



Technologies: Design and Technologies

Teaching, learning and assessment exemplar

Year 5

Food and fibre production; Materials and technologies specialisations



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).

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Disclaimer

Any resources such as texts, websites and so on that may be referred to in this document are provided as examples of resources that teachers can use to support their learning programs. Their inclusion does not imply that they are 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.

This resource utilises 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.

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The Western Australian Curriculum

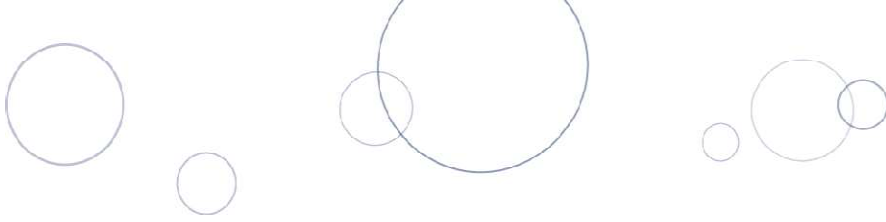
The *Western Australian Curriculum and Assessment Outline* (the *Outline* – <https://k10outline.scsa.wa.edu.au/>) sets out the mandated curriculum, guiding principles for teaching, learning and assessment, and support for teachers in their assessment and reporting of student achievement. The *Outline* 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 Technologies curriculum

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

The Technologies 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.

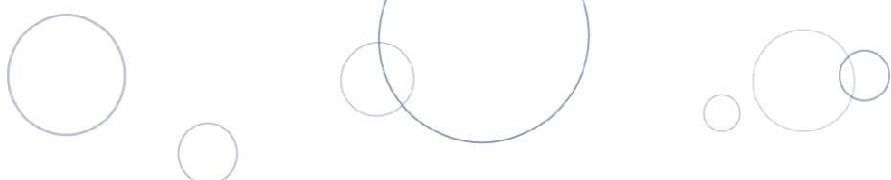


This exemplar

This Technologies 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 one hour 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: Technologies.

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 at <https://k10outline.scsa.wa.edu.au/home/wa-curriculum/learning-areas/technologies/design-and-technologies/p-10-design-and-technologies-teaching/design-and-technologies-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/technologies/design-and-technologies/p-10-design-and-technologies-assessing/design-and-technologies-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.

Design and Technologies builds on concepts previously acquired and students continue to develop an understanding of design thinking skills through collaborative planning and decision-making, and interaction with knowledgeable others. Students demonstrate an increased responsibility for project management with the implementation of agreed protocols to communicate and organise activities, individually, and in groups of varying sizes.

In Year 5, students have opportunities to learn about technologies in society, ways people in design and technologies occupations consider competing factors in the design of products, through different technologies, as they create solutions in at least one of the following Design and Technologies contexts: Engineering principles and systems, Food and fibre production, Food specialisations, and Materials and technologies specialisations. Students are provided with opportunities to produce products, services or environments, and develop an understanding of designing solutions, considering features, such as the repurposing of components, sustainable factors and regenerative practices.

Students develop strategies to manage and communicate information and ideas using agreed ethical protocols and consider the safety aspects of working with others. They break down design briefs to define the purpose and requirements for a given task and designed solutions, considering competing factors with annotated diagrams and a sequence of steps, using technical terms and an iterative process. Students use management roles to communicate decisions, plan and manage time to develop a designed solution and reference the given criteria to evaluate.

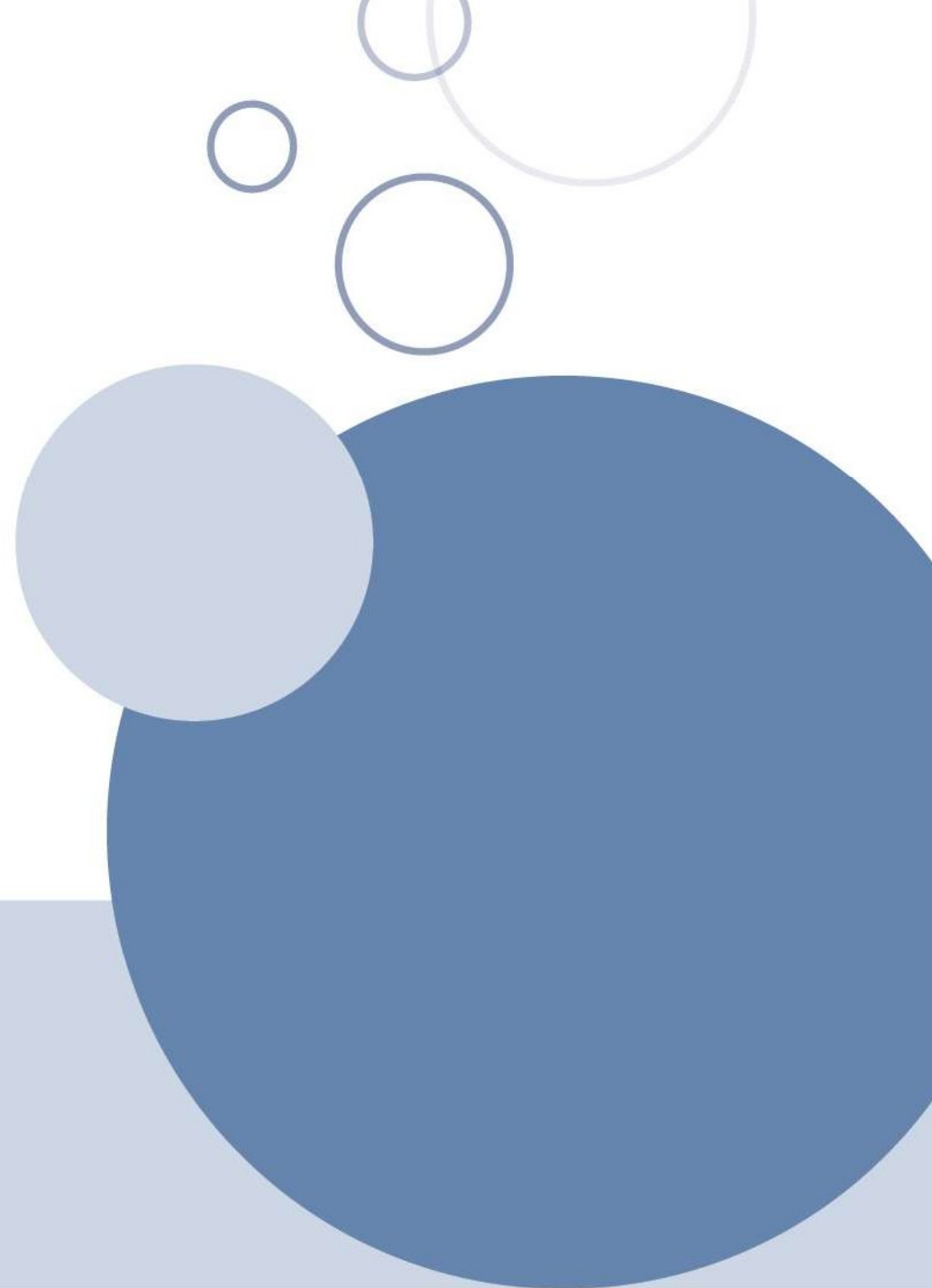
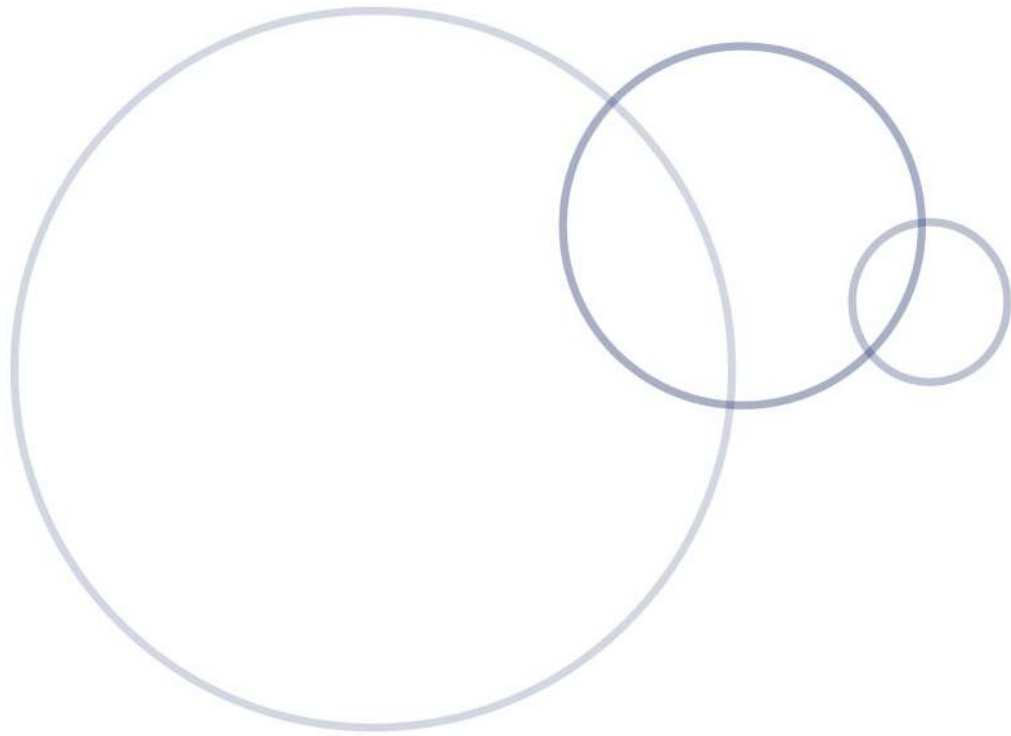


Achievement standard

By the end of the year:

Students identify ways people in Design and Technologies occupations consider competing factors in the design of products, services and environments. In Engineering principles and systems, students distinguish various ways forces control movement, sound or light in a product or system. In Food and fibre production, students identify ways to improve efficiency of production systems, considering sustainable factors for food and natural fibre products. In Food specialisations, students implement food preparation systems, considering ways food safety affects the selection of food for designed solutions. In Materials and technologies specialisations, students consider the properties for a range of materials, suitable components and use of appropriate technologies to achieve a designed solution for an identified purpose.

In the Design and Technologies contexts, students break down a design brief to define the purpose for a given task, including required resources, technologies and components. They manage and communicate alternative ideas using annotated diagrams and storyboards applying appropriate technical terms for designed solutions. Students use management roles to plan, manage time and communicate decisions, and implement agreed protocols when using technologies and components to produce a designed solution. They use given criteria to evaluate design features, competing factors and the sequence of steps used.



Term 1

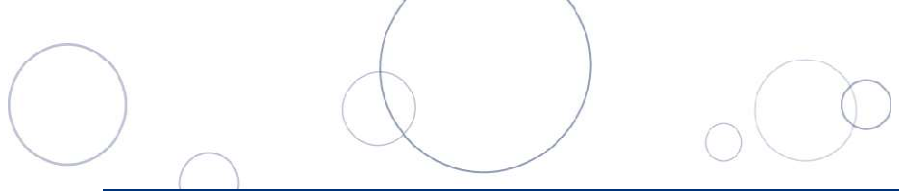
Weeks 1–8: Food and fibre production

Term 1 Week 1

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p>	<p>Learning intention To understand how community gardens contribute to positive sustainable environments.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What is a community garden? • Why might a food garden be a sustainable choice when planting? <p>Support notes Appendix A.1 contains additional materials that may assist in beginning discussions about the purposes of and need for community gardens.</p> <p>Suggested assessment point Formative exit ticket reflecting on the benefits of sustainable practices when gardening.</p>	<p>Introduction Discuss what a community garden is and how community gardens work. Watch a video from ABC's Gardening Australia to introduce the concept of community garden plots.</p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=DTsGaaTbJ6o <p>Reflect on how the garden provides a range of services that meet community needs. Consider the comment from the Foodbank staff member about the services being 'cost zero'. What did she mean by this? Why would this create a more sustainable service for the community?</p> <p>Discuss the need of the local community for affordable food boxes and why community gardens growing food would be more effective in meeting this need than other plants.</p> <p>Collate ideas as a class. Present all ideas visually for students and save this for the next lesson.</p> <p>Learning activity Students work in small groups to conduct a SWOT (strengths, weaknesses, opportunities, threats) analysis on the role of community gardens in Australia. Students focus on the opportunities to consider for the school's local environment.</p> <p>Conclusion Students complete an exit ticket, noting what they think is the biggest benefit of sustainable practices when creating a community garden.</p>

