scale of 1 cm = 1 AU. Ask students to see if there is a problem with this scale. Students should identify that 1 cm = 1 AU is too small as Mercury, Venus and Earth would all need to fit into 1 cm. 4. In pairs, students work on their own scale diagram choosing between 2 cm = 1 AU or 3 cm = 1 AU. Encourage students to be as accurate as possible and to write their scale on their diagram. 5. Emphasise that this scaled diagram is showing the scale of the distance between planets, not the size of the planets themselves. They can show the relative sizes of the planets to each other but don't need to draw these to scale. 6. Complete a gallery walk for students to see all the diagrams. **Learning experience 2** 1. Write the words 'rotate' and 'revolution' on the board and remind students that these are the two ways that Earth moves through space. Students vote

	Resources • large paper for scale diagrams • globe • torch **Suggested assessment points** **Formative** • Explain, using scientific vocabulary, the day/night cycle	using a show of hands to indicate which one causes night and day. 2. On a sticky note, students write one sentence explaining what they think causes night and day. 3. Show students a globe of the Earth and point out that the planet is not straight up and down, it is on a slight tilt called the axis. The axis is the tilted invisible line that the Earth rotates on. 4. Find Australia on the globe. Rotate the globe slowly to show how Australia goes through one rotation. 5. Have a student hold the torch to represent the sun and observe what happens to the globe when the torch shines on it. Highlight that only half of the globe is lit up. Ask students to identify what is happening on the side of the globe lit up (daytime) and what is happening on the side of the globe in darkness (night-time). 6. Slowly rotate the globe counterclockwise to demonstrate how every day the world completes one full rotation. This ensures that the entire globe experiences night and day in a 24-hour cycle. 7. Point out that some of the globe is experiencing full sunlight and other parts are experiencing partial light, until it rotates to fully face towards or away from the Sun. Students think about what names exist for these times of day and record their ideas on the board. For example, ‘twilight’, ‘dusk’, ‘sunset’, ‘sunrise’, ‘dawn’. 8. Model how to represent the day/night cycle in a diagram on the board. Use arrows to show the Sun’s light hitting one side of the Earth, as well as the rotation.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		9. Students draw and label their own diagram. 10. Revisit the sticky note from the beginning of the lesson and ask students to write a revised sentence for what causes day and night on the back as an exit ticket.

Term 3 Week 3

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Earth and space sciences** The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle **Science inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Planning and conducting** Use equipment to observe, measure and record data **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Communicating** Communicate in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • What makes the Sun appear to move across the sky? • How is the Sun used to determine direction and time of day? **Support notes** Examples of the sundial setup can be found in the Primary Connections: *Space Innovators* unit and the *Night and Day* unit. The students should have prior knowledge that the Sun is much bigger than the Moon, but that from Earth they appear to be the same size. This is because while the Sun is approximately 400 times bigger than the Moon, it is also approximately 400 times further away. **Resources** • Paper • Clay • Popstick/pencil • Compass or compass app • Large and small ball (per group) **Suggested assessment points** **Formative** Observe if students can: • identify ways the Sun's predictable movements through the sky can enable humans to tell the time and determine directions	**Learning experience 1** 1. Watch an online video showing a timelapse of the Sun moving across the sky during a day. 2. Students use what they know about the Earth and the Sun's movements through space to predict why the Sun appears to move across the sky each day. The students should deduce that Earth is spinning/rotating and that makes it appear like the Sun is moving across the sky. 3. Take students outside to determine the location of the Sun. Remind students not to look directly at the Sun but use shadows and the feeling of heat to determine the approximate location of the Sun. 4. The Sun appears to move from east to west, so in the morning it will be in the eastern part of the sky, at midday it will be directly above and in the afternoon it will be in the western part of the sky. 5. In small groups, students discuss how past civilisations may have used this knowledge of the Sun's apparent movements to determine direction and time. 6. A clock that uses the Sun to tell the time is a sundial. Show students how to construct their own sundial with a popstick or pencil stuck to the middle of a page with clay. Mark 'east' and 'west' on the sheet. Use a compass or compass app to set the sundial facing south.

Collaborating and applying Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research	• use prior knowledge to make predictions about the size of the Moon and the Sun.	7. Draw the positions of the shadow every hour or half hour to create a sundial layout. 8. Search for images of sundials in the Southern Hemisphere to look at and compare. **Learning experience 2** 1. Students indicate with a show of hands whether they think the Sun or the Moon is bigger. Ask students to indicate whether the Sun or Moon looks bigger when viewed from Earth. 2. Show students two balls of vastly different sizes and explain that they represent the Sun and the Moon. 3. In groups of three or more students, discuss how to make the balls appear to be the same size. 4. One student in the group will roleplay as the Sun and carry the bigger ball, one will roleplay as the Moon and carry the smaller ball, and one will be Earth and direct the Sun and the Moon until they appear the same size. 5. Take the groups outside to an open space and allow them to conduct the investigation. The Earth might give instructions such as 'further', 'closer', 'higher' or 'lower' until both balls appear the same size. 6. The student representing Earth will use a digital device to take a photo of the two balls and show the group. 7. Working collaboratively, groups make the necessary changes until they are happy that the photo shows the balls appearing to be the same size. 8. Inside, the students annotate their digital picture to show the Sun and Moon and write a sentence explaining what they had to do to make the balls

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		appear to be the same size, and why in real life the Sun and Moon appear to be the same size from Earth. 9. Explain the size and distance differences as outlined in the support notes. 10. Search for and display images that show the sizes of other celestial objects in the solar system.

Term 3 Week 4

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Earth and space sciences** The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle **Science inquiry** **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features **Collaborating and applying** Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research	**Focus questions** • What causes day and night? • Where does the Sun go at nighttime? • Why is modelling important in astronomy? • How can you present your knowledge as a model? • What went well with your modelling and what would you change? **Support notes** Provide students with materials to create a model. Teachers can decide how much to limit these choices, and whether to complete the activity individually or in groups. **Resources** • Materials for modelling, e.g. playdough, paper, card, split pins, foam balls. **Suggested assessment points** **Formative** • Students identify the importance of modelling in science • Students produce a reasonable model of the Sun, Moon and Earth	**Learning experiences** 1. Individually, students complete a graffiti or brainstorm page to record everything they now know about the Sun, Moon and Earth. Share ideas as a class, and instruct students to add any missing information to their sheets. 2. Explain that astronomers and astrophysicists often use modelling to demonstrate their hypotheses and findings. Discuss as a class why modelling is so important in astronomy. (Astronomy is an observational Science, so models are required to show and predict what might happen.) 3. Students will devise a way to model the movements and attributes of the Sun, Moon and Earth. The model needs to include: • all three celestial bodies • a representation of rotation and revolution • a representation of how day and night happens. 4. Explain that students can use any available materials for example playdough, paper, split pins, foam spheres, digital tools. 5. Provide students time to plan and complete their ideas. 6. Give students an opportunity to present and explain their choices for modelling. Ask students to self-reflect on their own modelling and give themselves two stars and a wish.

