





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



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# Student resource 1.1

## **Timeline of the Western Australian timber industry**

Pre	1829
Indigenous Australians managed the lands	cape for <b>many thousands of years</b> through
the use of agriculture, thinning	iorests, and controlled burning.
First commilling Mr. Eliza (now known as Kinge Park) 1923	1829 First European settlement in WA. Samples of wood sent to England
HISE SAWITHIN AL MIL, LIIZA (HOW KHOWH AS KINGS FAIR) 1855	1836 200 tons of wood <b>exported</b> to England
First forest regulations 1842	1844 Steam powered commill established in Cuildford
Sandalwood <b>exports</b> established. Buildings constructed from 1845 local timbers, particularly Eucalyptus Marginata (Jarrah).	1844 Steam powered sawmin established in Guildiord
Large <b>sawmill</b> built at Quindalup 1858	1999 convertabour provided for foresary industry
1400 km of <b>railway built</b> , 200 km of which is owned and operated 1880s	1872 First large <b>sawmill</b> opens at Jarrahdale with its own port at Rockingham
Gold rush sees <b>railways</b> extended into South West forests 1890s	1882 protect and conserve forests
Department of Woods and Forests established 1896	1895 New gove, lorest report recommends creation of a <b>Porestry Department</b>
Royal Commission into forestry 1903	1898 Govt passes Land Act limiting WA timber leases to 30,000 hectares
Hewing stops in <b>virgin forests</b> 1914	1905 <b>Bunning Brothers</b> expands from construction into sawmilling, soon becomes the largest <b>timber exporter</b> in WA
Forests Department established	1917 First <b>permanent growth plot</b> established at 100 Year Forest
Royal Commission into finance & administration of Forests Act 1922	1920 Plant built at Crawley to produce paper pulp from Karri and Marri
Sandalwood Act passed, regulating production of sandalwood 1929	1925 Big Brook first area of <b>cutover karri forest</b> declared as <b>State Forest</b>
Bad fire year leads to overhaul of fire legislation, Bush Fires Act passed 1937	1930s forests during the Great Depression
Displaced persons from Europe move into timber industry work 1940s	1939 Timber <b>production decreases</b> due to enlistment of workers in <b>armed forces</b>
Devastating bush fire season leads to Royal Commission	1951 Royal Commission into forestry sets a target of 40,000 ha for planting of conifers - predominantly radiata pine
into bush fire management	First programs implemented to halt the spread of <b>dieback</b> .
Softwood Forestry Agreements Act provides federal assistance for states to establish softwood plantations	More than 70,000 na <b>quarantined</b>
Forests Department sets aside 40,000 ha near Manjimup to	1971 Environmental Protection Authority established
protect rare animals. Other areas follow.	1975 Export market for woodchips to Japan established for paper
establishment of picnic facilities, nature trails and bushwalk tracks.	production; woodchip plant established near Manjimup
Cyclone Alby destroys 900 ha of established <b>plantation</b> , 300 ha	1977 Karri yield reviewed and made publicly available for the first time
Formation of <b>Dept of Conservation and Land Management</b> , merging	1982 100,000 ha of land around Walpole dedicated as a <b>national park</b>
the Forests Dept, National Parks Dept. and parts of Fisheries Dept.	1999 Regional Forests Agreement signed.
Government encourages business to exit	All old growth logging ceased
Encost Management Plan sots aside 60% of SW	Forest Products Commission split from CALM.
forests for conservation, 40% for multiple use. 2003	2006 Formation of <b>Department of Environment and Conservation</b> (formerly CALM)
Bluegum <b>plantations</b> established near Albany 2009	2013 Formation of Department of Parks and Wildlife
Northcliffe <b>bush fires</b> 2015	
55,000 ha burne	2016 Yarloop <b>bush fires</b> Extensive pine resources devastated
Regional Forest Agreement endorsed. 2018	
LEGEND	
Social impact	
Environmental conservation	
Economic impact	
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# **Student resource 2.1**