Term 1 Week 2

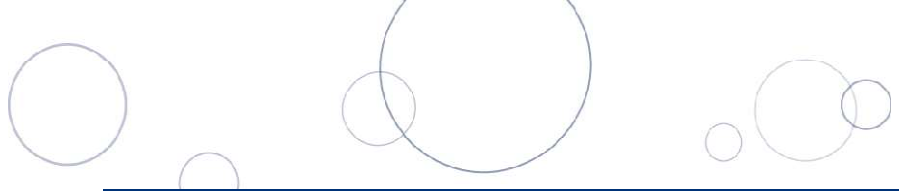
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p>	<p>Learning intention To explore the factors to consider when setting up a community garden.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What are the elements of a community garden? • What environmental factors need to be taken into consideration when planning a community garden? <p>Support notes It may be possible to apply for sustainability grants from individual councils within Western Australia.</p> <p>See the City of Cockburn for inspiration.</p> <ul style="list-style-type: none"> • https://thesector.com.au/2019/01/31/childcare-centre-uses-popular-childrens-book-to-create-community-garden/ <p>Suggested assessment point Use the group brainstorm starbursting task as a formative assessment to gauge students' understanding of what is required to set up a community garden.</p>	<p>Introduction</p> <p>Reflect on the class-developed SWOT analysis from the previous lesson. Highlight the benefits students identified in their exit tickets and the possible opportunities in the school's local area.</p> <p>Explain to the students that this lesson will focus on what is needed to set up a community garden.</p> <p>Explore a local case study where Gardening Australia examines a school in the Swan Valley that created a community garden to suit their environment.</p> <ul style="list-style-type: none"> • https://www.abc.net.au/gardening/how-to/creating-a-school-garden/9427752 <p>Learning activities</p> <p>Students work in small groups to explore the information from: ABC Kids community garden</p> <ul style="list-style-type: none"> • https://www.abc.net.au/abckids/early-education/family-community-and-culture/play-school-where-i-belong-community-garden/13275036



Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		<p>Explore and discuss the information from the <i>Edible School Garden Planting and Maintenance Guide</i> by the Waste Authority of Western Australia. This has a focus in the Technologies and society strand where gardeners consider factors specific to Western Australian requirements for what is good to plant at different times of year.</p> <ul style="list-style-type: none">• https://www.wasteauthority.wa.gov.au/images/resources/wss/Files/2019/10/Edible_Garden_Planting_and_Maintenance_Guide.pdf <p>Students use the brainstorming strategy starbursting, placing the main topic in the middle of the star, and the outside of each point of the star references the who, what, where, when, why, how of the project to be undertaken.</p> <p>Conclusion</p> <p>If time permits, students share their brainstorms in a class starburst chart.</p>

Term 1 Week 3

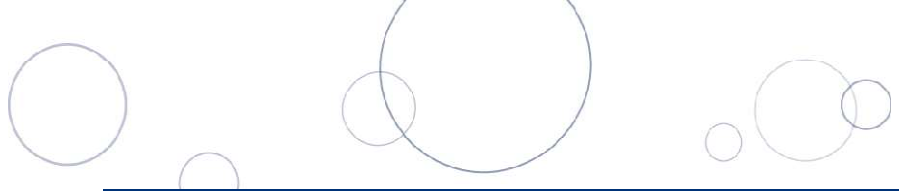
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p>	<p>Learning intentions</p> <p>To understand the sustainability factors when planting for various seasons.</p> <p>To consider how food waste can create successful compost.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What role do the seasons play in the design of a food garden? • How does this impact your local area? • How might compost factor into a food garden? <p>Suggested assessment point</p> <p>Use students’ research on composting as a formative guide of their understanding of the impacts of food waste on sustainability.</p>	<p>Introduction</p> <p>Reflect on the starbursting brainstorming activity from the last session, including the Waste Authority WA website information about planting at different times of the year. Encourage students to consider these tips and why this is so important in Western Australia. Reflect on how planning the community garden would differ if they were planning in Esperance compared to Perth, Broome or locations specific to the students’ knowledge and experiences.</p> <p>Discuss the school’s local area. What considerations need to be made for the environment in this area? Identify the seasons and compare with the seasons of the Aboriginal people in the area. How can these seasons impact the planning of gardening and planting?</p> <p>See Appendix A.1 for information on the seasons of your school’s local area. The following resource discusses the six Noongar seasons of Perth:</p> <ul style="list-style-type: none"> • https://www.abc.net.au/gardening/how-to/noongar-6-seasons/13841376 <p>Discuss the concept of composting and how this might positively impact the cycle of growth within a community garden.</p> <p>View the composting clip from Gardening Australia to understand the process of setting up a compost station in a garden</p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=lGynzcwXZk4



Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		<p>See Appendix A.1 for additional websites with Food Waste and Zero Waste initiatives in Australia that provide information on planting food items in community gardens.</p> <p>Learning activities</p> <p>Students return to their original starbursting groups from the previous lesson and add considerations specific to the Aboriginal area of the school, noting how the seasons may impact what can and will grow in the area.</p> <p>Students explore how composting can help reduce food waste and become a process that will foster sustainable practices for gardening and food.</p> <p>See Appendix A.1 for additional information.</p> <ul style="list-style-type: none"> • Food waste AU resource https://www.foodbank.org.au/food-waste-facts-in-australia/?state=au • Zero waste AU initiatives Zero Waste Initiative For Community Gardens Community Gardens Australia <p>Students work in small groups to conduct research on the ways composting could impact sustainability and the various methods for setting up a composting garden.</p> <p>Conclusion</p> <p>Student groups sit in pairs and discuss the results of their research.</p>

Term 1 Week 4

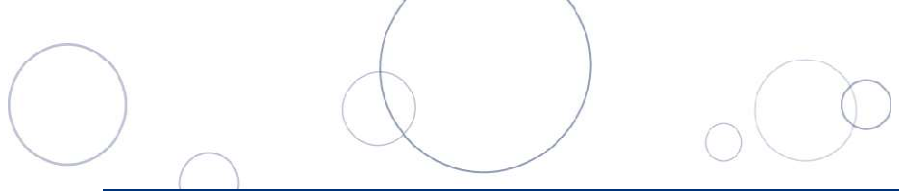
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p> <p>Design thinking skills</p> <p>Project management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Investigating and defining Break down a design brief to define the purpose and requirements for a given task Investigate and select resources based on properties and functions for the given task</p> <p>Designing Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process</p>	<p>Learning intention To design a dream community garden appropriate to the school context.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What are the main elements of a successful community garden at the school? • What is needed to enhance the school environment's gardening ability? <p>Suggested assessment point Annotated sketches can be used as formative assessment of students' ability to design solutions.</p>	<p>Introduction Reflect on the teaching and learning from the three previous lessons. Encourage students to consider the local school context, and how this information might assist in designing a dream community garden at the school.</p> <p>Consider the focus questions when discussing the task to design their dream community garden for the school.</p> <p>Learning activities Students work individually or in pairs to design a dream school community garden. This can be as grand as they like and they can create a wish list of an ideal gardening situation for the school, regardless of budgets or resources. The focus is that the design must suit the local context.</p> <p>Students sketch and annotate their ideas for each area of the community garden. A bird's-eye view photo or screenshot from online maps may assist students in visualising where on the school premises they could set up various parts of their community garden.</p> <p>Appendix A.1 provides additional information on planning a community garden.</p> <ul style="list-style-type: none"> • Sustainable gardening Australia https://www.sgaonline.org.au/a-schools-sustainable-gardening-adventure/ • Junior Landcare food garden https://juniorlandcare.org.au/learning_activity/creating-a-food-garden-vision/



Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		<p>Students may choose to use the free online garden plotting software for a visual of their design.</p> <p>Note: a free teacher account is required to set up the anonymous student profiles.</p> <ul style="list-style-type: none">• https://vegplotter.com/schools <p>Conclusion</p> <p>At the completion of the planning, facilitate a gallery walk where students can view and ask questions about each other's ideas and designs.</p>

Term 1 Week 5

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p> <p>Design thinking skills</p> <p>Project management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Investigating and defining Break down a design brief to define the purpose and requirements for a given task Investigate and select resources based on properties and functions for the given task</p> <p>Designing Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process</p>	<p>Learning intention To design in detail a section of a community garden or composting area that is appropriate to the school context.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What element of your community garden design would be helpful in the school context? • How might this positively impact the school community? • What materials are required to complete your design, and how might you source them? <p>Support notes Consider requests for assistance with resources from community members and local gardening and hardware stores, prior to subsequent learning experiences. Family volunteers should also be considered at this stage, if required.</p> <p>Suggested assessment points This and the following three lessons will form the major summative assessment task for the term. For additional information, see Assessment task 1 (Appendix B).</p>	<p>Introduction Reflect on the gallery walk from the previous lesson where students viewed a variety of dream community garden designs for their school. Introduce the task for the next four lessons: to design, build and evaluate one aspect of a community garden that could be implemented in the school context.</p> <p>Ask students to choose a section that suits their context to design in more detail with annotations; for example, chicken coop, compost, worm farm, considering what items are available within the school and what items may be able to be sourced from home, from donations of local gardening stores and so on.</p> <p>Encourage students to make selections based on what they believe can be achieved in reality, based on available resources.</p> <p>View the <i>Running a garden project</i> resource and click through each slide for tips and ideas on how to choose/ what to plan. https://www.fao.org/4/a0218e/A0218E02.htm</p> <p>See Appendix A.1 for more details.</p> <p>Learning activities Students work individually, in pairs or small groups (depending on the resources available and the size of the task chosen). Students may need to begin with a process of rapid ideation and hot dotting within their group to finalise</p>



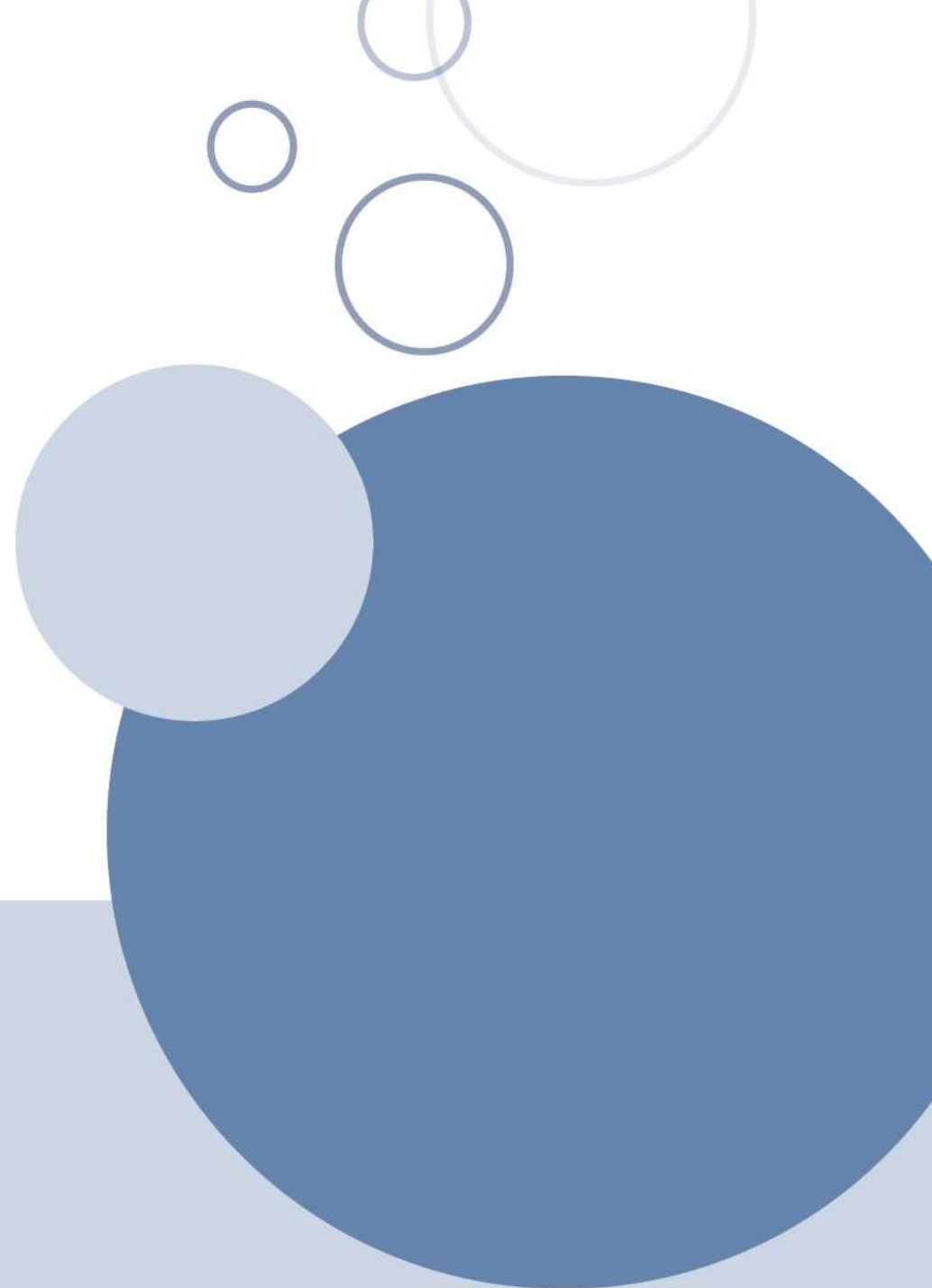
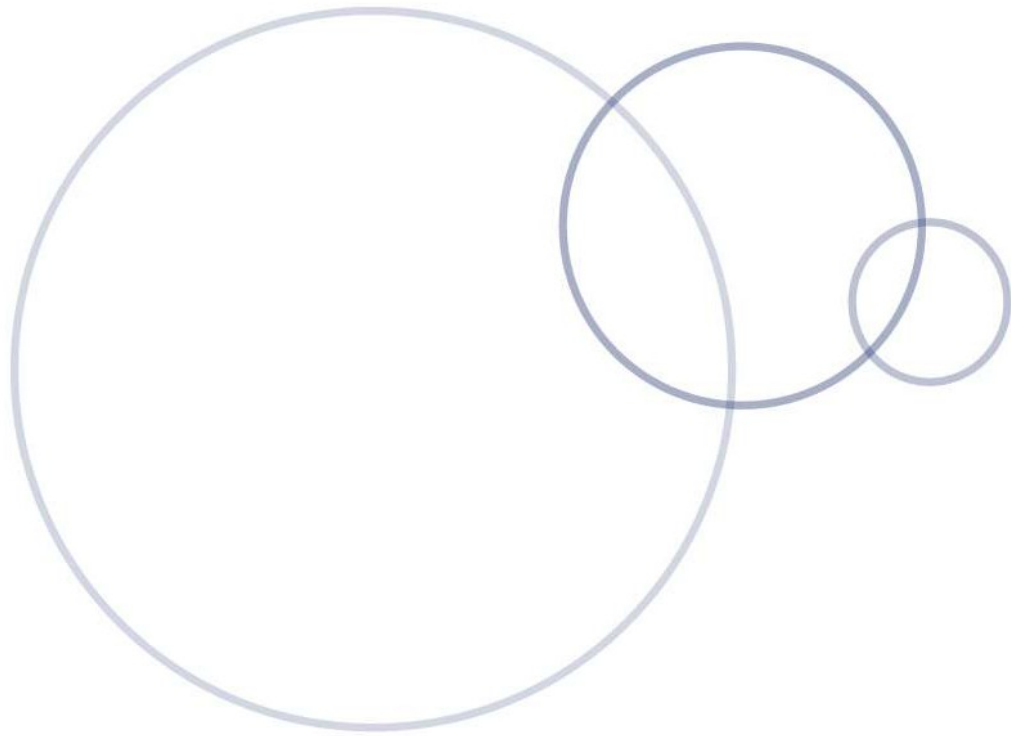
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		<p>their thought processes into one idea that will work for their school.</p> <p>Using Assessment task 1 (Appendix B), students plan the section of a community garden that they will implement in the school. This design process should involve annotated diagrams of their plans, the possibility of a storyboard or sequence of steps (depending on the type of task chosen), and descriptions of what is needed to complete the task.</p> <p>Conclusion Students discuss their individual roles in the task to ensure that each student is clear about what needs to be completed and when, and where resources will be sourced from.</p>