Term 3 Week 5

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Earth and space sciences** The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle **Science inquiry** **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • What causes seasons? • Why do the Northern and Southern Hemispheres experience seasons differently? • How can you model the cause of the seasons? • What patterns can you see in the line graph that explains seasons? **Support notes** The most common misconception about seasons is that they are caused by the Earth getting closer to and further from the Sun. Seasons are caused by the amount of direct sunlight the Earth receives, which changes because of the tilt of the axis through the yearly orbit. Information about the average amount of sunlight for the local area can be found by an internet search or on the Bureau of Meteorology website. **Resources** • Coloured paper • Graph paper or digital device to construct a line graph **Connected learning** The use of real-world data used in the line graph could be further explored through the Mathematics curriculum.	**Learning experiences** 1. Use a digital memo-board tool or a large piece of paper for students to share their ideas about seasons and how they occur. 2. Look at a globe of the Earth and discuss the axis. Remind students that the Earth rotates around an invisible line on a tilt of 23.5°. 3. Ask a student to hold a torch, roleplaying the Sun, and another to hold the globe with Australia facing outwards towards the Sun. 4. At the starting point, look at Australia's position and note whether the axis is tilting it towards or away from the Sun. Ask students how much direct sunlight Australia would be getting in that position and what season it would be. 5. Students continue orbiting around the Sun, stopping at different times to look at the position of Australia, the tilt of the axis and the season. 6. As a class, devise a sentence to explain how seasons occur, such as, 'Seasons are caused by the tilt of the axis, causing more or less direct sunlight to hit parts of the Earth in predictable cycles throughout a year.' 7. On the board, work with students to construct a diagram that represents Earth's position in the different seasons of the Southern Hemisphere.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Suggested assessment points **Formative** Observe that students can: • create a clear diagram showing understanding of the cause of the seasons • label their diagram • use data to create a line graph.	8. Distribute coloured paper to students to construct their own diagram. The diagram must include: • the Sun in the centre • the Earth on a tilted axis in four positions • the Earth orbiting the sun in a counterclockwise direction (using arrows) • the seasons labelled. 9. As a class, look up data for the average hours of direct sunlight each month for the area the school is located. Discuss any patterns with the students and how these follow the seasons. 10. Use the data to lead students through making a line graph showing the average hours of sunlight, using graph paper or a digital tool. Students will need: • the X axis (months of the year) and the Y axis (average hours of sunlight) • a title. 11. Look at patterns in the graph and how they match up with seasons.

Term 3 Week 6

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Earth and space sciences** The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle **Science inquiry** **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features **Collaborating and applying** Use science knowledge to develop considered responses to problems, at a local and global level, through investigations and research	**Focus questions** • What things do you notice in each season? • How do Aboriginal and Torres Strait Islander peoples recognise seasons in this area? • What natural markers can you look for to indicate seasons? • How does the Moon change throughout the month? **Support notes** In the first learning experience, students are exploring the seasons based on the Aboriginal and Torres Strait Islander peoples in the local area. Focus on the concept that Aboriginal and Torres Strait Islander peoples use natural markers to indicate a change in season rather than calendar months. Information about Aboriginal and Torres Strait Islander peoples' seasons for different areas can be found on the Bureau of Meteorology website, CSIRO website or through local organisations. In the second learning experience, when students are investigating Moon phases, ensure that all resources show how the Moon appears in the Southern Hemisphere. More information about Moon phases can be found on the NASA website and can be toggled to the Southern Hemisphere.	**Learning experience 1** 1. Call out the seasons and ask students to write down the months of the year when that season occurs. Explain that the four seasons is a concept brought to Australia by the Europeans, although they occur in different months. Highlight that Western seasons are dictated by the calendar, and each season has three months. 2. In their books, students write a season in each corner of a page and then brainstorm what things they might notice during each season. For example, weather, length of days, animals, flowers or leaves falling. Discuss if these observations occur in your area or are part of a cultural belief; for example, many Australian trees shed their leaves in summer, and some places in Western Australia have a wet and a dry season where rain falls during the hotter months. 3. Share ideas as a class. 4. Identify and acknowledge the Aboriginal or Torres Strait Islander language groups of the local area and the seasons identified by these groups. 5. Explain that Aboriginal and Torres Strait Islander peoples determine the seasons by natural markers in their environment, such as trees fruiting, animals laying eggs or temperature and constellations visible in the sky, rather than the calendar months.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Some of the activities in this learning experience are adapted from the Primary Connections: *Space Innovators* unit. Visit this resource for more information. **Resources** • Torches (enough for each partner group) • Balls to represent the Moon (enough for each partner group) **Connected learning** The activities this week enable teachers to explore the Aboriginal and Torres Strait Islander histories and cultures Cross-curriculum Priority. **Suggested assessment points** **Formative** • Students make connections between western and Aboriginal and Torres Strait Islander peoples' seasons by identifying different markers. • Students conduct an investigation safely.	6. Complete an internet search or ask community members to help identify the seasons of the local area, particularly what markers might be used to identify each season and activities that could be undertaken during that time. 7. Walk around the school and look for evidence of the current Aboriginal and Torres Strait Islander season in the local area, such as insect presence and activity or lack of flowers. **Learning experience 2** 1. Ask students if they have ever viewed the Moon during daylight hours. If necessary, search for and display images of the Moon during the day to demonstrate. Reinforce that the Moon does not cause nighttime and is often seen during the day. 2. Ask students if the Moon always looks the same and if they've ever noticed times they couldn't see the Moon at all. Record any interesting vocabulary students use in their explanations. Students should deduce that the Moon does change every month. Those changes are called phases. 3. Use a digital tool, such as the NASA, Stellarium or Perth Observatory websites to view the phases of the Moon and the cyclic changes every month. 4. In partners, students assume the role of Earth and an astronaut. Give one partner a torch and the other a ball to act as the Moon. The Earth holds out the Moon at arm's length, level with their eyes, and the astronaut shines the torch onto one side of the

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		Moon. Once the torch is set up, it no longer moves; it represents the Sun. 5. The Earth then slowly rotates in a counterclockwise direction, observing how the visible part of the Moon changes as they go. 6. Swap roles and allow the other partner to observe the Moon. 7. Students share their observations. Draw a diagram on the board showing the phases of the Moon. Introduce the correct terminology. 8. Students create their own diagram in their books or use a cut-and-paste method.

