

PRIMED

Teacher resource



Department of **Primary Industries and Regional Development**
Department of **Training and Workforce Development**
Department of **Education**

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Teaching guide: Forestry for the future: Timber in Western Australia

Resources overview

PRIMED mission

To increase student understanding of agriculture, fisheries, fibre, forestry and food (primary industries) careers to enable Year 7–12 students to make informed career-pathway choices.

About the resource set

These resources provide rich tasks focused on the *Western Australian Curriculum* within a primary industries context.

Curriculum links

This resource is designed to be a learning pathway for Year 7 and 8 Technologies students to develop their understanding of the *Western Australian Curriculum* **Design and Technologies** content descriptions.

Technologies Context:

- Materials and technologies specialisations ([ACTDEK034](#))

Knowledge and understanding:

- Technologies and society ([ACTDEK029](#)) and ([ACTDEK030](#))

Resource set structure

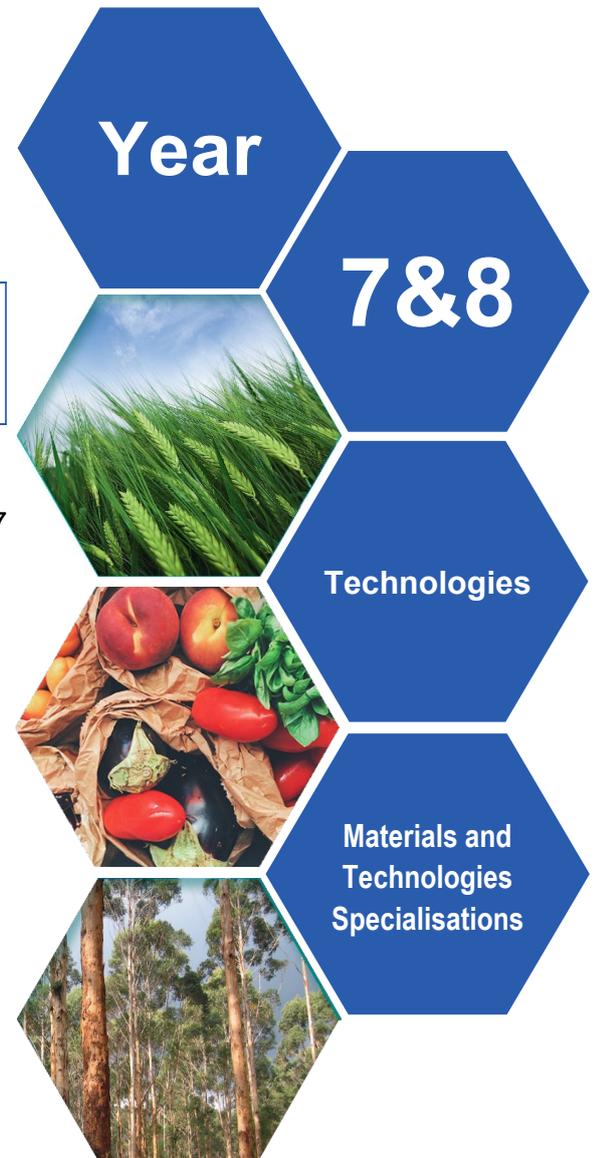
The activities contained in this resource set can be used for either Year 7 or Year 8 students with minor modifications to allow for ability level.

The package is structured in such a way as that included tasks can be undertaken consecutively as a complete work package or used individually to suit specific requirements.

Tasks do not assume existing knowledge, and all required information is included in the task sheet or associated student resource.

Across the series of tasks, students:

1. Engage with existing knowledge about modern and historical aspects of Western Australia (WA) and learn about its timber industry while building an understanding of related social, environmental and economic factors.
2. Explore the properties of various timber species including local, domestic and exotic timbers, and make links between material properties and common uses.
3. Explain how timber is produced and compare/contrast this with an alternative material. Students use the Input-Process-Output (IPO) model to describe production processes and draw conclusions about the sustainability of different materials.