Term 1 Weeks 6–7

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p> <p>Design thinking skills</p> <p>Project management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Producing and implementing Use technologies, components and/or equipment to implement agreed protocols to produce a designed solution</p>	<p>Learning intention To create a section of a community garden working in a small group following the design plans.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What roles will each group member take in planning and construction? • What technologies need to be used in the construction of the section of the community garden? • What ongoing management will be required to maintain food/plant growth? <p>Support notes Ensure students have access to safety equipment prior to building and planting.</p> <p>Suggested assessment points Opportunity to note if students are working from their designs, and their ability to work in a team and project manage tasks effectively.</p>	<p>Introduction Provide students with basic gardening resources acquired previously; for example, soil and some seeds or seedlings.</p> <p>Discuss with students that during this and the following learning experience, they will be building and planting their part of the community garden.</p> <p>Prompt students to follow their assigned roles for the lessons. What group tasks are needed based on the planning? What individual tasks have been assigned to each student?</p> <p>Discuss the safety expectations and the rules for moving around the school depending on the chosen tasks. Discuss what safety equipment will need to be worn when building or planting.</p> <p>Learning activity Students begin building their community garden areas, including appropriate signage to keep other students away while the gardens are establishing.</p> <p>Conclusion Students work collaboratively to clean the areas and display signage.</p>

Term 1 Week 8

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Design thinking skills</p> <p>Evaluating Use given criteria to evaluate design features, with consideration of competing factors, processes and the designed solution</p>	<p>Learning intention To reflect on the success of the design and construction of the section of a community garden section.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What elements (if any) of the design changed in the building phase? • How successful were you in designing something to suit the school's needs and context? • What element of sustainability does your section of a community garden section explore? <p>Suggested assessment point Summative assessment of student learning, using the reflection documents and marking key (Appendix B).</p>	<p>Introduction</p> <p>Take a gallery walk around the learning area or school to see the completed aspects of the community garden that have been set up. If possible, provide students the opportunity to take photographs.</p> <p>Return to the classroom and encourage students to reflect on what they planned and completed over the last three lessons. Ask students to consider how might they evaluate the success of the community garden.</p> <p>Using a group brainstorm, identify at least three commonly agreed criteria that students may use to evaluate their work. Emphasise that constructive feedback is part of the learning process.</p> <p>Learning activity</p> <p>Students individually use the reflection document to evaluate their task. If possible, provide opportunity for students to take photos of what they have completed and include annotations and ideas for what they liked/might improve were they to do it again.</p> <p>Conclusion</p> <p>Provide time at the conclusion of the lesson for students to create an ongoing schedule for maintenance of the community garden.</p>



Term 2

Weeks 1–8: Food and fibre production

Term 2 Weeks 1–2

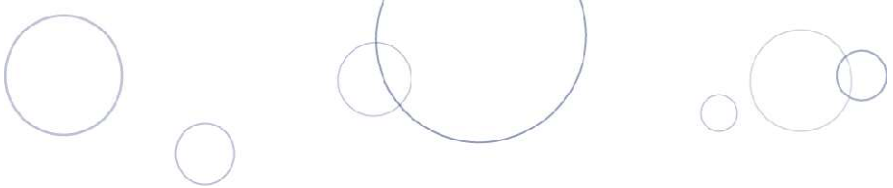
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society Technologies are used in the design of products, and implementation of services and environments</p>	<p>Learning intentions To understand how and why recycled paper is produced.</p> <p>To compare the advantages or disadvantages of recycled paper versus non recycled paper.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What are the advantages or disadvantages of recycled paper? • What are the advantages or disadvantages of paper made from wood? <p>Support notes While trees used to make paper are sourced from farms, sustainability and the environment are competing considerations in paper production.</p> <p>When providing paper for students to examine, ensure a range of from high to low quality is provided.</p> <p>Suggested assessment point Use the responses from group discussion as formative assessment of student understanding of the advantages and disadvantages of paper made from wood.</p>	<p>Introduction 1 Ask the question: Where does the material used to make paper and cardboard come from?</p> <p>Watch the video (Appendix A.2) showing the process of turning wood into paper. Highlight the production stages in the video.</p> <p>Learning activity 1 In groups, discuss the advantages and disadvantages of using paper made from wood.</p> <p>Introduction 2 Select and watch one of the videos (Appendix A.2) about making recycled paper (mass production). Highlight the process of paper recycling, noting the technologies used as they arise.</p> <p>Assign students to groups. Give each group several sheets of paper: half made from wood and half from recycled paper. Separate the recycled paper from the not recycled, using a folder for each type. Students discuss any differences they note between the two types of paper.</p> <p>Learning activity 2 In groups, complete a retrieval chart to compare the two paper types.</p> <p>Conclusion Groups share responses with the class. Collate responses as a class.</p>

Term 2 Week 3

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society Technologies are used in the design of products, and implementation of services and environments</p>	<p>Learning intentions</p> <p>To explore the purposes of recycling.</p> <p>To investigate the possible ways paper can be reused and/or recycled.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What are the advantages or disadvantages of recycled paper? • What are the advantages or disadvantages of paper made from wood? • Why did recycling begin? <p>Support notes</p> <p>Plan for students to visit another classroom or area of the school to investigate the way paper is being used and any evidence of recycling in the school. Prepare some focus questions for students to consider when conducting their visit.</p>	<p>Introduction</p> <p>Review the responses from the group discussion in the previous learning experience. Correct any responses based on misinformation.</p> <p>Ask students to consider why people started recycling materials. Select and watch the video <i>History of Recycling – When Did Recycling Begin?</i> https://www.youtube.com/watch?v=ZsqVrkjS0Qo.</p> <p>Discuss ways paper could be repurposed or reused. Invite responses before assigning students to pairs or small groups.</p> <p>Learning activities</p> <p>In pairs or small groups, students brainstorm ways paper could be reused or recycled.</p> <p>Students visit other classrooms or areas of the school to collect data on how teachers/staff members/students in the school reuse paper, at home and work, to avoid waste.</p> <p>Students add responses to their group brainstorm and share their ideas with another group.</p> <p>Conclusion</p> <p>Ask students to consider how paper could be reused in the classroom. List student responses.</p>

Term 2 Weeks 4–5

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society Technologies are used in the design of products, and implementation of services and environments</p> <p>Design thinking skills</p> <p>Project management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Investigating and defining Break down a design brief to define the purpose and requirements for a given task Investigate and select resources based on properties and functions for the given task</p> <p>Designing Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process</p>	<p>Learning intention To plan a storyboard annotating the steps for creating recycled paper.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What areas of the school have the most potential for paper recycling • What are the steps in creating recycled paper? • What materials and technologies are required to produce recycled paper? <p>Support notes Schedule a second visit to the area of the school that students are working with to ask the teachers/staff members/students what would be helpful for them to make out of their recycled paper. Note: a method/appliance for blending is required for the paper recycling process.</p> <p>Suggested assessment point The students' design brief explanation and the annotated storyboard can form part of a summative assessment.</p>	<p>Introduction Reflect on the students' results from the information gathered from across the school in the previous learning experience.</p> <ul style="list-style-type: none"> • What areas of the school have the most potential for paper recycling? • What areas of the school are already reusing paper successfully? <p>Discuss with students the process of paper recycling and the technologies involved. View videos or provide step-by-step instructions, as shown in the example in Appendix A.2.</p> <p>Learning activities Students work in pairs or small groups and select a focus area of their school that needs assistance with paper recycling.</p> <p>Students visit the area of the school that they are working with and ask the teachers/staff members/students what would be helpful for them to make out of their recycled paper.</p> <p>Students collect leftover paper from each area and create a new item that would be helpful for that part of the school. For example, a number or letter display for the Pre-primary classrooms made of leftover paper scraps, or a sign for the front office introducing visitors to the school made from shredded paper waste.</p>



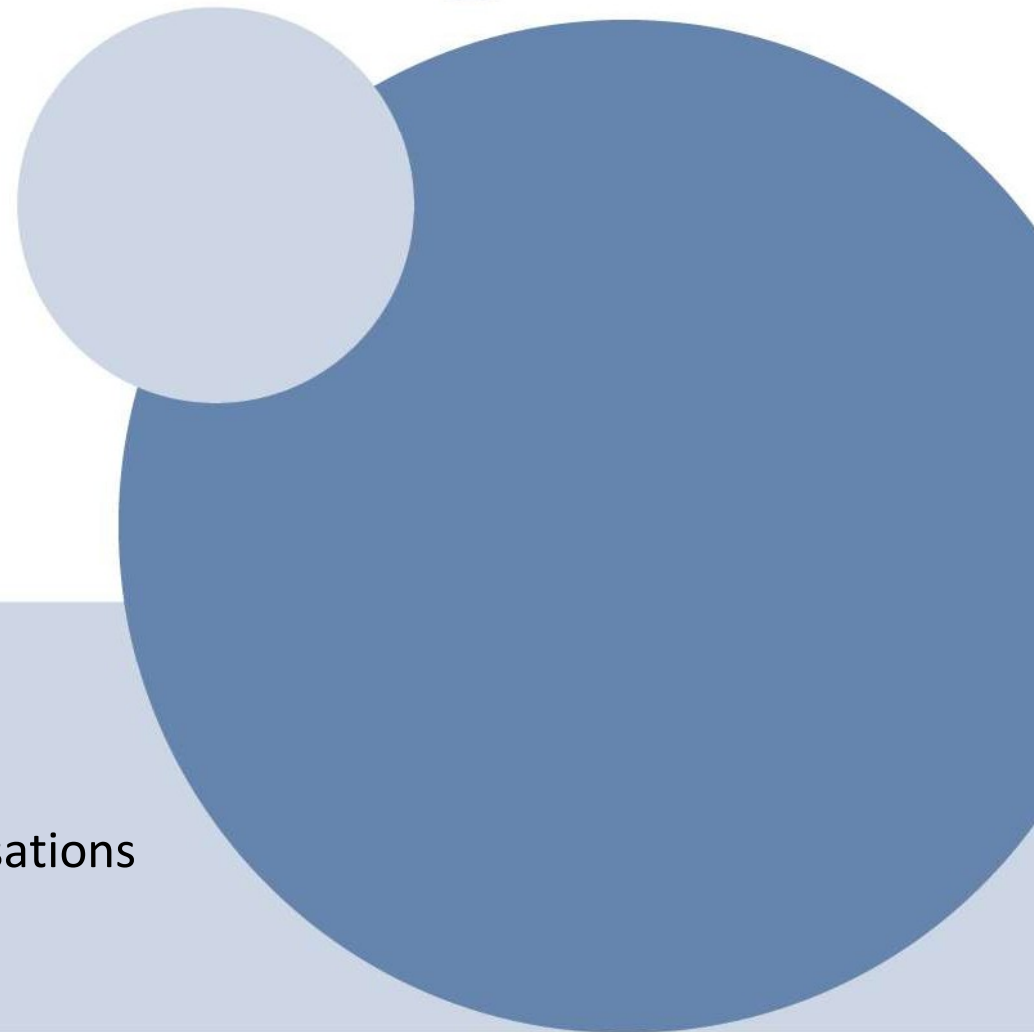
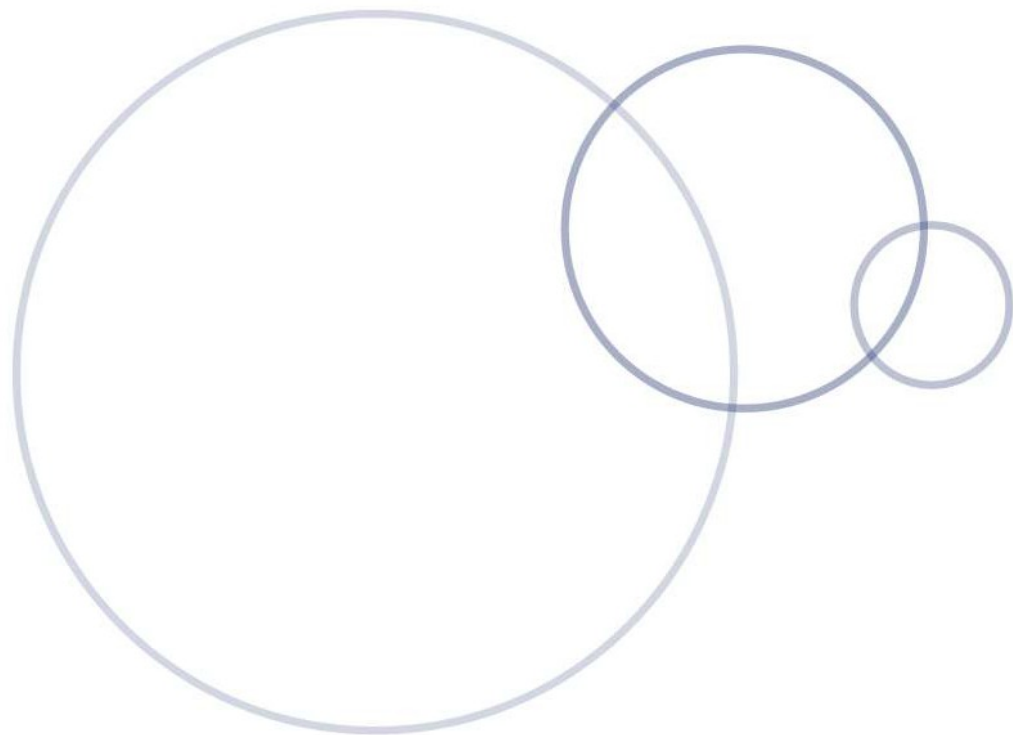
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
		<p>Students create a storyboard that outlines the design plan and process that they will use to create recycled paper. Encourage students to annotate any images, and include a list of the items required, noting where they will source each item.</p> <p>Conclusion</p> <p>If time permits in this lesson, or at another time prior to the next learning experience, complete stage 1 of the recycling process by shredding and soaking the paper overnight or over the weekend (Appendix A.2).</p>