Term 3 Week 7

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Earth and space sciences** The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle **Science inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Planning and conducting** Plan and conduct fair, safe and repeatable investigations	**Focus questions** • Why isn't the surface of the Moon smooth? • Why are the craters different sizes? • What could affect the size of a crater? • How could you turn your findings into a fair investigation? **Support notes** In the first learning experience, students are given an opportunity to demonstrate their learning. Teachers may choose to use this as a summative assessment task or a collaborative activity. In the second learning experience, students investigate craters and what could change their size. After initial testing in the sandpit, decide as a class what variable they will change in the next investigation. **Resources** • Assessment (Appendix C) • *Fair test investigation* template (Appendix A) • Variety of round objects, e.g. marbles, soft and hard balls **Suggested assessment points** **Summative** • *Sun, Moon, Earth and other celestial objects* assessment task (Appendix C) • identifies variables to be changed, measured and kept the same	**Learning experience 1** 1. Review the concepts covered so far in the unit: night and day, movement of the planets and Sun, Moon and Earth, seasons, Moon phases etc. 2. Explain to students that they are going to be given an opportunity to show all their ideas and understandings of the concepts. 3. Give students the instructions from the assessment (Appendix C) and answer any questions. 4. Give students adequate time to complete the task. **Learning experience 2** 1. Use the NASA website to view close images of the Moon. Discuss the surface of the Moon and its formations. The Moon's surface has many craters. Ask students to predict the cause of these craters (meteors hitting the surface). 2. Bring a variety of round objects out to the sandpit. Give students time to experiment with different variables to change the size of craters. For example, the size of the object, the material, the height of the drop or the force of the drop. 3. Back in the classroom, discuss the effect of the changes and how to turn their findings into an investigation. 4. Decide what variable to test (e.g. changing the height of the drop) and use it to plan what will be measured

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	• uses variables to create reasonable question and prediction • identifies potential risks and ways to minimise.	(the size of the crater) and what will stay the same (all the variables not chosen). 5. Complete the questioning and predicting, planning and conducting sections of the *Fair test investigation* template. 6. In groups, students devise a table to record results, including considering what measurements they will take and how. 7. Once planning is complete, each group makes a list of the equipment they need to take with them when conducting the investigation in the next lesson.

Term 3 Week 8

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences

Science understanding
 	
Earth and space sciences
The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle
 	
Science inquiry
 	
Planning and conducting
Plan and conduct fair, safe and repeatable investigations
 	
Use equipment to observe, measure and record data
 	
Processing, modelling and analysing
Organise and represent data using tables, graphs and models to identify the relationships between measured and change variables
 	
Evaluating
Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigation
 	
Communicating
Communicate ideas in a variety of ways, including scientific reports with appropriate language features
	Focus questions
	• How can you keep this investigation fair?
	• What patterns do you notice in the data?
	• How could you display the data?
	• How do the results compare to your prediction?
	• How could you improve your investigation?
	
	Resources
	• *Fair test investigation* template (Appendix A)
	• Marbles or balls, depending on changed variable
	• Rulers
	
	Suggested assessment points
	Summative
	Observe if students can:
	• conduct an investigation in a safe and reasonable manner
	• record and display suitable data
	• analyse and explain results
	• compare results to a prediction
	• explain the fairness of an investigation and how to improve it.
		Learning experiences
		1. Review any safety protocols for the crater investigation and the method students are going to follow.
		2. Bring equipment out to the sandpit and allow time for the students to conduct the investigation.
		3. Record results in tables and discuss any interesting patterns.
		4. Instruct students to decide, in their groups, whether to display their information as a line graph or a column graph and why (column graph because the data was not collected over time).
		5. Use the data to lead students through making a column graph, using the graph template in the *Fair test investigation* template or a digital tool. Students will need:
		  • the X axis (changed variable) and the Y axis (size of the crater)
		  • a title.
		6. Examine the graphs for patterns. Instruct students to describe and attempt to explain these patterns in the analysing data section of the investigation template.
		7. Compare their predictions to the results and explain whether it was a fair investigation in the evaluating section of the investigation template. Focus on how students could have improved the investigation and the reliability of their results.

Term 4

Weeks 1–8: Chemical sciences

Overview

Chemical sciences The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles)							
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**
Liquids, solids and gases introduction	Practical: solids	Investigation: liquid viscosity	Method writing	Classifying tricky substances	Investigation: gas	Investigation: carbon dioxide	Expanding and contracting gases
Introduction to particles	Solids modelling	Investigation: liquid viscosity	Liquids modelling	Investigation: gas	Gas modelling	Investigation: carbon dioxide	3D modelling
Resources							
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**
• a range of tangible materials for students to classify (see support notes) • sticky notes • ice cubes • cups of water • mirrors	• substances to be tested (see support notes)	• long cylindrical flask • honey • glucose syrup • water • dishwashing liquid • oil • measuring spoons	• collection of objects to represent particles, e.g. counters, ping-pong balls, pompoms, buttons, seeds	• set jelly • cold butter • hair mousse • equipment for testing, e.g. paper plates, pop sticks, containers • balloons • metre sticks • masking tape		• 1 empty plastic bottle (500 ml) • 1 balloon • bicarbonate of soda • ½ cup (120 ml) of vinegar • funnel • measuring spoons and cup	• empty plastic bottle with a balloon taped over the opening • bowl with boiling water • bowl with iced water • modelling materials

Term 4 Week 1

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Chemical sciences** The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles) **Science inquiry** **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • What are the three states of matter? • How does each state of matter behave? • What is matter made from? • Why are solids, liquids and gases different to each other? **Support notes** Aspects of this learning sequence are adapted from *Communicating Matters* from the Primary Connections series at https://primaryconnections.org.au/teaching-sequences/year-5/communicating-matters. **Resources** • A range of tangible materials for students to classify. These may include cork, soft plastic, rock, coins, fine sand, sugar, flour, honey, sponges, rubber bands or an empty sandwich bag, sealed and containing air. • Sticky notes • Ice cubes • Cups of water • Mirrors **Suggested assessment points** **Diagnostic** • Students' ideas written on sticky notes about properties of states of matter. • Students' understandings of particles.	**Learning experience 1** 1. Place students in groups and provide each group with a range of materials to classify. Tell them that they are to organise the materials into groups of their choosing. Ask students to share their groupings. 2. On a large Y-chart, create separate sections labelled 'solid', 'liquid' and 'gas'. Give each student three sticky notes (three separate colours) and ask them to write what they know about solids on one, liquids on another and gases on a third. 3. Prompt them with questions about how each matter behaves and to provide examples. 4. Students add their notes to the corresponding sections. 5. Students return to the collection of materials they previously sorted and create groups of solids, liquids and gases. 6. Discuss student classifications and gain consensus in the class for the classification of each material. 7. Students produce their own Y-chart in their books and put in some examples of each state of matter. **Learning experience 2** 1. Show students a cup of water and ask students to give a show of hands to indicate if it is a liquid, solid or gas and how they know it, e.g. it can be poured. 2. Ask students to consider whether water can ever be a solid or a gas.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		3. Discuss what would need to happen to turn water into a solid or a gas. Students should deduce that heat needs to be removed to make it a solid, and heat needs to be added to become a gas. 4. In small groups, students are going to investigate the three states of water. Give each group a cup of water, an ice cube and a mirror. To show water vapour, students will breathe onto the mirror. 5. Allow students time to investigate the properties of each state of matter using the items provided; for example, trying to hold it in their hands, compress it or pour it. 6. Discuss results with the class. Pose the question, 'Are all the states of water made of the same thing?' 7. Introduce the term H_2O, referring to water. It means that two hydrogen atoms and one oxygen atom have combined to make a water molecule. 8. Students show a thumbs up or down for whether each state of matter (ice, water, water vapour) is made up of H_2O molecules (thumbs up for all). 9. Explain that if the same molecules are present in each state of matter, it must be the behaviour of the molecules that is different. 10. Move to an area of the school where students can run safely. Students pretend to be water molecules and modify their behaviour for each state of matter. Solids move slowly and close together, liquids move faster and not as close, gases move very fast and far away from each other.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		11. Explain that every substance is made up of particles (molecules or atoms) and that, as these particles change behaviour due to added or removed heat, they change states (or phases) of matter.