Teaching and learning focus	Resources
<p>Module 1: The Western Australian timber industry</p>	<p>Student worksheets:</p> <ul style="list-style-type: none"> 1.1 The Western Australian timber industry: Virtual guided tour 1.2 The history of the Western Australian timber industry <p>Online resources: Welcome Mat The Guided Tour Welcome Mat - Historic Connection Going Bush Season 7 Episode 3: West Australian Forests Wood - The Untold Story (Full Version)</p> <p>Other resources:</p> <ul style="list-style-type: none"> Resource 1.1 Timeline of the Western Australian timber industry
<p>Module 2: Western Australian forests and timber</p>	<p>Student worksheets:</p> <ul style="list-style-type: none"> 2.1 Native forests and plantation timbers 2.2 Properties and uses of timber <p>Online resources: 3 Various demand for Victoria's plantation and native forests - YouTube Explore Wood: Break out of the ordinary The Wood Database (wood-database.com)</p> <p>Other resources:</p> <ul style="list-style-type: none"> Resource 2.1 – Properties of timber species
<p>Module 3: Timber production processes</p>	<p>Student worksheet:</p> <ul style="list-style-type: none"> 3.1 Understanding the production process <p>Online resources: From the plantation to your place – the timber production process explained How aluminium is produced Lumber Aluminium</p> <p>Resource: Resource 3.1 Production Processes</p>

Learning resources and sequence

Module 1: The Western Australian timber industry (approximately 2 hours)

Learning intentions

Students will be able to:

- Describe the main industrial types within the broader WA timber industry
- Identify key facts relating to the industry
- Differentiate between social, economic and environmental factors relating to the industry
- Explain the role of specific careers in the industry
- Characterise the evolution of societal and industrial priorities over the history of Western Australia since European settlement.

Activity 1.1- The Western Australian timber industry: Virtual guided tour

This activity gives students a broad introduction to the WA timber industry and WA's forests. Students access a "virtual tour" from the Forest Industry Federation (WA) inc (FIFWA) to explore various aspects of the industry and discover answers to a number of questions.

Activity duration:

20 minutes

Background

After accessing the FIFWA "[Guided Tour](#)" page, students work through the worksheets questions. The task gives students a background understanding of the WA timber industry and allows them to better access successive activities.

Resources

- Student worksheet 1.1
- Student internet access and devices

Ways to use this activity

If this activity is to be used as a full lesson, the topic can be introduced with a short video [like this one](#) from Planet Ark, produced as part of their "*Make It Wood - Do Your World Some Good*" program.

It may also be beneficial – especially if this task is to be undertaken early in the progression of a course – to have students brainstorm timber products that they encounter as part of their daily life. This can be used to lead into a discussion about where these products (or rather the raw material used in their production) come from. These brainstorms will be useful for Module 2, so retain copies of student work.

If this task is to be followed by Activity 1.2, students can be shown a further range of video clips at the conclusion of the virtual tour. Activity 2 addresses social issues, along with environmental and economic factors, and a number of [videos](#) located on the FIFWA website address these points.

Suggested viewing from the site could include:

1. The Sustainable Forestry Cycle
2. Economic and Social Benefits
3. Going Bush S7E3 – Western Australian Forests

The activity could also be used in conjunction with a design project, as an additional task for early finishers, or as an alternative task for students who are unable to participate in practical lessons for any reason.

Activity 1.2 - The history of the Western Australian timber industry

Students use a printed timeline to make judgements and differentiate between events relating to social, economic, environmental and infrastructure from the history of the WA timber industry.

Activity duration:

50 minutes

Background

It is recommended that students undertake Activity 1.1 in the full lesson format described above (ie incorporating videos and discussions) prior to attempting this task. This background information will allow Activity 1.2 to be completed within a single lesson.

If students have not yet had any exposure or background knowledge about the WA forestry industry, this should be introduced, either through short video or teacher-guided discussion and this will likely require the activity to be conducted over multiple sessions.

Resources

- Student worksheet 1.2
- Student resource 1.1 – Timeline
- Coloured markers/pencils/highlighters (4 colours per student)

Ways to use this activity

For Year 7 or lower ability Year 8 classes, students should be guided through the first page of the worksheet. Discuss and explain the definitions provided for social, environmental, infrastructure and economic impacts. If required, modifications can be made for ability level - for example simplifying the categorisation of events to “highlight events where something was built” or “highlight every time a new law was made”. If necessary, the glossary could be expanded to include any words or concepts that students may not have encountered. Higher ability classes can be extended by further categorising infrastructure events as relating to either social, economic or environmental factors.