Term 2 Weeks 6–7

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society Technologies are used in the design of products, and implementation of services and environments</p> <p>Design thinking skills</p> <p>Project management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Producing and implementing Use technologies, components and/or equipment to implement agreed protocols to produce a designed solution</p>	<p>Learning intention To use technologies in the creation of recycled paper, and various items made from recycled paper.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What technologies are required to create recycled paper? • What materials are required to make recycled paper? • What items can be made from recycled paper? <p>Suggested assessment point Formative observation of students' project management skills during the process of making recycled paper and creating items that are specific to their chosen area.</p>	<p>Introduction Encourage students to reflect on their storyboard and ensure that they have all the items required to create recycled paper.</p> <p>Discuss with students the expectations for moving around the space and using any equipment required when creating their recycled paper. Ensure students have set up appropriate drying areas and are clear on their individual roles within the groups' tasks.</p> <p>Learning activity Students check on their soaking paper (prepared at the end of, or after, the previous learning experience) and take it in turns to blend their paper depending on the determined method and the size of the batches.</p> <p>Once the paper is dry, students can begin creating the items that they had planned for their area of the school. The recycled paper may need to be made in batches over a series of lessons, and items left outside in the sun to increase drying speed.</p> <p>Conclusion Students consider their roles and ensure that their group is following their design plans.</p>

Term 2 Week 8

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Food and fibre production Food and fibre production in environments for sustainable and regenerative practices</p> <p>Technologies and society Technologies are used in the design of products, and implementation of services and environments</p> <p>Design thinking skills</p> <p>Evaluating Use given criteria to evaluate design features, with consideration of competing factors, processes and the designed solution</p>	<p>Learning intention To evaluate the success of the creation of recycled paper and determine future uses for the product.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What are the benefits/disadvantages of recycled paper compared to paper made from wood? • Why is all paper nowadays not recycled? • How might the use of recycled paper be increased in society? <p>Suggested assessment point Summative assessment opportunity with individual reflections on the collaboratively negotiated criteria, see Assessment task 2 (Appendix C).</p>	<p>Introduction Discuss with the students how they might evaluate the success of the recycled paper made in the previous learning experience. Using a whole class brainstorm decide on a minimum of three criteria for the success of their paper and subsequently created product.</p> <p>Compare the process of creating recycled paper to making paper made from wood. What are the benefits or disadvantages? Reflect on Lessons 1 and 2, with the knowledge and understanding of what it takes to create recycled paper after experiencing it.</p> <p>Encourage students to consider the wide-reaching benefits of sustainability. Point out the process of recycled paper and the product created versus the ability to create long-term use for paper items.</p> <p>Conclusion In groups, students discuss the success of their recycled paper. Are there any steps in the process they would change? If so, why or why not? Students write or record an individual reflection on their personal evaluations of the process, which can form part of the summative assessment task.</p>

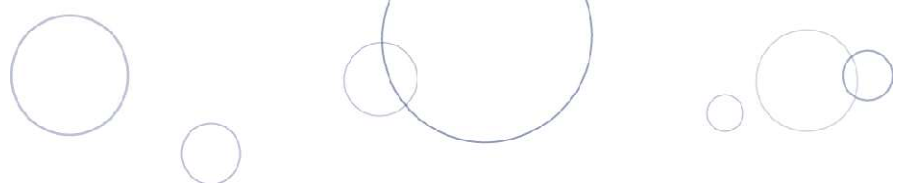


Term 3

Weeks 1–8: Materials and technologies specialisations

Term 3 Week 1

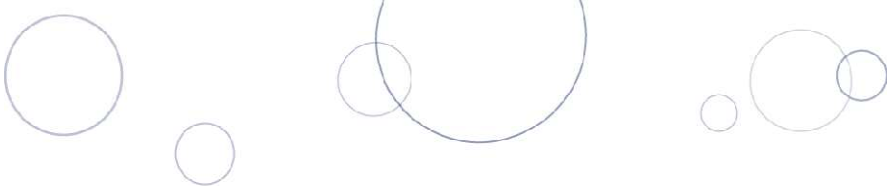
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Materials and technologies specialisations Properties for a range of materials, related components and use of given technologies to achieve a purpose</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p>	<p>Learning intention To investigate the properties of materials used to make reusable food bags.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What is the purpose and value of reusable food bags? • What are the benefits and disadvantages of reusable food bags compared to disposable, sealable food bags, such as plastic resealable sandwich bags? • What materials are used to make reusable food bags? • What are the properties of the materials used to make reusable food bags? <p>Support notes Investigate the materials used to make reusable food bags/wraps including competing considerations, such as ease of use, price and use for a range of foods or goods, within a wide temperature range.</p> <p>Students could also compare the materials used to make disposable food bags/wrap (soft plastics) with reusable food bags or wrap (beeswax, silicone, cloth etc.).</p> <p>Outline the design brief for the remainder of the term – design and make a reusable food bag – and brainstorm</p>	<p>Introduction Show students a small range of reusable food bags and/or wraps. Invite students to feel each bag or wrap and discuss the different materials used to make them.</p> <p>With students, brainstorm the purpose and value of reusable food bags. Ask students to consider why some people choose to use reusable food bags or wraps over disposable bags, such as plastic resealable sandwich bags and wraps.</p> <p>Divide students into small groups and use a cooperative learning strategy, such as a graffiti, for students to list the benefits and disadvantages of reusable food bags.</p> <p>Students undertake a gallery walk to read and discuss each group’s brainstorm.</p> <p>Learning activity In pairs or independently, students investigate the range of materials (and their properties) used to make reusable snack bags and wraps. Include materials used to waterproof wraps or bags, where applicable.</p> <p>Students add to their graffiti, based on their investigation and share with the class or small group.</p> <p>To develop this design brief, assist students to access resources from the Waste Authority WA Government – Waste Free Lunch Toolkit (Appendix A.3).</p> <ul style="list-style-type: none"> • https://www.wasteauthority.wa.gov.au/wss/program/view/WWS-Waste-Free-Lunches



Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	<p>potential materials. Students may bring their own fabric from home.</p> <p>If students bring materials from home, discuss the possibility of recycling old clothes or linen, such as jeans, shorts, towels, sheets, pillowcases or placemats.</p> <p>Possible materials needed include:</p> <ul style="list-style-type: none">• tools to close the reusable food bag – hook and loop tape, buttons or fabric glue• thick fabric or vinyl for bag• decorative elements if required – fabric paint, iron-on transfer• thread/needle, if sewing• scissors.	<p>See Appendix A.3 for other suggested links explaining how to make reusable food bags.</p> <p>Conclusion</p> <p>Provide opportunity for students to share their graffiti.</p>

Term 3 Week 2

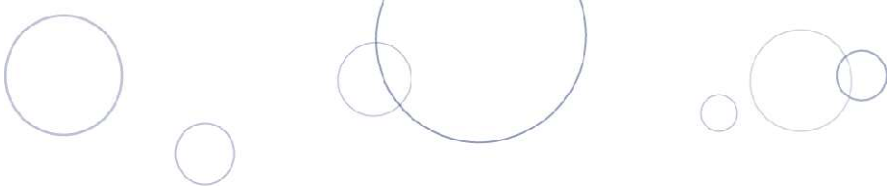
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Materials and technologies specialisations Properties for a range of materials, related components and use of given technologies to achieve a purpose</p> <p>Design thinking skills</p> <p>Project management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Investigating and defining Break down a design brief to define the purpose and requirements for a given task Investigate and select resources based on properties and functions for the given task</p> <p>Designing Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process</p>	<p>Learning intentions</p> <ul style="list-style-type: none"> To create a design for a reusable food bag, suitable for storing dry food items. To justify the suitability of the design choices. To create an annotated and sequenced set of instructions for creating the design. <p>Focus questions</p> <ul style="list-style-type: none"> What might you consider when designing a reusable food bag? What materials can be reused time and time again? What justifications can you give to your choice of design and material? <p>Support notes Students define the problem, in terms of the product proposal and design brief, and specifically relate it to the characteristics and properties of materials and suitability of the materials for the design.</p> <p>Students identify available resources, such as how-to websites or videos, materials selected for making the bag and the suitability and ease of use of the materials.</p> <p>It is at the teacher’s discretion to decide if students will sew the bags together or create a no-sew reusable food bag using tools, such as fabric glue and hook and loop tape.</p>	<p>Introduction Explain to students they will be designing and making a reusable food bag that can hold dry food, i.e. no waterproofing required. The bag of must be at least sandwich size. Students may need to view one or both tutorials in Appendix A.3. Model annotating a sketch or diagram.</p> <p>Learning activities Students define the problem and sketch two designs of a reusable food bag. Students select one of the designs, justifying their choice, and do a final sketch that includes annotations, ways of holding the reusable food bag together and the size of the reusable food bag. They prepare a set of sequenced steps to follow in making the reusable food bag.</p> <p>Conclusion Students give each other feedback on the clarity of their steps.</p>



Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	<p>A design task booklet for the design process can be found in Appendix A.3. Teachers are best placed to determine suitability of the booklet and may choose to make changes to suit the context of the students.</p> <p>Suggested assessment point Formative assessment based on the annotations and design process students undertake when sketching their reusable food bag.</p>	

Term 3 Weeks 3–4

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Materials and technologies specialisations Properties for a range of materials, related components and use of given technologies to achieve a purpose</p> <p>Design thinking skills</p> <p>Project management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Investigating and defining Break down a design brief to define the purpose and requirements for a given task Investigate and select resources based on properties and functions for the given task</p> <p>Designing Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process</p> <p>Producing and implementing Use technologies, components and/or equipment to implement agreed protocols to produce a designed solution</p>	<p>Learning intention To construct a reusable food bag based on the annotated design.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What is the purpose of each material used in the construction of your reusable food bag? • What criteria will help to evaluate the success of your product? • What improvements could you make to the design for a more successful construction? <p>Support notes Possible criteria may include whether it would hold a sandwich comfortably and stay closed to ensure freshness. It is at the teacher’s discretion whether students sew the bags together or create a no-sew reusable food bag using tools, such as fabric glue and/or hook and loop tape. Discuss with students the need for cooperation in sharing materials and equipment to complete the task and adhering to safety precautions. Evaluate the product using the negotiated criteria, management of sequenced instructions, use of resources and implementation of any safety processes.</p>	<p>Introduction Review the task from Week 2, including tutorial if required (Appendix A.3).</p> <p>Learning activities Students list the materials needed for the task and the purpose of each material. As a class, discuss the design criteria and develop three criteria to use to evaluate the reusable food bag. Students independently construct the reusable food bag using the materials provided or brought from home.</p> <p>Conclusion Students evaluate their reusable food bag based on the agreed criteria and note any improvements they would make to the design. Use a cooperative learning strategy to share any improvements they would make as part of the evaluation of the product.</p>