Term 4 Week 2

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Chemical sciences** The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles) **Science inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Planning and conducting** Plan and conduct, safe and repeatable investigations Use equipment to observe, measure and record data **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • What is a solid? • What are the observable properties of solids? • What are some examples of solid substances? • How does the motion and arrangement of particles explain the properties of solids? **Support notes** Activities in this learning sequence are adapted from Search for Solids, a lesson that is part of *Communicating matters* from the Primary Connections series. It can be found at https://primaryconnections.org.au/teaching-sequences/year-5/communicating-matters/lesson-3-searching-solids. Information about the arrangement of particles in a solid can be found in the Primary Connections unit. Solids: • Definite shape • Definite volume • Not able to be compressed • Doesn't flow (if it's an individual solid; a collection of solids can sometimes be poured, such as sand, but doesn't flow)	**Learning experience 1** 1. Review the solids section of the Y-chart from Week 1 and discuss the properties students identified. Allow the opportunity to make any changes based on new understandings. 2. Show students a variety of substances to be tested and, as each is shown, ask them to verbally predict whether the item is a solid, liquid or gas. 3. In small groups, students brainstorm ways they could test the substances to find out if they are solids, liquids or gases. Share ideas with the class. 4. As a class, choose two properties to test, e.g. can the substance be poured? Does the substance keep its shape? 5. Each groups devises ways to record the results, such as diagrams, a table or using a digital tool to take pictures. 6. Allow groups time to conduct their investigations and gather data. 7. Discuss the results as class and determine which substances were solids. 8. Model and allow students to practice using evidence from the results to support their conclusions. For example, the chalk is a solid as it couldn't be poured and it kept the same shape.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Resources Per group Substances to be tested: • pourable solids such as rice, flour, laundry powder, sand • other solids such as soap, chalk, playdough, sponges, stones, wood, elastic bands, containers and at least one liquid, such as water. **Suggested assessment points** **Formative** Observe if students can: • complete practical activity in a safe manner • identify evidence of the properties of solids • produce an accurate drawing modelling the structure of molecules in solids	**Learning experience 2** 1. Discuss the results from the investigation in the last lesson and update the sticky notes on the Y-chart for solids if necessary. 2. Students copy these properties into the Y-chart in their books. 3. Remind students that all matter is made of tiny particles and that the properties of solids, liquids and gases relate directly to the arrangement of these particles. 4. Students model the movement and arrangement of particles using their fingers or by completing the water molecule activity from Week 1 in an open area. 5. Ask students how they think the particles in a solid are arranged. 6. Draw or show students a crystal lattice structure of a solid. Students copy this into their science journals. 7. Create a list of questions about solids including: • Do solids move on their own? • What are the properties of a solid? 8. Give other students an opportunity to answer these questions if possible and clear up any misconceptions that may arise.

Term 4 Week 3

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences

Science understanding
 	
Chemical sciences
The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles)
 	
Science inquiry
 	
Questioning and predicting
Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions
 	
Planning and conducting
Plan and conduct fair, safe and repeatable investigations
 	
Use equipment to observe, measure and record data
 	
Processing, modelling and analysing
Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables
 	
Evaluating
Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigations
	Focus questions
	• What is a liquid?
	• How do liquids behave?
	• What is viscosity?
	• How does viscosity affect the behaviour of liquids?
	
	Support notes
	Liquids:
	• cannot be compressed
	• flow
	• have a fixed volume
	• have no fixed shape.
	
	In this investigation, all the liquids flow and take the shape of the container they are in; however, they may do this at slower/faster rates depending on their viscosity.
	
	Viscosity refers to how thick a liquid is and how much it resists flowing. Liquids with a high viscosity will sink to the bottom of the container, while liquids with a lower viscosity will sit on top.
	
	Liquids need to be added to the container one at a time and not stirred. The results may be clearer if liquids are added in order from most viscous to least viscous.
	
	Resources
	• Long cylindrical flask
	• Honey
	• Glucose syrup (or another thick syrup)
		Learning experiences
		• Students devise a list of all the liquids they have used in the last 24 hours, e.g. water, various drinks, hand soap, shower gel, moisturisers/creams, stock.
		• Show students liquids such as liquid honey, glucose syrup, dishwashing liquid, water and vegetable oil. If students are not familiar with them, give them the opportunity to look at and smell the liquids.
		• Pose the question: What would happen if I poured all these liquids into the same container?
		• Lead students through the *Fair test investigation* template, determining:
		  • change variable – type of liquid
		  • measurable variable – how the liquids act
		  • keep the same – the amount of liquid, the container, no stirring.
		• Students use this information to create a question and a prediction. Their prediction could include a diagram if appropriate.
		• Ask students to consider and record any safety risks and how to minimise these in their planner.
		• Complete the investigation in small groups or as a class.
		• Students take a digital image and annotate or draw a labelled diagram of their results.
		• Compare the results and discuss why the liquids were stacking on top of each other instead of mixing.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences

	• Water
	• Dishwashing liquid
	• Oil
	• Measuring spoons
	• *Fair test investigation* template (Appendix A)
	
	Suggested assessment points
	Formative
	Observe if students can:
	• use variables to create a testable question
	• identify and minimise risks
	• compare results to predictions
	• identify and explain fair investigations.
		• Introduce the term 'viscosity'. Relate it to the viscosity of the liquids used in the investigation and how it affected the results. View any online materials to support these understandings.
		• Students use these understandings to explain their results in the processing, modelling and analysing section of the *Fair test investigation* template.
		• Students compare their predictions to their results and decide if it was a fair investigation.
		• Students suggest improvements or ask any other questions they may still have about liquids, such as:
		  • What causes a solid to melt? (become liquid)
		  • What happens to molecules when heated?
		  • How do liquids flow?