Once categorisation of the timeline has been completed, there is opportunity for class discussion about how events have been categorised. Many of the events listed can be viewed in several ways, and this provides scope for debate and discussion.

Once this is complete, students can address the questions provided. The level of response expected will vary depending on age and ability level, and questions can be modified to suit individual school contexts.

If required, this task could be expanded to include an investigative report where students select a key event to research and present in either oral or visual/written form.

Online resources

[State Library Forestry – Plantation historical images](#)

[Timber Mills of Western Australian Directory](#)

[Timber Towns in Western Australia](#)

[A History of Forestry in Australia \(PDF book\)](#)

Module 2: Western Australian forests and timber

(approximately 2 hours)

Learning intentions

Students will be able to:

- Understand the difference between plantation grown and native forest timbers
- Identify sources of timber products
- Describe properties of timber and timber products
- Suggest suitable timbers based on properties required for specific applications

Activity 2.1 – Native forests and plantation timbers

Students identify timber products in their everyday lives and learn about the source of the timbers used. Students may gain insight into the way plantations and forests are managed and are introduced to the concept of illegal logging.

Activity duration:

50 minutes

Background

In this task, students learn about the differences between native forests and plantation grown timbers, identify timber products and make suggestions on how this timber may have been grown.

The video that forms part 2 of this activity takes place in New South Wales and Victoria, however plantations of both *Pinus radiata* (radiata pine) and *Eucalyptus globulus* (southern bluegum) are also located in WA, and the information delivered is directly transferrable to a WA context.

Resources

- Worksheet 2.1
- Data projector and internet access
- Timber product brainstorms from Activity 1.1 (if available)

Ways to use this activity

Students first compile a list of uses for timber and timber products. If a brainstorm was completed as part of Activity 1.1, this can be used to accelerate the process. Alternatively, this could be done in groups or crowdsourced from a whole class discussion.

In Part 2, the class watches the video [Going Bush - Various demand for Victoria's plantation and native forests](#), which describes aspects of the management and uses for Australia's plantation and native forests. It may be beneficial to have students take notes, alternatively the video can be stopped at relevant points to discuss answers to the associated question set.

Part 3 has students revisit their list of products and suggest which of the 3 forest types (native hardwood/softwood plantation/hardwood plantation) could have provided the timber used. This can be done individually or as a class and may require some research depending on the student understanding and the types of products identified. The product/uses list can be reduced in size to suit time available.

It is possible to undertake Parts 1 and 3 without viewing the video. However, it will likely be difficult for students to understand the difference between forest types and their associated products. An alternate way of delivering this content would therefore be required. This may be a research task, an excursion or teacher delivered slideshow.

This activity does not cover the differences between hardwoods and softwood and this provides an opportunity for an additional task or extension activity.

Activity 2.2 – Properties and uses of timber

Activity duration:

50 minutes

Background

In this activity, students make connections between various properties of timber and the ways that different timber species are used. These properties are:

- Strength
- Hardness
- Durability
- Stability
- Growth rate
- Aesthetics

These properties link directly to the common uses for specific timber species. Identifying a connection between a specific property and an application enables students to form clear understandings of why these properties are important and how they can be used to the advantage of the designer.

Resources

- Student worksheet 2.2 – Properties and uses of timber
- Student resource 2.1 – Properties of timber species
- Internet access and devices (optional)

Ways to use this activity

In this task, students are required to identify properties that are necessary for specific timber products. Depending on the ability level and age of the class, this could be done individually, in small groups, or as a class. Students will typically have at least a base knowledge of some of these properties but will require prompting and clarification in order to apply their understanding. Consider using class discussions or group based instructional strategies to strengthen understanding.

Some properties lend themselves to practical demonstrations – namely strength and hardness. These could involve:

- Having students strike a piece of pine and a piece of jarrah with a ball pein hammer and measure the size of the dent (hardness)
- Preparing thin strips of timber, arranging them to span a gap and stacking weights/suspending a bucket and slowly filling it with water in order to test weight bearing capacity (strength)

This activity also lends itself to technology based instructional tools, such as Kahoot or other polling/quiz tools. Set up appropriately, students could be asked to vote for the combination of properties they believe is most relevant to each product, and the results used to fill in the worksheet. This approach would be particularly helpful for Year 7 and lower ability Year 8 classes that may find this step difficult to complete individually. If required, the properties column could also be pre-filled to reduce the time required for this task.