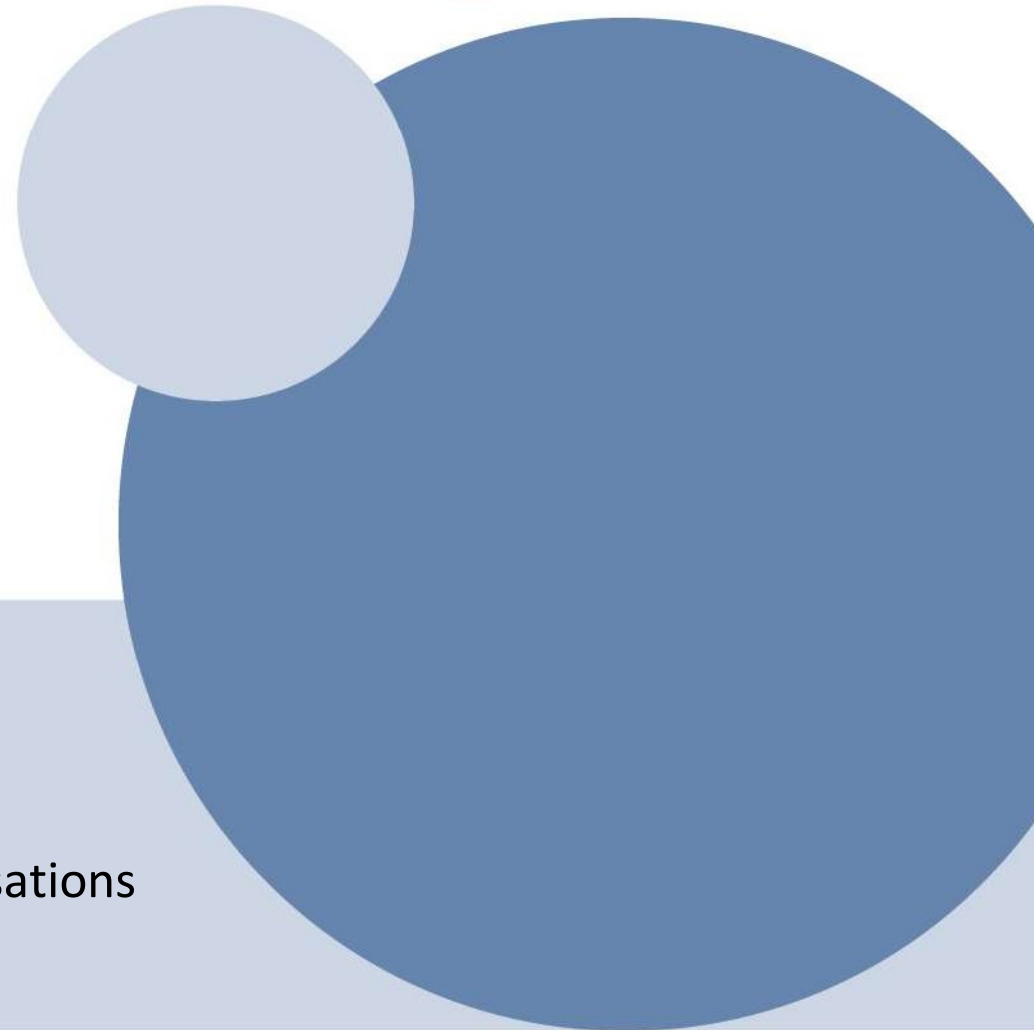
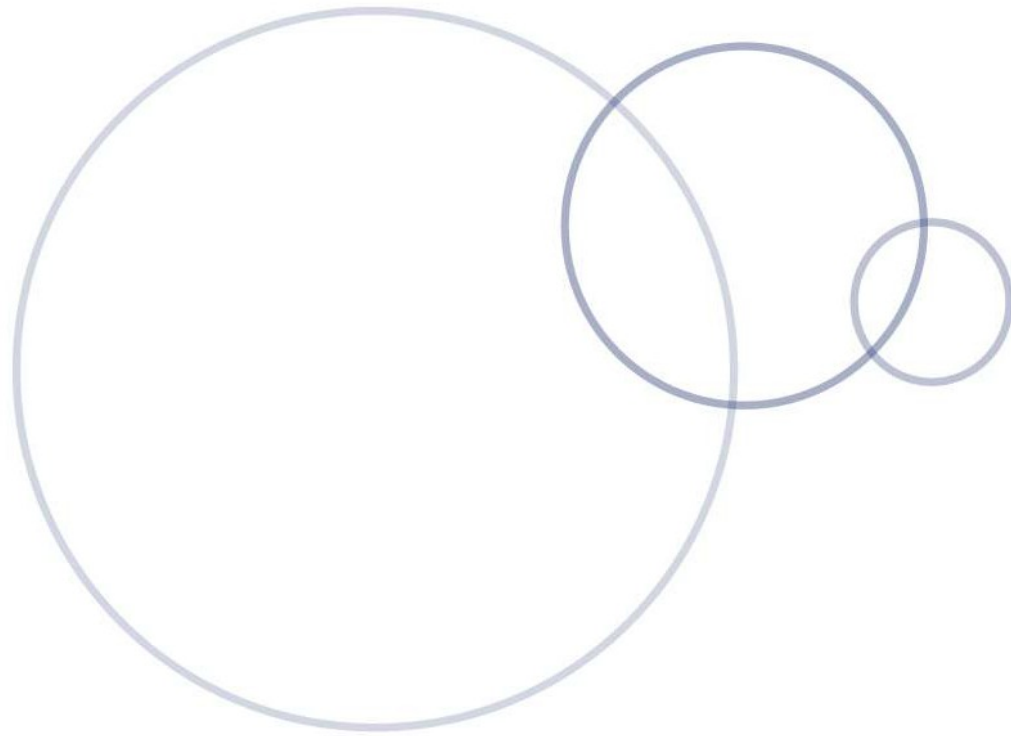
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
Evaluating Use given criteria to evaluate design features, with consideration of competing factors, processes and the designed solution	Suggested assessment point Reflect on the students' contributions to their design task booklet and make note of their ability to reflect on and evaluate improvements.	

Term 3 Weeks 5–8

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Materials and technologies specialisations Properties for a range of materials, related components and use of given technologies to achieve a purpose</p> <p>Design thinking skills</p> <p>Project Management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Investigating and defining Break down a design brief to define the purpose and requirements for a given task Investigate and select resources based on properties and functions for the given task</p> <p>Designing Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process</p> <p>Producing and implementing Use technologies, components and/or equipment to implement agreed protocols to produce a designed solution</p>	<p>Learning intention To design and construct a mini solar-powered pizza oven.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What are the characteristics and properties of materials that conduct solar thermal energy? • What might be some of the possible uses of a solar-powered oven? • What is necessary to include when designing and building a solar-powered oven? • What criteria are necessary to determine the success of the design and construction of the oven? <p>Summative assessment task In this assessment task, students will investigate the characteristics and properties best suited for conducting solar thermal energy to cook a pizza. Students will explore materials to make a solar oven, then design and make a mini solar oven to cook a pizza.</p> <p>Possible resources include:</p> <ul style="list-style-type: none"> • small to medium boxes • aluminium foil/plastic wrap • acrylic sheet • black paint or black cardboard • glue/tape. 	<p>Introduction 1 These learning experiences are based on Assessment task 2 (Appendix C). Discuss with students how materials can be used to produce cooking items, such as solar energy to cook food. Talk about the sustainability of using alternative sources of energy for cooking food.</p> <p>Explain to students that they will design and make a mini solar oven to bake a pizza using suitable materials to conduct solar thermal energy. Using the design task booklet (Appendix C), students describe this task.</p> <p>See Appendix A.3 for a video to watch as inspiration and a website to access for additional instructional materials.</p> <p>Learning activity 1 Students use texts and websites to research the characteristics and properties of materials to conduct solar thermal energy. They record located information in the design booklet and categorise the different types of materials that can conduct solar energy. Students investigate current uses of solar ovens.</p> <p>Introduction 2 Discuss with students the materials and equipment available to make a mini solar oven.</p> <p>Learning activity 2 Students brainstorm possible design solutions and sketch two possible design solutions. They determine the size of the mini solar oven and what materials would be required.</p>



Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Evaluating Use given criteria to evaluate design features, with consideration of competing factors, processes and the designed solution</p>		<p>They select one of the sketches, justify their decision and develop an annotated design of their product, that includes the size of each part and how the parts are joined.</p> <p>Introduction 3 Develop with students the different design criteria to evaluate their solar oven. Within a small group, students collaboratively develop three to five criteria to evaluate their product. Discuss with students the importance of justifying how and why the criteria will determine the success of the design.</p> <p>Students list the materials they will use to build their mini solar oven, and explain the purpose of each, including the materials used for fastening.</p> <p>Learning activity 3 Discuss with students the need for cooperation in sharing materials and equipment to complete the task and to adhere to safety precautions.</p> <p>Supervise and observe the safe use of equipment and tools and allow time for students to safely construct their solar oven. Students take photos of their completed product to include in their design task booklet.</p> <p>Conclusion Students test their finished mini solar oven by using it to cook a simple pizza or cheese toast. They collaborate to evaluate their solar oven against the agreed design criteria and complete their design task booklet.</p>



Term 4

Weeks 1–8: Materials and technologies specialisations

Term 4 Weeks 1–2

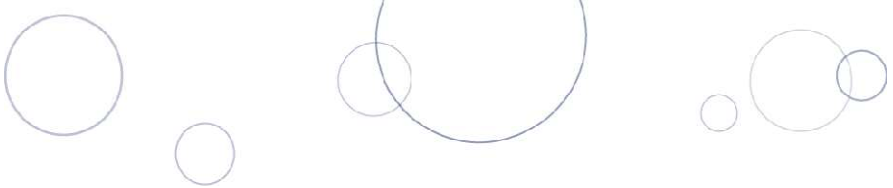
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Materials and technologies specialisations Properties for a range of materials, related components and use of given technologies to achieve a purpose</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p>	<p>Learning intention To explore the materials and construction techniques used in different houses around the world.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What materials are used in cold climates/hot climates to construct houses or temporary shelters? • What are the properties of materials used in each construction, and what makes those materials suitable to the environments? • What different shapes are used in constructing houses? What impact do those shapes have? • Why are certain materials used in some houses and not others? <p>Support notes This learning experience introduces students to the varying materials and shapes used in the construction of houses and/or shelters in different climates, and the suitability of the materials. When showing students images of houses, ensure a range of houses is shown from varying climates and environments with a variety of materials used, and highlight the reasons these materials or shapes in construction have been used. For instance, igloos, adobe mud huts (South and Central America) or tents, and houses/structures built from straw, wood, stone, bricks or on stilts.</p>	<p>Introduction 1 Introduce houses around the world by reading a short picture book places people call home or watching a video showing different houses. See Appendix A.4 for a list of suggested books and videos.</p> <p>Ask students what they know about the materials used in building houses. Students complete a KWL chart on houses and construction materials. If required, prompt students to include knowledge about sustainability and why a wide range of materials is used.</p> <p>With students, brainstorm the different types of houses and shelters found across the world. Include temporary shelters in the brainstorm. Refer back to the short picture book or video, if required.</p> <p>Display a small range of images of different types of shelters or houses. With students, identify and list the materials used in the construction of each house or shelter.</p> <p>Briefly explain that people in different parts of the world and different climates have access to different materials. When constructing a home, they consider how best to use the materials available to construct a house or shelter suitable for their climate and environment.</p> <p>Divide students into small groups and allocate each group a different house or structure that uses different materials in the construction; for instance, mud/straw, brick/tiles, stilt houses or wood houses.</p>



Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	<p>These learning experiences also provide an opportunity to investigate traditional Aboriginal and/or Torres Strait Islander people’s housing, either across Australia or local to the students’ context.</p> <p>The focus in Weeks 1 to 3 will be to identify the materials as well as shapes used in houses, why the materials are chosen and how they support the climate and environment. Houses built with sustainable design features (eco houses) will be looked at in Week 3.</p> <p>Suggested assessment point Use a Know-Want to know-Learned (KWL) chart as formative assessment.</p>	<p>Alternatively, allocate a climate and/or region or country for students to investigate the houses and main materials used.</p> <p>Learning activity 1 In groups, students investigate the following:</p> <ul style="list-style-type: none"> • any special design features • materials used in the construction • the benefits and disadvantages of each material • the reason or purpose behind the material choice. <p>Students develop a front and side view annotated sketch of the house that includes the information they have found.</p> <p>They present their diagrams and information to the class or within a small group. Students add any additional materials found in their investigation to the list of materials made earlier in the learning experience.</p> <p>Introduction 2 Refer back to the materials used in the construction of houses across the world. Use a table to classify these, providing one material under each heading as a model (Appendix A.5). A review of the definitions of each of the headings may be required.</p> <p>Conclusion Individually, students create a table to classify all materials found.</p>