Term 4 Week 4

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Chemical sciences** The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles) **Science inquiry** **Planning and conducting** Plan and conduct fair, safe and repeatable investigations **Communicating** Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Focus questions** • Why is an accurate method for an investigation important? • Why are repeatable investigations important? • How do the particles in a liquid act? • Why is their behaviour different in solids and liquids? **Support notes** Planning an investigation and recording an accurate method is an important planning and conducting skill. This allows the investigation to be repeated several times by other scientists to validate the reliability of the results. **Resources** • Collection of objects to represent particles, e.g. counters, ping-pong balls, pompoms, buttons or seeds **Suggested assessment points** **Formative** Observe if students can: • construct a reasonable method that is repeatable • identify the observable properties of liquids • relate these properties to the motion and arrangement of particles in a liquid.	**Learning experience 1** 1. Engage students by viewing an online video on an 'exact instructions challenge'. 2. Model a well-sequenced method, such as a recipe. A key teaching point to address in writing a method is concise information and the correct sequencing of steps to allow for replication. 3. Write part of the method as an example with students. Consider: • correct sequencing of steps • inclusion of variables • clear and concise language that is objective • exactness or use of measurements to allow for replication of the activity. 4. Students copy the part of the method into the planning and conducting section of their investigation template and finish off any necessary steps. 5. Include a list of the resources that were necessary for the investigation. 6. Students swap their methods with another student and roleplay following their instructions exactly. If students discover that a step has been missed or needs to be clarified, they should add it into their method.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		Learning experience 2 1. Discuss the results from the viscosity investigation and update the sticky notes on the Y-chart for liquids if necessary. 2. Students copy these properties into the Y-chart in their books. 3. Discuss how the particles in liquids might be arranged and behave compared to solids. 4. View online materials on the arrangement of particles in liquids and model how to draw. 5. Students copy the model into their books. 6. Discuss what happens to make the particles change their behaviour between a liquid and solid (adding or removing heat). 7. Give students a collection of objects to symbolise particles (see resources) and ask them to make two arrangements: one showing a solid and one showing a liquid. 8. Take a digital picture and annotate it using a collage tool.

Term 4 Week 5

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Chemical sciences** The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles) **Science inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Planning and conducting** Plan and conduct fair, safe and repeatable investigations Use equipment to observe, measure and record data **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables	**Focus questions** • What are the properties of liquids? • How can you classify these objects? • What evidence can you use to support your ideas? • Is gas matter? • How can you collect evidence to find out? **Support notes** Students are focusing on using evidence to support their conclusions. Testing substances that are hard to classify will encourage students to look for pieces of evidence to support their ideas. Cold butter and set jelly are solids while hair mousse is a liquid with gas in it. Ideally, students should be able to deduce this from their tests, however the focus remains on producing evidence for any deductions they do make. In the second learning experience, students are testing whether gas is matter. The metre stick with balloons attached will dip towards the balloon with air in it. **Resources** • Set jelly • Cold butter • Hair mousse • Equipment for testing, e.g. paper plates, pop sticks, containers • Balloons	**Learning experience 1** 1. Review the properties of liquids on the Y-chart. 2. Think about substances that may be difficult to classify, like cold butter, jelly and hair mousse. Ask students to consider what kind of properties they might look for to classify a substance as a solid or liquid. For example, pouring the substances or checking if it takes the shape of the container. 3. In small groups, students will get a sample of each substance and will need to test it to come up with evidence for a classification. 4. Allow groups time to devise a plan for what tests they are going to carry out and how they will record any results. 5. Carry out tests. 6. Once tests are complete, give students time to consider how to classify the substances. 7. Students write a sentence for each substance, classifying it as a liquid or solid, and providing evidence for their statement. For example, the butter is a solid because it couldn't be poured. **Learning experience 2** 1. Pose the question, 'Is gas matter?' Students may have differing answers due to the difficulty in observing gas.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	• Metre sticks • Masking tape • *Fair test investigation* template (Appendix A) **Safety considerations** When choosing substances for the investigation in the first learning experience, consider the health needs of students. **Suggested assessment points** **Summative** Observe if students can • devise reasonable tests to collect evidence • identify variables for an investigation • create testable questions and predictions using these variables • consider safety risks when conducting investigations • record usable and accurate data.	2. Explain to students that matter is any substance that takes up space and has mass. To determine if gas is matter, those two aspects need to be tested. 3. Show students two balloons of the same size and then blow into one and tie it off. Ask students to point to the balloon that takes up more space (the one with gas in it). 4. Students are going to do the same with two balloons and attach one to either side of a metre stick. They will balance the metre stick on a finger and see which side is heavier. 5. Lead students through filling out *the Fair test investigation* template to identify: • the change variable (adding gas to one balloon) • the measurable variable (which balloon is heavier) • what was kept the same (type of balloon, measuring stick). 6. Students construct a question and prediction from these variables and fill in any of the planning and conducting sections of the template, as necessary. 7. Conduct the investigation and share initial results with the class. Digital images of the metre sticks with balloons may be helpful.

Term 4 Week 6

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Chemical sciences** The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles) **Science inquiry** **Processing modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Evaluating** Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigation **Collaborating and applying** Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research	**Focus questions** • What evidence can you use to show gas is matter? • How is your prediction the same/different from your results? • Was this a fair investigation, why? • How are the particles in gas arranged? **Suggested assessment points** **Summative** Observe if students can: • give evidence to support their conclusions • compare their results to their predictions • identify whether an investigation is fair • produce an accurate flowchart.	**Learning experience 1** 1. Review the results from the last lesson and view any digital images taken during the activity. 2. Ask students to conclude whether gas is matter using evidence from their investigation and to write an explanation in the processing, modelling and analysing section of their *Fair test investigation* template. For example, gas is matter because it expanded the balloon and was heavier than the balloon without any gas. That shows that gas takes up space and has matter. 3. In the evaluating section of the *Fair test investigation* template, students compare their results to their predictions and evaluate the fairness of the investigation. 4. Students include ways to improve their investigation. 5. Brainstorm ways that gas can be used in school, home or a business, e.g. heating water and rooms, cooking or generating electricity. **Learning experience 2** 1. Look at the states of matter Y-chart from the beginning of the term and the properties of gas sticky notes. 2. As a class, make any adjustments necessary to the ideas. Students copy the properties of gas into the Y-chart in their book.

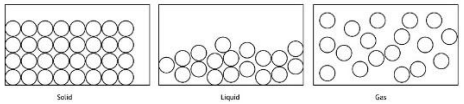
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		3. Students draw the arrangement of gas particles in their books. 4. Find and watch online videos of manufacturing carbonated drinks and discuss the role of states of matter, particularly gas, in their production. 5. Students construct a flow chart of the manufacturing of carbonated drinks, highlighting where states of matter are utilised in the charts.