## **Properties of timber species**

	Strength	Hardness	Durability	Stability	Growth rate	Aesthetics
Bluegum <i>Eucalyptus globulus</i>	Very high	Very hard	High Rot resistant Susceptible to insect attack	Good	Fast	Pale yellow-brown. Attractive grain patterns
Jarrah Eucalyptus marginata	High	Hard	Very high Rot and pest resistant	Very good	Slow	Light red to dark purple-brown
Karri Eucalyptus diversicolor	Very high	Very hard	Moderate Moderately rot resistant Susceptible to termites	Good	Slow	Reddish brown
Marri Corymbia calophylla	Moderate	Moderate	Moderate Susceptible to pests and rot	Good	Slow	Light brown to pinkish yellow Distinctive black gum veins are desirable for aesthetic applications but can compromise strength
Radiata Pine Pinus radiata	Moderate	Low	Low in natural form (Able to be treated to prevent pest attack and rot)	Moderate	Fast	Pale yellowish-white Wide growth rings and few knots
Tasmanian Oak <i>Eucalyptus regnans</i>	Moderate / high	Moderate	Moderate Resistant to rot Moderate insect resistance	Moderate	Slow	Medium yellow to light pinkish-brown Very straight grained
Cypress Callitris columellaris	Moderate	Moderate	High Pest resistant Rot resistant	High	Slow	Light tan to brown, commonly with darker reddish-brown streaks
American White Oak <i>Quercus alba</i>	High	Moderate	High rot resistant Susceptible to insect attack	Moderate	Slow	Light to medium brown, commonly with an olive cast Attractive flecked ray patterns
Beech <i>Fagus sylvatic</i>	High	Moderate / high	Low Susceptible to rot and insect attack	Moderate	Medium	Pale cream colour, sometimes with a pink or brown hue Surfaces tend to be very plain with a silvery fleck pattern
Merbau Intsia bijuga	Very high	High	Very high Resists rot and insect attack	Moderate	Slow	Orangish-brown colour when freshly cut, which ages to a darker reddish-brown
Meranti Shorea spp. (multiple species)	Moderate	Very low	Low Susceptible to rot and insect attack	Moderate	Fast	Ranges from a pale straw colour to a darker reddish-brown.





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# **Student resource 3.1**

### **Production processes**

Different materials require different processes to produce. Timber must be harvested from its source (forests or plantations) and processed from saw logs into useable timber products, while mineral-based materials like metals and plastics must be mined and extracted before they can be made into a finished product.

## The timber production process

**Timber** grows naturally in **native forests** or can be planted and managed in **plantations**. Trees are **harvested** as logs and transported to processing facilities called **mills**. The bark is removed, and **sawyers** use large saws and other machinery to break the logs down into useable pieces. Logs can be processed into many forms, including:

- Boards and posts for the construction and furniture industries
- Wood pulp for paper production
- Woodchips, thin **veneers** and fibers for the production of **manufactured timbers**.

Sawyers aim to maximise the useable timber taken from each log, but some is lost as sawdust.

These raw materials are then sent to **secondary processing** facilities where they are manufactured into their final form – whether that is a chair, a sheet of writing paper, or flooring materials.



Image 3.1.1 Truck hauling sawlogs

## The aluminium production process:

**Aluminium** is a lightweight metal that has many applications. It is the most common metal on Earth but does not occur naturally in a useable from. It is most commonly found in the form of **bauxite**, which is a rocky substance that contains aluminium and a number of other unwanted **impurities**.



Image 3.1.2 aerial view of an alumina plant

small pieces called ingots

Bauxite is mined and must be go through a number of processes in order to become pure aluminium. First, the **bauxite** goes to a refinery. There it is mixed with **caustic soda** which removes impurities and produces **alumina**, a purer form of aluminium. This produces a lot of waste material, which is stored in a large lake or dam.

This **alumina** is transported to a **smelting facility** where it undergoes a process called **electrolysis**. In this process, the **alumina** is heated to nearly 1,000 degrees Celsius and an electric current is passed through it. This produces pure molten **aluminium**, which is then formed into

These **ingots** are shipped to other facilities which turn them into all kinds of different shapes and sizes, depending on their intended use. This includes thin sheets, tubes, bars and beams. These different forms are then shipped to **manufacturers** to be made into finished products.





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#### Images

Image 3.1.1 'B double logging truck in Australia' Fir0002 at the English-language Wikipedia, <u>CC</u> <u>BY-SA 3.0</u> available at:

<<u>https://commons.wikimedia.org/wiki/File:B double logging truck in Australia.jpg</u>> accessed 15 June 2021

Image 3.1.2 'Ajka Alumina Plant, Hungary (10759011086)' Jeroen Komen, <u>CC BY-SA 2.0</u> available at: <<u>https://commons.wikimedia.org/wiki/File:Ajka Alumina Plant, Hungary (10759011086).jpg</u>> accessed 15 June 2021



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