Term 4 Week 3

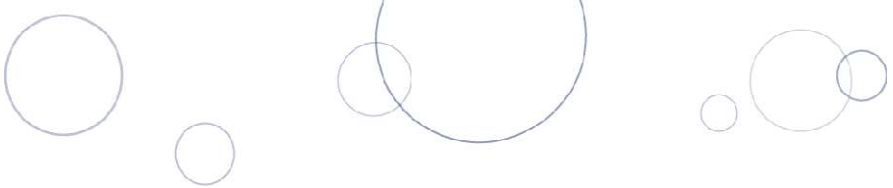
Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Materials and technologies specialisations Properties for a range of materials, related components and use of given technologies to achieve a purpose</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p>	<p>Learning intention To understand the properties and building considerations of sustainable houses</p> <p>Focus questions</p> <ul style="list-style-type: none"> • What are the main properties of an eco-house or energy efficient house? • What are the competing considerations (e.g. building orientation) in designing and building an eco-house? <p>Support notes</p> <p>Australia has a wide range of climates and environmental conditions. Adapting house construction and using sun and/or wind energy ensure houses are energy efficient and sustainable.</p> <p>Design features and energy-efficient structures include shade sails, insulation, double-glazed windows, skylights, solar panels, wind turbines, rainwater collection, choice of building materials to keep houses or shelter warm in cold climates or cool in hot climates; varying building orientation to make the most of solar energy and/or ventilation; and the use of skylights.</p> <p>Passive design is a house design that considers local climate and environmental conditions to ensure a comfortable year-round temperature within the home. This reduces the need to use energy to maintain the temperature within the home.</p>	<p>Introduction</p> <p>Check students' understanding of sustainability by asking them to discuss what the term sustainable means.</p> <p>After a brief discussion, ask students what they believe is meant by a sustainable house. List the responses given and highlight those that focus on considerations in the design and construction, such as choice of building materials.</p> <p>Divide students into small groups or pairs to research two of the sustainable or energy efficient design features. Allocate the design feature each pair or small group will investigate.</p> <p>Students report on:</p> <ul style="list-style-type: none"> • name of the design feature or building materials and a description of it/them • how the design feature or choice of materials supports sustainability; for example, through increasing energy efficiency • benefits and disadvantages of the feature and/or material. <p>Learning activity</p> <p>Students investigate two design features or sustainable building materials.</p>



Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	<p>See Appendix A.4 for a suggested website that provides information on passive design features as well as case studies of passively designed houses in Australia. This is an Australian Government website that can be used as a starting point for students' research.</p> <p>Suggested assessment point Use the KWL chart as a summative assessment.</p>	<p>Use a cooperative learning strategy, such as a placemat, for students to share information with at least two other students.</p> <p>Conclusion Complete the KWL chart from Week 1.</p>

Term 4 Weeks 4–5

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Materials and technologies specialisations Properties for a range of materials, related components and use of given technologies to achieve a purpose</p> <p>Technologies and society People in design and technologies occupations consider competing factors in the design of products, services and/or environments</p> <p>Design thinking skills</p> <p>Project management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Investigating and defining Break down a design brief to define the purpose and requirements for a given task Investigate and select resources based on properties and functions for the given task</p> <p>Designing Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process</p>	<p>Learning intention To design a model of a new house-build in the local area, considering sustainability, energy efficiency and the local environment within the design choices.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • Which building materials would benefit energy efficiency and/or would be most readily available within this area? • What are the passive design features you will use in your home? <p>Support notes Students define the problem in terms of the product proposal and design brief, and specifically relate it to the characteristics, properties and sustainability of materials. A generic design task booklet for the task can be found in Appendix A.6. Students identify available resources, such as equipment or materials for each part. Students may use free 3D modelling software to design a house or sketch the design by hand. Further guidance in building a 3D model of a house is found in Weeks 6–8. If required, students can begin bringing in materials from home.</p>	<p>Introduction Review learning from Weeks 1–3, referring to any charts and lists still displayed in the classroom. Provide students with the following design task: a new housing project will commence in this area within the next 12 months. Design and build a 3D model of a family house that uses at least two features or materials to support sustainability or energy efficiency. If suitable, choose a design task for an upcoming building that may take place in the school; for example, a chicken coop, a greenhouse to grow fruit and vegetables, or redesigning portable buildings into permanent classrooms. Discuss the environmental conditions and local climate in the students’ context. Use the focus questions to guide discussion. Model sketching a front and side view of a house with some brief annotations. Discuss which recyclable materials could be used to make a model.</p> <p>Learning activity Students define the problem and sketch two designs of a possible home that show the front and side view of each possibility. They select one of the designs, justifying their choice, do a final sketch with a front and side view of the house with annotations, such as building materials and passive-design</p>



Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
	<p>Design criteria could include use of two sustainable or energy-efficient features, and materials that are readily available within their context.</p>	<p>features. Students provide justification for each feature or material.</p> <p>Students list materials needed to build the 3D model and the purpose of each material required.</p> <p>Conclusion Collaboratively discuss the design criteria and develop three to five criteria to evaluate their design.</p>

Term 4 Weeks 6–8

Western Australian Curriculum content	Teaching and learning intentions	Learning experiences
<p>Contexts</p> <p>Materials and technologies specialisations Properties for a range of materials, related components and use of given technologies to achieve a purpose</p> <p>Design thinking skills</p> <p>Project management Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions</p> <p>Designing Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process</p> <p>Producing and implementing Use technologies, components and/or equipment to implement agreed protocols to produce a designed solution</p>	<p>Learning intentions</p> <p>To build a 3D model of the previously designed house, including specific design features and appropriate building materials.</p> <p>To reflect on the success of the house model, considering what changed or did not change from the original design, and why.</p> <p>Focus questions</p> <ul style="list-style-type: none"> • Which building materials would be beneficial and/or be most readily available within this area? • What are the passive design features you will use in your home? <p>Support notes Evaluate the product using the negotiated criteria, management of sequenced instructions, use of resources and implementation of any safety processes.</p> <p>An internet search of ‘how to make a model home out of cardboard’ may provide further information about constructing a 3D model of a house, and the materials required.</p> <p>Suggested assessment point Use the design alongside the completed construction, and the students’ personal evaluation and reflection on the process, to form a summative assessment for this task.</p>	<p>Introduction 1 Review the design task and the negotiated criteria from the previous learning experience.</p> <p>Discuss with students the need for cooperation in sharing materials and equipment.</p> <p>Discuss safety precautions when using equipment.</p> <p>Learning activity 1 Students independently construct a 3D model of the house using sustainable or energy-efficient materials.</p> <p>Students evaluate the house design and model using the negotiated criteria. They note any improvements they would make and provide the reasons why it would be a suitable solution.</p> <p>Introduction 2 Discuss the importance of following design ideas. Ask students to share their experiences (pros and cons) of following designs during the house building process.</p> <p>Conclusion Use a cooperative learning strategy to reflect on the task, the self-evaluations and any adjustments students would make.</p> <p>Optional extension: design the internal rooms and layout.</p>



Appendix A

Resources

Appendix A.1: Resources – Term 1

Suggested teacher resources

Week	Resource	Link/information
1	Sustainable Schools NSW resources for creating school and community food gardens	Sustainable schools NSW. <i>Food Gardens</i> . https://sustainableschoolsnsw.org.au/curriculum/teaching-resources/food-gardens/
	Australian Organic Schools Gardening Resources	Australian Organic Schools. <i>For Gardeners</i> . https://organicschools.au/gardeners/
	ABC Gardening Australia video about community gardens	Gardening Australia. <i>Growing veggies and friendships in a productive community garden</i> https://www.youtube.com/watch?v=DTsGaaTbJ6o
2	Gardening Australia episode about a school in the Swan Valley that created a community garden	ABC. <i>Gardening Australia – Creating a school garden part 1</i> . https://www.abc.net.au/gardening/how-to/creating-a-school-garden/9427752
	ABC Kids episode about community gardens	ABC. <i>ABC Kids: Community Garden</i> . https://www.abc.net.au/abckids/early-education/family-community-and-culture/play-school-where-i-belong-community-garden/13275036
	City of Cockburn community garden grant	Roberts, J. <i>Childcare centre uses popular children’s book to create community garden</i> . https://thesector.com.au/2019/01/31/childcare-centre-uses-popular-childrens-book-to-create-community-garden/
	Edible school garden weather sustainability guide	Government of Western Australia. <i>Edible School Garden – Planning and Maintenance Guide</i> . https://www.wasteauthority.wa.gov.au/images/resources/wss/Files/2019/10/Edible_Garden_Planting_and_Maintenance_Guide.pdf

Week	Resource	Link/information
3	Food Waste AU resource	Food Bank. <i>Food waste in Australia</i> https://www.foodbank.org.au/food-waste-facts-in-australia/?state=au
	Community Gardens Australia Blog	Dean, J. <i>Zero waste initiative for community gardens.</i> Zero Waste Initiative For Community Gardens - Community Gardens Australia
	ABC's Gardening Australia episode on composting	Gardening Australia. <i>How to make great compost.</i> https://www.youtube.com/watch?v=IGynzcwXZk4
	CSIRO Indigenous Seasons Calendars	CSIRO. <i>Indigenous Seasonal Calendars.</i> https://www.csiro.au/en/research/indigenous-science/indigenous-knowledge/calendars
	ABC's Gardening Australia episode on the Noongar seasons	ABC. <i>Noongar 6 seasons.</i> https://www.abc.net.au/gardening/how-to/noongar-6-seasons/13841376
4	Designing a dream school community garden	Sustainable Gardening Australia. <i>A school's sustainable gardening adventure.</i> https://www.sgaonline.org.au/a-schools-sustainable-gardening-adventure/
	Online software for planning a garden	Veg Plotter. <i>Get kids growing!</i> https://vegplotter.com/schools
	Lesson plan from Junior Landcare on creating a food garden	Junior Landcare. <i>Creating a food garden – Vision.</i> https://juniorlandcare.org.au/learning_activity/creating-a-food-garden-vision/
5	A detailed step by step guide to setting up and running a school garden	Food and Agriculture Organisation of the United Nations. <i>Setting up and running a school garden.</i> https://www.fao.org/4/a0218e/A0218E00.htm#TOC

Appendix A.2: Resources – Term 2

Week	Resource	Link/information
1–2	How Paper is Made	PaperOne. How paper is made. https://www.youtube.com/watch?v=OXQDsSctP1M This video also highlights the importance of sustainability – one of the competing considerations for design and technology occupations within the paper industry.
	The Paper Recycling Process	Domtar. The paper recycling process. https://www.youtube.com/watch?v=jAqVxsEgWIM
	Australian Paper Recycling	Officeworks. Australian paper recycling https://www.youtube.com/watch?v=91SuMxjhpDU
3	History of Recycling – When Did Recycling Begin?	Waster – Waster Pty Ltd – Recycling Facts & Info. History of recycling – When did recycling begin? https://www.youtube.com/watch?v=ZsqVrkjS0Qo
4–5	Steps to create recycled paper	Rosenthal, C. <i>How to make paper – a recycling craft for kids.</i> https://www.steampoweredfamily.com/how-to-make-paper/

Appendix A.3: Resources – Term 3

Week	Resource	Link/information
1–4	No sew reusable snack bags	Made With Happy. <i>No sew reusable snack bags</i> . https://www.madewithhappy.com/no-sew-reusable-snack-bags/ How to make a no-sew reusable snack bag, including images of the final product.
	How to Make Reusable Snack Bags (Tutorial)	Wholefully. <i>How to make reusable snack bags (Tutorial)</i> . https://wholefully.com/tutorial-reusable-snack-bags/ Step by step tutorial of making a reusable snack bag.
	Waste Authority WA Government Waste Free Lunch Toolkit	Government of Western Australia. <i>Waste Free Lunch Toolkit</i> . https://www.wasteauthority.wa.gov.au/wss/program/view/WWS-Waste-Free-Lunches
5–8	The Craft Train – DIY Solar Oven from a repurposed cardboard box	Kate Grono. <i>DIY solar oven from a repurposed cardboard box</i> . https://www.thecrafttrain.com/diy-solar-oven/
	Solar Oven Pizza box Experiment – Solar oven project/Solar Cooker – Kids Fun Science	Kids Fun Science. Solar Oven Pizza Box Experiment: DIY Solar Oven. https://www.youtube.com/watch?v=kBmy-Aelzp0

Appendix A.4: Resources – Term 4

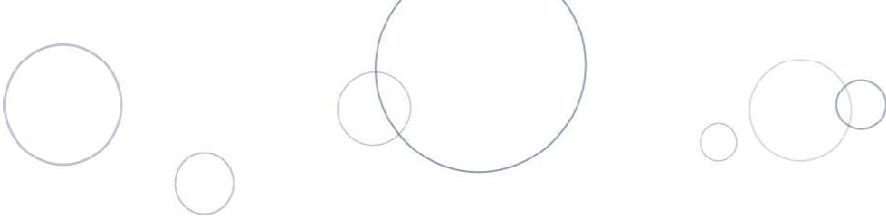
Week	Resource	Link/information
1–2	Different Types of Houses	Periwinkle. <i>Different types of houses Educational video for kids Periwinkle.</i> https://www.youtube.com/watch?v=4yRye0g2OHA
	A picture book that shows 22 houses from places, such as Turkey, Samoa and Norway	Dorros, A. <i>This Is My House</i> . Scholastic.
	A picture book of houses from across the world that looks at why each house was constructed the way it was	Laroche, G. <i>If you lived here: Houses of the world</i> . Boston: Houghton Mifflin.
	Photos of houses around the world and illustrations of the interior of each house	Komatsu, Y., & Nishiyama, A. <i>Wonderful houses around the world</i> . Bolinas: Shelter.
	Online gallery of different house types	The School Run. <i>Houses and homes</i> . https://www.theschoolrun.com/homework-help/houses-and-homes
	Houses around the world	Kidcyber. <i>Houses around the world</i> . https://www.kidcyber.com.au/houses-around-the-world Houses/shelters in Asia, Africa, the Arctic and Turkey. The website identifies why the materials were selected, including use of local and readily available materials.
3	14 Different Types of Houses Found in Countries Around the World	My Modern Met. <i>14 Different types of houses found in countries around the world</i> . https://mymodernmet.com/different-types-of-houses-around-the-world/ Images and descriptions of houses found across the world, including cave houses and the underground houses in Coober Pedy, South Australia.
	Passive Design	Your Home. <i>Passive design</i> . https://www.yourhome.gov.au/passive-design Information and case studies on passive-design features and houses around Australia.