Term 4 Week 7

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Chemical sciences** The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles) **Science Inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions **Planning and conducting** Plan and conduct fair, safe and repeatable investigations Use equipment to observe, measure and record data **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables **Evaluating** Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigation	**Focus questions** • What are the variables of the investigation? • How can you record your data? • How can you display your data? • Was this a fair investigation? Why? **Support notes** Students will conduct the investigation by using the following procedure: • Allocate students into groups. • Give each group a plastic bottle. • Students measure half a cup (120 ml) of vinegar using a measuring cup and pour it into the bottle. • Using a funnel, the students place two tablespoons of bicarbonate of soda into the balloon. • Without spilling the bicarbonate of soda into the bottle, stretch the balloon's open end over the mouth of the bottle. • Once the balloon is securely on the bottle, students lift the balloon so that the bicarbonate of soda falls into the bottle. • As the bicarbonate of soda mixes with the vinegar, a chemical reaction occurs which produces carbon dioxide gas. The gas inflates the balloon. • Measure the balloon's circumference and then repeat the above steps with differing amounts of bicarbonate of soda.	**Learning experiences** 1. Explain to students that they will be producing a gas by combining two chemicals: bicarbonate of soda and vinegar. Demonstrate how to add bicarbonate of soda to a balloon and how to attach the balloon to the top of a bottle by stretching it over the mouth. 2. Explain that this activity demonstrates that gas is produced and that it takes up space. 3. Explain that students will be investigating the production of gas using different combinations of vinegar and bicarbonate of soda. 4. Explain the procedure and ask students to identify the variables. 5. Demonstrate how the circumference of the balloon can be measured with a tape measure. 6. Guide students to write the plan and procedure for their investigation in the *Fair test investigation* template. Use the following information: • the changed variable: amount of bicarbonate of soda, e.g. one tablespoon, two tablespoons, three tablespoons • the measurable variable: balloon diameter • keep the same: size of bottle, quantity of vinegar, balloon size. 7. Give students time to construct a table to record their data.

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Communicating Communicate ideas in a variety of ways, including scientific reports with appropriate language features	**Safety considerations** Remind students to never mix chemicals on their own without adult supervision. **Resources** • One empty plastic bottle (500 ml) • One balloon • Bicarbonate of soda • Half a cup (120 ml) of vinegar • Funnel • Measuring spoons and cup • Measuring tapes • *Fair test investigation* template (Appendix A) **Suggested assessment points** **Summative** • Complete the *Fair test investigation* template	8. Students conduct the investigation and record data in their tables. 9. Students recount the investigation and discuss their results. What did they observe? 10. Walk students through the process of turning their data into a column graph with: • an X axis (amount of bicarbonate of soda) and Y axis (diameter of the balloon) • a graph title. 11. With students, develop a conclusion summarising the results of the experiment. 12. Evaluate by comparing the results to their predictions and determining the fairness of the investigation.

Term 4 Week 8

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Science understanding **Chemical sciences** The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles) **Science Inquiry** **Questioning and predicting** Pose testable questions that include variables to be measured, changed and apply science knowledge to make predictions **Planning and conducting** Plan and conduct fair, safe and repeatable investigations **Processing, modelling and analysing** Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables	**Focus questions** • Does temperature affect the behaviour of gas? • How can you remain safe during this investigation? • How are particles arranged in solids, liquids and gases? **Support notes** Hot water transfers more energy to the particles of gas inside the bottle and makes them move quickly and further apart, expanding the balloon. The ice water slows the particles down and brings them closer together, making the balloon contract. 3D models can be constructed from a variety of materials depending on their availability. For the particles, consider playdough, clay or small marshmallows. For the bonds, use toothpicks, straws or uncooked spaghetti  Image: Brightyellowjeans, 2017 **Resources** • Empty plastic bottle with balloon taped over the opening • Bowl with boiling water • Bowl with iced water • Modelling materials (see support notes)	**Learning experience 1** 1. Pose question: Does temperature make gas behave in different ways? 2. Students predict whether there is air in an empty plastic bottle and then predict what will happen to the balloon if the bottle is placed in hot and/or cold water. 3. Model a well-sequenced method of how the activity may be conducted. 4. Write the method as an example with students. 5. Complete a collaborative learning strategy, such as a *Think-pair-share* activity to identify two safe classroom behaviours and practices, material safety risks and risk minimisation strategies. 6. Demonstrate that air will expand and contract when placed in hot and cold water. Use a plastic drink bottle with a balloon secured to the opening. Place the bottle in hot water, where the balloon will inflate. When placed in iced water, the balloon will deflate. 7. Discuss results and compare with student predictions. 8. Identify what the behaviour of the balloons shows about the behaviour of gas and add it to the states of matter Y-chart. **Learning experience 2** 1. Find and view simple examples of visual representations of particle arrangement in solids,

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	Safety considerations Teachers should conduct the activity due to the risks involved with warm/hot water. **Suggested assessment points** **Summative** • Students identify possible safety risks and ways to minimise them. • Students produce an accurate 3D model of the particle arrangements in solids, liquids and gases.	liquids and gases, including those that show the bonds between particles. 2. Discuss the movement of these particles in each state of matter. 3. In partners or small groups, students use the materials to create 3D models of the arrangement of particles. 4. Complete a gallery walk of the models and allow students to adjust their own models after viewing others. 5. Take digital pictures and annotate them with information about the arrangement and movement of particles in each state of matter. 6. View online images of the molecular structure of common substances such as water or oxygen.

Appendix A

Resources

Fair test investigation template Name: _____

Questioning and predicting

Group members: _____

Task title: _____

State the variables for this investigation.

What I will change (independent variable)	**What I will measure** (dependent variable)	**What I will keep the same** (controlled variables)

Write the question to be investigated.

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Write a prediction for the investigation and explain why you think this will happen.

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Marking key

Description	✓
Questioning and predicting	✓
Correctly identifies the variable to be changed (independent variable)	
Correctly identifies the variable to be measured (dependent variable)	
Correctly identifies at least two controlled variables	
With guidance, poses (or writes) a question that can be investigated **OR** Poses (or writes) a question that can be investigated	
Writes a question that is reasonable	
Writes a prediction of what may happen **OR** Writes a prediction of what may happen and identifies a variable	
Provides a reasonable explanation for choosing this prediction	

Fair test investigation template Name: _____

Planning and conducting

Group members: _____

Task title: _____

List the equipment required for the investigation.

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Describe the possible safety risks in this investigation and suggest how they can be managed or controlled.

Safety risks	How they can be managed or controlled

Write the method for this investigation.