Once students have completed the properties column, they use Resource 2.1 to identify appropriate timbers for each application. Resource 2.1 – Properties of timber species contains common WA timber species, along with some found in the eastern states, and some imported exotic timbers. These can be modified to suit the context of the class as required.

In more advanced classes, it may be beneficial to have students use their own research to suggest appropriate timber species. This will allow greater range of responses and require more advanced analytical skills to determine suitability. Care should be taken to ensure students are considering the availability and cost of these timbers in WA, as this directly impacts the suitability of the timber.

Module 3: Timber production processes

(approximately 2 hours)

Learning intentions

Students will be able to:

- Use the IPO model to describe the production processes involved in the production of timber.
- Compare and contrast these processes with those used in the production of aluminium
- Make judgements about the environmental impacts of different production processes

Activity 3.1 – Understanding the production process

Students are introduced to the IPO model. Using this model, they describe the processes involved in the production of timber and compare these to those required to produce an alternative material (aluminium). Questions then guide students to explain the environmental impact of these different processes and make judgements about sustainability.

Activity duration:

2 x 50 minutes

Background

Students use a text-based description of the processes associated with the production timber and aluminium. The IPO model characterises elements of production based on their role in the process. Using this model, students are able to simplify production elements enough, so they are able to compare different processes and make judgements about the sustainability of products.

Resources

- Worksheet 3.1- Understanding the production process
- A3 paper
- Coloured pencils/markers

Ways to use this activity

The worksheet gives the example of honey production, as it is a relatively simple process that most students have had some level of exposure to. If appropriate, this can be replaced with another production process more suitable for the context of the class. Note: the context of the example should not be similar to the production of timber or metals from mineral ores.

Students are asked to characterise the elements of the production process as either input, process or output, and present this as a flow chart. A key aspect of this task is the way that the output from a process often becomes the input for a successive process, ie trees become sawlogs, sawlogs become boards, boards become furniture (3 IPO cycles). This should be emphasised when delivering this task to avoid multiple processes being combined into a single IPO cycle.

In Year 7, and less independent Year 8 classes, it would be beneficial to identify the production elements in each process in advance. These could be presented as a list or made into cut-out images/icons that students could glue into their flow charts. This task also lends itself to group work and could be completed in groups of 2-4 on butcher's paper or A1 cardstock.

Once these flow charts are complete, students answer a number of questions. When addressing these questions, the level of teacher input will vary depending on ability level. In order to assist students to answer each question, teachers may facilitate class discussions or provide additional information as required.

As an alternative to the text-based descriptions of production processes, classes with literacy issues may benefit from a visual representation of the processes, for example a video clip describing each process.

Useful resources

Videos

Current Industry

[Illegal Logging](#)

[Wood – The Untold Story](#)

[The Sustainable Forestry Cycle](#)

[WAs Sustainable forest and timber industries](#)

[Community and WA forest industries](#)

[Sustainable forest management in Western Australia](#)

[WA's Plantation Forests](#)

[Faces of Forestry](#)

[Going Bush Season 7 Episode 3 West Australian Forests](#)

[3 Various demand for Victoria's plantation and native forests](#)

Historical

[Timber Getting in Western Australia](#)

[Timber Town](#)

More [videos](#) are also available at the FIFWA website.

Useful links – Western Australian government entities

[Government of Western Australia – South West native forests](#)

Fact sheets

- Posters
- Reliable research information

[Government of Western Australia – Sustainable forest management](#)

Reports and legislation

[Department of Parks and Wildlife – Forests](#)

Reliable research information

- Easily digestible information about legislation
- Links to other industries

[Department of Agriculture - Forestry](#)

Forest type profiles

- Export information & legislation

[Department of Agriculture – Maps and other graphics](#)

- Wide range of maps, including forest types and distributions

Useful links – Other

Timber Industry

[Forest Industries Federation \(WA\)](#)

[Welcome Mat: The Guided Tour](#)

[Forest Learning](#)

Wood as a sustainable material

[Think Wood](#)

[Make it Wood](#)

[Forest & Wood Products Australia](#)

[Wood Solutions](#)

Properties and production of timber

[The Wood Database](#)

[How Products are Made](#)

Acknowledgements

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