Appendix A.5: Materials used in house construction – Term 4 Weeks 1–2

Classify materials used in building houses under each heading.

Natural	Manufactured	Recyclable	Renewable	Non-renewable

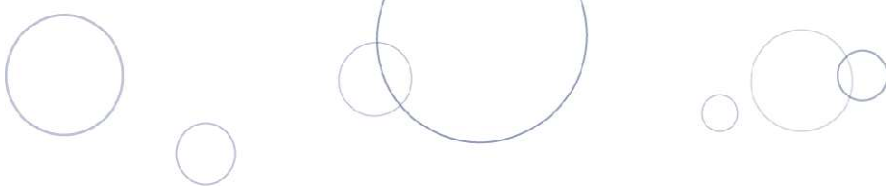


Appendix A.6: Design task booklet – Term 4 Weeks 4–5

What is the problem you have been asked to create a solution for?

Investigate the current uses of the product. Why is it used?

Investigate the characteristics and properties of materials suitable for making the product. What did you find out?



Investigate possible designs for the product. Sketch two choices you are considering. Write a short description next to each sketch.

Collaboratively negotiate at least three design criteria.

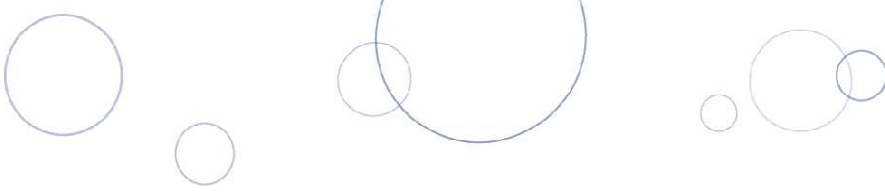


Refer to your two sketches and decide which you will build. Explain your decision.

Blank space for explaining the decision between the two sketches.

Design your product to meet the set criteria. Include notes and labels to support your design and include technical names where possible.

Blank space for designing the product, including notes and labels.



Make a list of the materials you will need.

Will you need to bring any materials from home?

You will be required to join different materials together. Draw and label the types of fastenings/joins you might use.

What safety rules did you apply when working with the tools and equipment? Why do you think it is important to follow these safety rules?

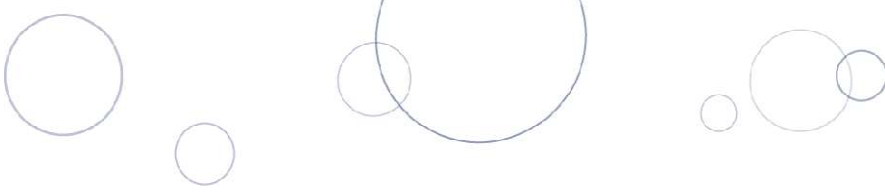


Include a photo of your finished product.

A large, empty rectangular box with a thin black border, intended for a student to upload a photograph of their finished product.

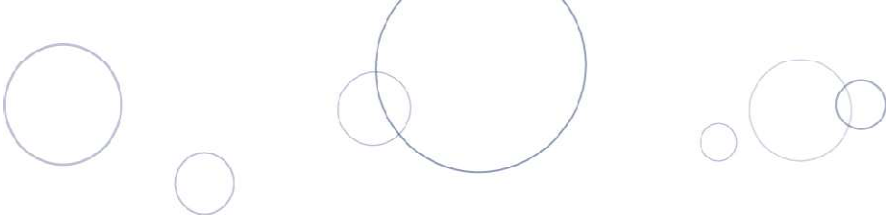
Evaluate your product against the design criteria.

A large, empty rectangular box with a thin black border, intended for a student to write their evaluation of the product against design criteria.



Write a sequence of steps that someone could use, together with the design you drew, to reproduce your product.

A large, empty rectangular box intended for writing a sequence of steps to reproduce the product.



What was the most difficult part of this task? Why?

What improvements would you make to your design and why?



Appendix B

Assessment task 1
Community garden



Task details

Title	Community garden
Description	To design in detail a section of a community garden or composting area appropriate to the school context
Type of assessment	Summative
Purpose of assessment	To design, create and reflect on the success of an element of a community garden appropriate to your school context
Ways of assessing	Written work and garden construction
Evidence to be collected	Design plans, and evaluation of the completed task
Suggested time	Four one-hour lessons
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

Contexts

Food and fibre production

- Food and fibre production in environments for sustainable and regenerative practices

Technologies and society

- People in design and technologies occupations consider competing factors in the design of products, services and/or environments

Design thinking skills

Project management

- Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions

Investigating and defining

- Break down a design brief to define the purpose and requirements for a given task
- Investigate and select resources based on properties and functions for the given task

Designing

- Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process

Producing and Implementing

- Use technologies, components and/or equipment to implement agreed protocols to produce a designed solution



Evaluating

- Use given criteria to evaluate design features, with consideration of competing factors, processes and the designed solution

Task preparation

Prior learning

Students have previously engaged in research tasks and design processes.

Students have engaged in learning about the impact that community gardens have on sustainable practices and the way they can be designed to positively affect food waste.

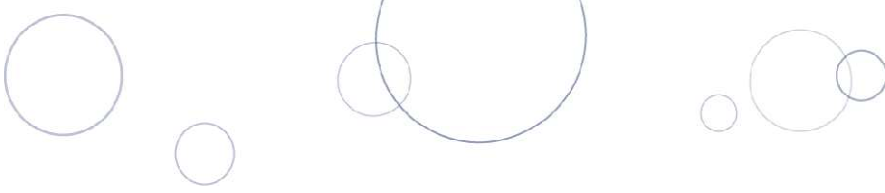
Resources

- Designing and planning document
- Materials for creation of garden item
- Reflection document (evaluation)



Instructions for teacher

1. Explain to students they have been tasked with designing and creating a section of a community garden for the school.
2. Students will work individually, in pairs or small groups to plan and create different elements of the community garden.
3. Students will develop an annotated diagram, a sequence of steps and a description of what is needed to complete the task.
4. Students will negotiate individual roles within the task, develop timelines and determine required resources.
5. Students will build their allocated community garden area.
6. Students will reflect on the areas created and complete an evaluation of the task based on determined criteria.



Community garden design and planning document

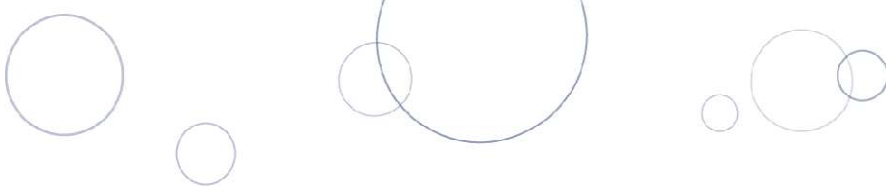
Describe what section of a community garden you are designing.

Explain why you chose this section, and how it is specific to your school context.



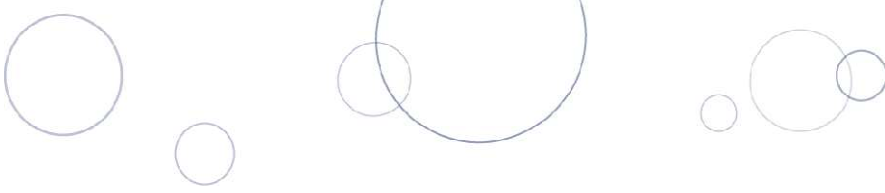
Sketch the features of your community garden design, including labels and annotations explaining the various parts.

A large, empty rectangular box with a thin black border, intended for a student to sketch their community garden design. The box occupies most of the page below the instruction.



List the materials and technologies required to complete your tasks, noting who is responsible for each item.

Material/Technology required	Person responsible



Reflection document – evaluating your success

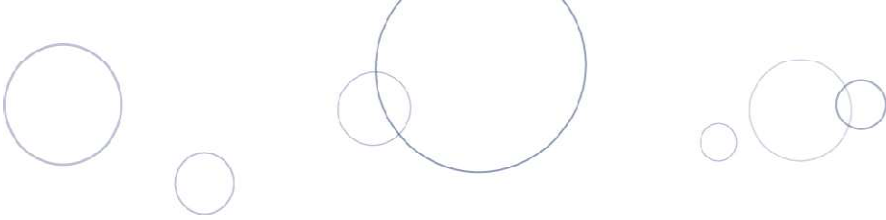
List the three criteria that you are using to evaluate your community garden project.

1. _____

2. _____

3. _____

List any additional criteria you would like to use that are specific to your group's task?



Considering these criteria, write a statement reflecting on your successes/challenges within the task.

What changes might you make, should you be given the opportunity to complete this task again?

Marking key

Description	Marks
Investigating and defining	
Provides a description of the chosen task	
Describes in detail, what section of a community garden was chosen and gives multiple reasons why, relating these to the school context	5–6
Describes in some detail, what section of a community garden was chosen and gives a reason why	3–4
States what section of a community garden was chosen	1–2
Subtotal	/6
Design process: Designing	
Designs a section of a community garden with sketches, annotations and materials	
Draws clear and accurate images with highly detailed annotations explaining the equipment and technology to be used in the community garden design	3
Draws clear images with annotations and lists materials needed to complete the design	2
Draws basic images with some mention of materials needed	1
Subtotal	/3
Food and fibre production	
Sustainability choices suitable to the community garden task	
Justifies in detail, with reference to the local community, food planting choice and weather considerations, why the design was chosen	5–6
Justifies in some detail, with some reference to the local community or food planting choice or weather conditions, why the design was chosen	3–4
Gives a basic justification with no or minimal reference to the local community, food planting choice or weather considerations	1–2
Subtotal	/6
Evaluating	
Reflects on the collaboratively developed criteria on the success of the design process and build	
Gives well thought out reasoning for their opinion of the tasks' success, including logical improvements.	3
Gives a good reason for their opinion of the tasks' success, with a simple suggestion for improvement	2
Gives a basic reason for their opinion of the tasks' success, with no improvements.	1
Subtotal	/3
Total	/18



Appendix C

Assessment task 2

Pizza in the sun



Task details

Title	Pizza in the sun
Description	Students investigate the characteristics and properties best suited for conducting solar thermal energy to cook a pizza. Students explore materials to make a solar oven, then design and make a mini solar oven to cook pizza.
Type of assessment	Summative
Purpose of assessment	To demonstrate students' understanding of the process of designing and producing and the selection of appropriate materials for their design
Ways of assessing	Written work, including their investigation into materials used for solar ovens, design task booklet, photos of solar ovens or the practical work sample
Suggested time	Four one-hour lessons
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

Contexts

Materials and technologies specialisations

- Properties for a range of materials, related components and use of given technologies to achieve a purpose

Design thinking skills

Project management

- Use agreed protocols and management roles to communicate decisions, plan and manage time, to develop designed solutions

Investigating and defining

- Break down a design brief to define the purpose and requirements for a given task
- Investigate and select resources based on properties and functions for the given task

Designing

- Design solutions considering competing factors, with annotated diagrams, storyboards and/or a sequence of steps, using technical terms and an iterative process

Producing and implementing

- Use technologies, components and/or equipment to implement agreed protocols to produce a designed solution



Evaluating

- Use given criteria to evaluate design features, with consideration of competing factors, processes and the designed solution

Task preparation

Prior learning

Students have previously engaged in research tasks and design processes.

Students may draw on learning about light reflection, refraction and absorption in the Physical sciences context from Year 5 Science.