Include how the variables will be changed, measured and controlled.

Draw a labelled diagram or provide a digital representation of the equipment set-up.

Describe your observations and record your results in an appropriate table.

Table title: _____

Marking key

Description	✓
Planning and conducting	✓
Selects the appropriate equipment required to conduct the investigation	
Explains the choice of equipment required to conduct the investigation	
Identifies safety risks associated with the investigation	
Suggests ways to minimise the risks	
Provides a method for the investigation	
Provides a method which includes a logical sequence of steps	
Provides a method which includes science language and terminology	
Provides a method which contains sufficient detail Detail includes: • how the independent variable is changed • how the dependent variable is measured • how other variables are controlled • an easy-to-follow method	
Draws a clear diagram that includes: • correctly set up equipment • correct labels	
Modelling data	✓
Draws a table that includes: • a descriptive title containing dependent and independent variables • information relevant to the investigation • appropriate column headings with units of measurement (if applicable)	
Data collection is accurate	

Fair test investigation template Name: _____

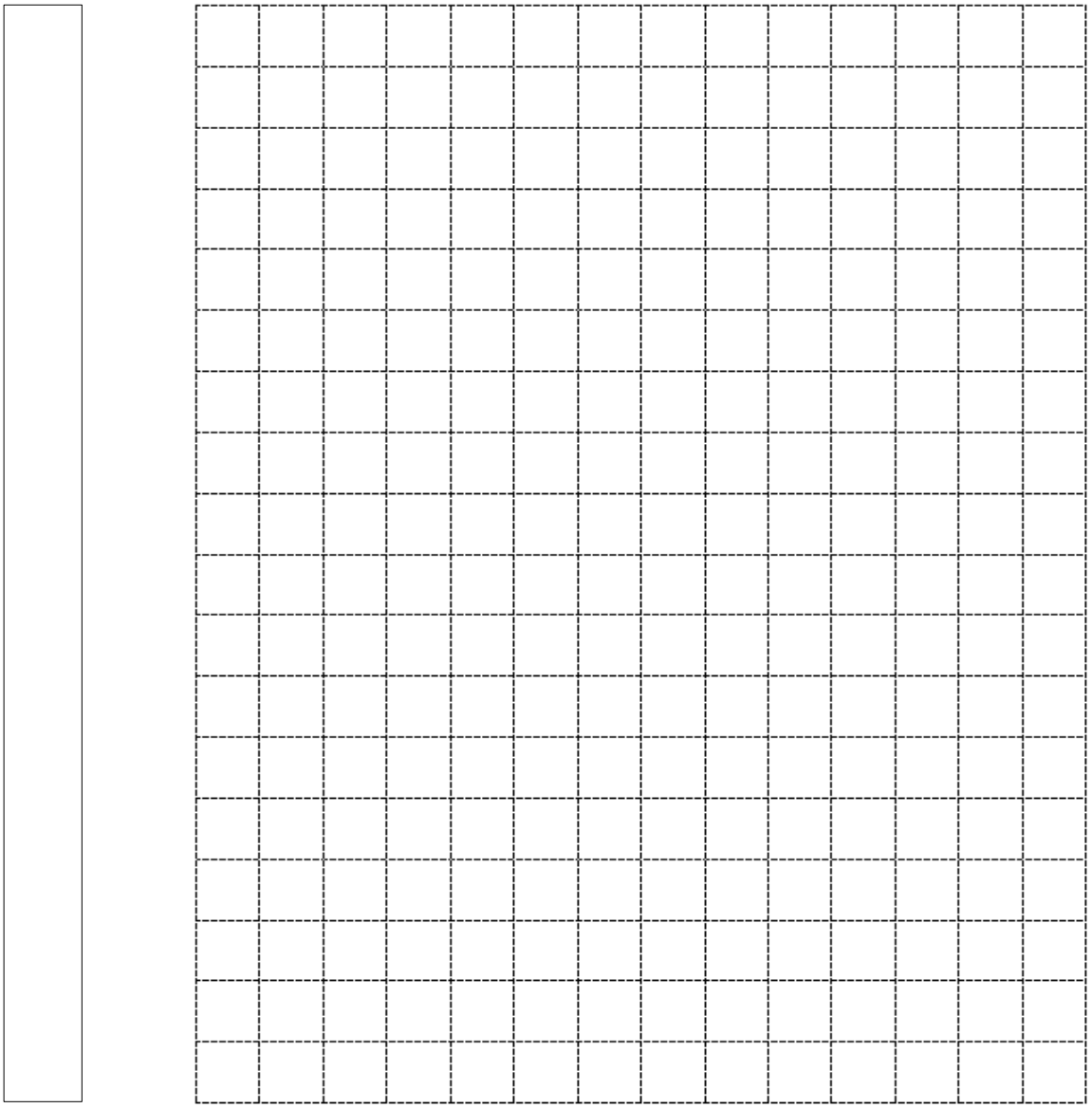
Processing, modelling and analysing

Group members: _____

Task title: _____

Graph the results of the investigation. Label each of the axes and include appropriate units of measurement.

Graph title: _____



Marking key

Description	✓
Processing, modelling and analysing	✓
Graphs results collected from the investigation (if applicable): • provides appropriate graph title • labels axes correctly • includes appropriate units of measurement • plots results correctly • draws the appropriate type of graph	

Fair test investigation template Name: _____

Processing, modelling and analysing; and Evaluating

Group members: _____

Task title: _____

Analysing data
Describe the relationships or patterns in the results.

Evaluating
Was your prediction correct? Why or why not?

Was this a fair investigation? Why or why not? How can the investigation be improved?

Marking key

Description	✓
Processing, modelling and analysing	✓
Identifies patterns in the results	
Refers to specific results when describing the relationship	
Provides an explanation or reason to explain the results	
Applies scientific ideas and understanding to the explanation	
Evaluating	✓
Compares the results to the prediction	
Identifies difficulties experienced when conducting the investigation (May include reference to, but not limited to: quality of the data, correct use of equipment, and choice of equipment)	
Identifies if the investigation was fair **Or** Provides suggestions for improving the fairness of the investigation	

Appendix B

Assessment task 1

Absorption, reflection and refraction

Task details

Title	Absorption, reflection and refraction
Description	Students have investigated the absorption, reflection and refraction of light, as well as how light travels, through a series of practical activities during the term.
Type of assessment	Summative. Teachers may include additional student work from other tasks and collate a suite of work to inform teaching and assessment.
Purpose of assessment	For students to demonstrate their understanding of how light is able to be absorbed, reflected and refracted
Evidence to be collected	Absorption, reflection and refraction placemat. Teacher may also need to ask clarify questions.
Suggested time	One 60-minute lesson in class
Differentiation	Teachers should differentiate their teaching and assessment to meet the specific learning needs of their students, based on their level of readiness to learn and their need to be challenged. Where appropriate, teachers may either scaffold or extend the scope of the assessment tasks.