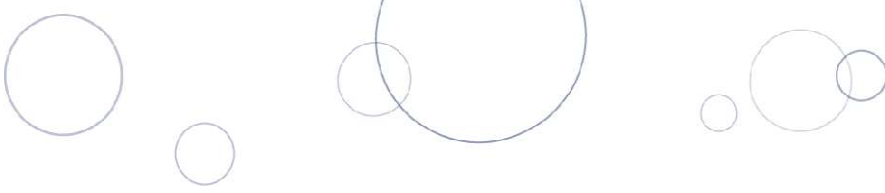
Resources

- Design task booklet
- Variety of materials suitable for constructing the mini solar oven, such as boxes, aluminium foil, black paper, black fabric or paint, plastic wrap or acrylic sheet
- Recyclable materials from home, if required
- Variety of fasteners, such as tape or glue
- Variety of tools for cutting materials
- Ingredients for a simple pizza or cheese toast
- Suggested websites with information about how to make a solar oven from a cardboard box:
 - The Craft Train – DIY Solar Oven from a repurposed cardboard box
<https://www.thecrafttrain.com/diy-solar-oven/>
 - Solar Oven Pizza box Experiment - Solar oven project /Solar Cooker – Kids Fun Science
<https://www.youtube.com/watch?v=kBmy-Aelzp0>



Instructions for teacher

1. Explain to students they will design and make a mini solar oven to bake a pizza, using suitable materials to conduct solar thermal energy. Using their design task booklet, students identify the problem they have been given.
2. Students will investigate the characteristics and properties of materials used to conduct solar thermal energy. Students collaboratively investigate and categorise the different types of materials that can conduct solar energy. Students can use simple descriptions, such as dark or light, shiny or dull.
3. Students investigate current uses of solar ovens.
4. Discuss with students the materials and equipment available to make a mini solar oven.
5. Students brainstorm possible design solutions and sketch two possible design solutions. They must determine the size of the mini solar oven and what materials would be required. They select one of the sketches, justify their decision and develop an annotated design of their product, which includes the size of each part and how the parts are joined.
6. Discuss with students the different design criteria to evaluate their mini solar oven. Students collaboratively develop three to five criteria to evaluate their product.
7. Students list the materials they will use to build their mini solar oven, and explain the purpose of each, including the materials used for fastening.
8. Discuss with students the need for cooperation in sharing materials and equipment to complete the task and to adhere to safety precautions.
9. Supervise and observe the safe use of equipment and tools, allowing time for students to safely construct their mini solar oven. Students take photos of their completed product to include in their design task template.
10. Students test their finished mini solar oven by using it to cook a simple pizza or cheese toast.
11. Students collaborate to evaluate their mini solar oven against the agreed design criteria and complete their design task booklet, including providing a sequence of steps for the design solution.



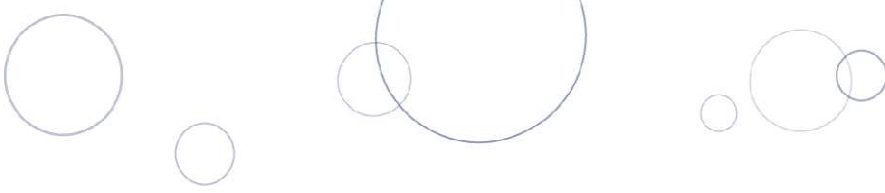
Design task booklet – Pizza in the sun

What is the problem the teacher has asked you to create a solution for?

Investigate the current uses of solar ovens. Why are they used?



Investigate the characteristics and properties of materials suitable for use in a solar oven. What did you find out?

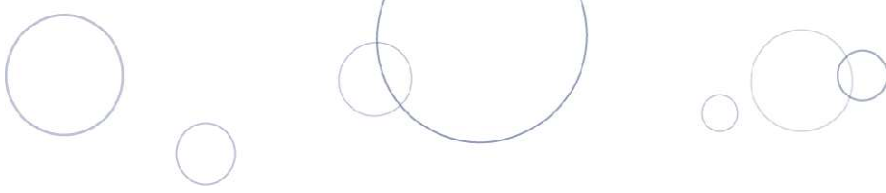


Investigate possible designs for your mini solar oven. Sketch two choices that you are considering using to build your oven. Write a short description next to each sketch.



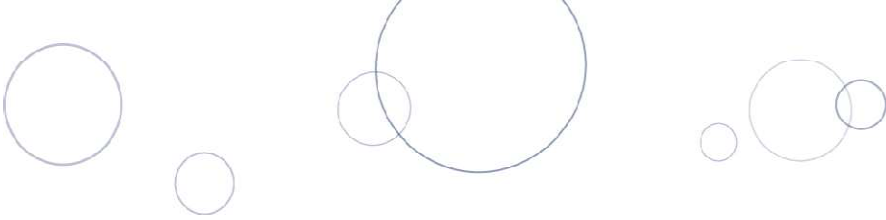
Collaboratively negotiate three to five design criteria.

Refer to your two sketches and decide which mini solar oven you will build. Explain your decision.



Design your mini solar oven to meet the set criteria. Include notes and labels to support your design and include technical names where possible.

A large, empty rectangular box with a thin black border, occupying most of the page below the text. It is intended for the student to draw and label their design for a mini solar oven.

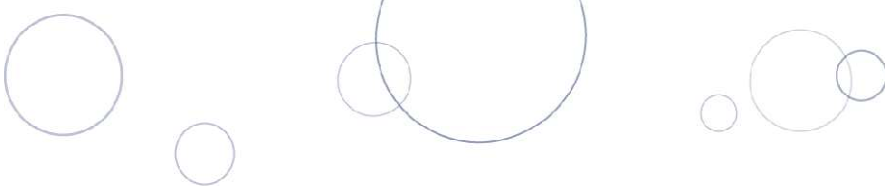


Make a list of the materials you will need.

What materials will you need to bring from home, if any?

Which materials have you chosen that are necessary for your mini solar oven to heat up?

Materials	Purpose/Why selected



You will be required to join different materials together. Draw and label the types of fastenings/joins you might use.

A large, empty rectangular box with a thin black border, intended for the student to draw and label different types of fastenings or joins.



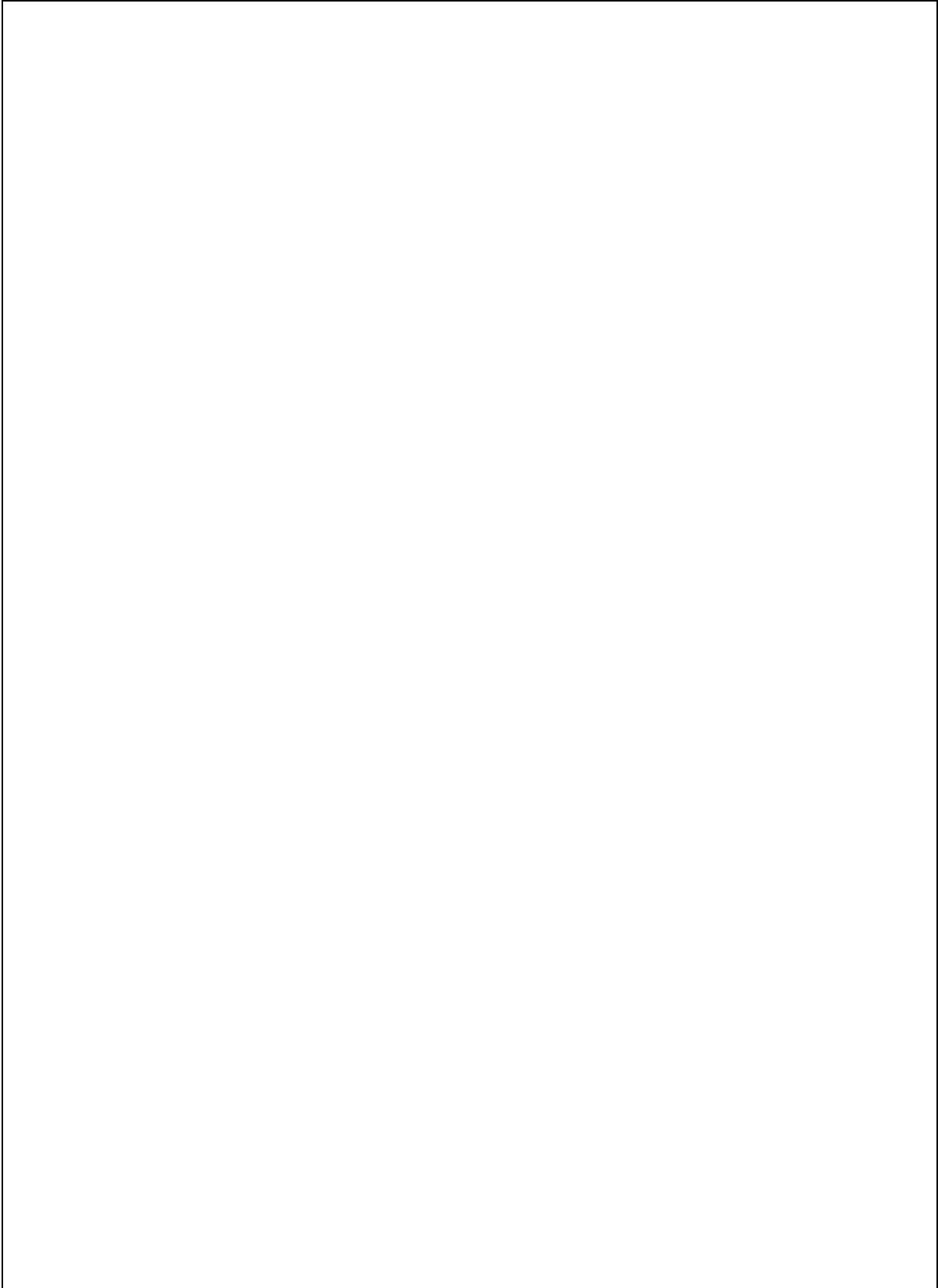
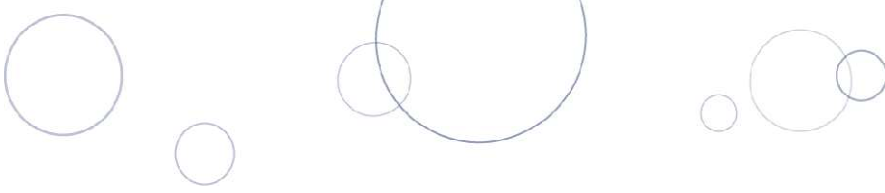
What safety rules did you apply when working with the tools and equipment? Why do you think it is important that we follow these safety rules?

Include a photo of your finished mini solar oven.

Include photos of your pizza before and after cooking.

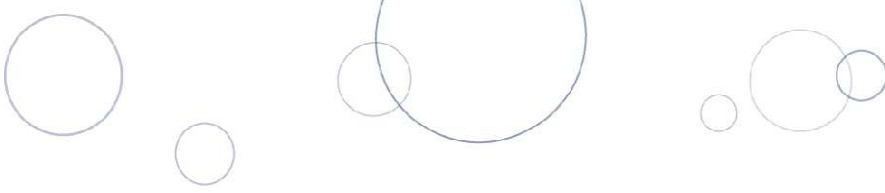
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Evaluate your mini solar oven against the design criteria.





Write a sequence of steps that someone could use, together with your original design, to reproduce your mini solar oven.



What was the most difficult part of this task? Why?

Of all the mini solar ovens in your class, which one do you think performed the best? What features contributed to its success?

What improvements would you make to your design and why?

Solar ovens are used in some refugee camps. What other places do you think they could be useful?

Marking key

Description	Marks
Design process: Investigating and defining	
Provides a description of the problem	
Clearly identifies the problem and develops explicit and sequenced steps to solve the problem	3
Identifies the problem and develops key steps to solve the problem	2
Uses broad terms to state the purpose of the task and includes some steps to solve the problem	1
Subtotal	/3
Materials and technologies specialisations	
Investigates the characteristics and properties of materials suitable for a solar oven	
Provides detailed information about materials to be used together with their characteristics and properties	5–6
Creates a plan for resources to be used and lists how and/or why they will be used	3–4
Lists materials, with some notes and/or minimal properties information	1–2
Subtotal	/6
Design process: Designing	
Completes two sketches to consider for own design including a brief description of each	
Draws detailed sketches, each with supporting explanation and labels	3
Draws annotated sketches of the mini solar oven	2
Draws a sketch with basic labels	1
Subtotal	/3
Develops final structural design of the mini solar oven, with sizes for each labelled part, using technical terms	
Draws a detailed sketch with most parts labelled and sized correctly, using suitable technical terms	3
Draws an annotated sketch with technical terms used to label parts	2
Draws a sketch with basic labels	1
Subtotal	/3
Design process: Producing and implementing/Project management	
Provides a list of materials, with brief explanations of choice of materials	
Provides a complete list with clearly identified items, that may include items from home items; clearly explains choice of materials	3
Provides a mostly complete list with items identified, that may include some items from home items; includes a simple explanation of material choices	2
Provides an incomplete list and does not identify choice of material	1
Subtotal	/3

Description	Marks
Draws the fastenings/joins with labels	
Produces a neat, accurate and clearly annotated drawing or diagram that includes all required information	3
Produces a neat and accurate, drawing or diagram that is labelled with most of the required information	2
Produces a drawing or diagram with some labels	1
Subtotal	/3
Observe working with materials, applying a safe and collaborative process	
Applies specific safety rules and considerations while working with materials, and displays full collaboration with others	3
Demonstrates awareness of safety rules when working with materials, and shows collaborative behaviour	2
Displays some awareness of safety rules when working with materials, and attempts to collaborate with others	1
Subtotal	/3
Design process: Evaluating	
Teacher evaluation of finished product	
Delivers a product completed to a high standard that resembles the design sketch	3
Delivers a product completed to a satisfactory standard that resembles the design sketch	2
Delivers a product that differs from the original sketch	1
Subtotal	/3
Evaluation comments relating to specifications and design considerations of at least three criteria	
Evaluates the mini solar oven against developed criteria and justifies the use of materials for production. Considers improvements with appropriate justification	5–6
Evaluates the mini solar oven against some of the criteria, justifying some of the materials used. Lists possible improvements with some justification	3–4
Links evaluation of the mini solar oven to criteria but expresses likes/dislikes instead of referring to design criteria. Lists some possible improvements without any justification	1–2
Subtotal	/6
Total	/33