Content descriptions

Science understanding

- Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed

Science inquiry

- Communicate ideas in a variety of ways, including scientific reports with appropriate language features

Task preparation

Prior learning

Students have had the opportunity to engage in practical activities and investigate how light can be absorbed, reflected and refracted. They have explored how light travels and have been exposed to appropriate scientific vocabulary.

Resources

Absorption, reflection and refraction placemat

Instructions for teacher

After engaging in the previous learning experiences, students would have been exposed to and be able to explain absorption, reflection and refraction of light. Provide students adequate time to draw and explain these concepts in three separate ways. Encourage them to include as much information as possible, including arrows to show the light travelling.

Teachers may need to ask clarifying questions of individual students to determine understanding.

Instructions to students

Absorption, reflection and refraction

In the boxes provided draw and explain how light can be absorbed, reflected and refracted. You should include:

- sources of light
- clearly labelled diagrams
- sentences to explain your thinking
- arrows to show the travelling of light
- scientific vocabulary.

Explain your ideas clearly using all your scientific knowledge.

Absorption, reflection and refraction of light Name_____

In the table below, draw and explain how each phenomenon work. Write clear and concise sentences, including as much detail as possible to explain your ideas. Drawings should be labelled and include arrows where appropriate.

Absorption	**Reflection**	**Refraction**

Marking key

Description	✓
Science inquiry: Communicating Communicate ideas in a variety of ways, including scientific reports with appropriate language features	✓
Communicates ideas clearly	
Uses appropriate scientific vocabulary	
Provides clear diagrams	
Labels all necessary features	
Uses labelled arrows to show light travelling	
Science understanding: Physical sciences Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed	✓
Includes light sources in diagrams	
Demonstrates light travelling in a straight line	
Absorption	✓
Shows in the diagram parts of the visible light spectrum being absorbed	
Shows in the diagram parts of the visible light spectrum being reflected	
Relates absorption of light to seeing colour	
Reflection	✓
Shows in the diagram a reflective surface (doesn't need to be highly reflective)	
Shows in the diagram light hitting a surface and being bent/reflected back out	
Refraction	✓
Shows in the diagram light entering a substance (e.g. glass or water)	
Shows in the diagram light being bent to change how an object looks	
Clearly explains the slowing down and bending of light	

Appendix C

Assessment task 2

Sun, Moon, Earth and other celestial objects

Task details

Title	Sun, Moon, Earth and other celestial objects
Description	Students communicate their knowledge and understanding of Earth and space sciences and describe the key features of the Sun, Moon and Earth system as well as other celestial objects in the solar system.
Type of assessment	Formative or summative. Teachers may choose to include additional pieces of work from other tasks and collate a suite of work to inform teaching and assessment.
Purpose of assessment	For students to demonstrate Science understanding of the Sun, Moon and Earth system, including cyclical phenomena
Evidence to be collected	Diagrams, written annotations and incidental verbal explanations that have been recorded by the teacher
Suggested time	One 60-minute lesson in a class
Differentiation	Teachers should differentiate their teaching and assessment to meet the specific learning needs of their students, based on their level of readiness to learn and their need to be challenged. Where appropriate, teachers may either scaffold or extend the scope of the assessment tasks.

Content descriptions

Science understanding

- The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle

Science inquiry

- Communicate ideas in a variety of ways, including scientific reports with appropriate language features

Task preparation

Prior learning

Students engaged in a range of research activities to develop Year 5 Earth and Space Sciences knowledge and understanding about the Earth and the solar system.
Students participated in a role-play simulating the solar system and other concrete tasks to conceptualise the abstract knowledge and understanding related to space.

Resources

Blank paper

Instructions for teacher

The assessment task provides flexibility in the evidence teachers choose to collect. The learning experiences provided opportunities to develop knowledge and understanding of the Earth and Space sciences sub-strand. Teachers may collect a suite of tasks including a Venn diagram, a model of the Moon's phases and an annotated diagram of the Earth as part of a system of planets orbiting the sun. This may inform teacher judgement about student achievement and understanding and promote fair and comparable judgements.

Instructions to students

Draw and annotate a diagram that shows how the Earth, Moon and Sun move through space to create cycles such as night/day, seasons and Moon phases. Consider how the Earth is part of a system of planets orbiting around a star (the Sun).

Demonstrate the science knowledge and understanding that you have learned through your research, and other tasks that you participated in.

Night and day

Include the following information:

- the position of the Sun in the solar system
- the size of the Earth and the Sun, and other features that may show the Earth as part of a system of planets orbiting around the Sun
- the Earth and the Moon: use arrows to show how day and night occur
- anything you may know about Moon phases.

Seasons

Include the following information:

- a clear diagram to represent the Earth at different parts of its orbit and the Sun
- the tilt of the axis
- correct labels such as Sun, Earth, axis
- annotations that demonstrate the cause of seasons throughout the year.

Solar system

Include the following information:

- a clear diagram that represents the solar system (consider scale of the diagram)
- correct labels such as the names of the planets, the Sun and any included moons
- an informative title
- annotations that demonstrate knowledge and understanding of Earth and space sciences and describe the key features of the Earth-Moon-Sun system.

Marking key

Description	✓
Science understanding: Earth and space sciences The movement of Earth and other planets relative to the Sun and how Earth's rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle	✓
Earth Moon Sun system (night and day)	✓
Shows Earth orbiting the Sun	
Shows the Moon orbiting the Earth	
Uses arrows to show the Earth spins/rotates (alternatively, communicates information verbally)	
Demonstrates through diagram or verbally that the part of Earth facing the sun experiences day, and the part facing away experiences night	
Describes how the Earth spins and how this results in day and night	
Identifies the different phases of the Moon	
Describes the different phases of the Moon	
Seasons	✓
Shows Earth orbiting the sun	
Shows Earth tilted on its axis	
Explains through written or verbal work that seasons are related to the amount of direct sunlight	
Solar system	✓
Places the sun at the centre of the solar system	
Draws the sun as a large object in relation to the Earth and other planets	
Positions the Moon near the Earth	
Uses arrows to show that the planets orbit (revolve around) the sun (alternatively, communicates information verbally)	
Includes some information about the other planets	
Science inquiry: Communicating Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts	✓
Diagram includes: • a relevant and descriptive title • a clear and concise illustration • use of appropriate labels • use of annotations to explain scientific concepts	

Acknowledgements

Term 4, Week 8

Support notes	Brightyellowjeans. (2017). *Solids Liquids and Gases - Particle Model* [image]. Retrieved, November, 2025, from https://commons.wikimedia.org/wiki/File:Solids_liquids_and_gases_-_particle_model.jpg Used under a Creative Commons Attribution-ShareAlike 4.0 International licence.