

FASCINATING FOSSILS

**SCIENCE | STAGE 5
EDUCATOR-LED**

ACTIVITY 1

AN ANCIENT AUSTRALIAN GIANT

INTRODUCTION

The megafauna are large animals such as mammoths that mostly went extinct at the end of the last ice age. The megafauna of Australia included the iconic giant *Diprotodon*, the largest marsupial that has ever been found, as well as giant short-faced kangaroos (*Procoptodon*), giant echidnas (*Zaglossus*) and goannas (*Megalania*). The extinction of megafauna was probably due to environmental and ecological factors.

OBJECTIVE

To use fossil evidence to identify the closest living relative of the *Diprotodon*.

RESOURCES

- Booklet of photographs and information cards.
- Set of *Diprotodon* fossil casts.
- Wombat and a Tasmanian Devil skulls.
- Cast of *Diprotodon* skull.

ACTIVITY 1.1

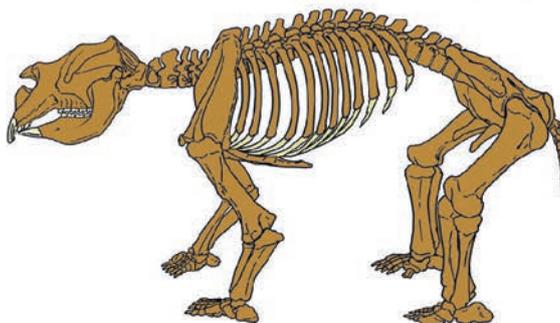
With the help of your booklet, identify the five fossilised body parts of the *Diprotodon* in your kit. Label them on the diagram below and write a short description of the function of each body part.

1.

3.

4.

2.



5.

ACTIVITY 1.2

Look at information Card A and B in your booklet and compare the skulls of the Common Wombat, Tasmanian Devil and *Diprotodon* by completing the table below.

	Tasmanian Devil	Diprotodon	Common Wombat
Upper incisors (front teeth) number and size in upper jaw		Two long, protruding front incisors and four shorter ones behind.	
Lower incisors (front teeth) number and size in lower jaw	6 small upright incisors.		
Canines (just behind incisors) present or absent			
Toes on back foot number and size		Four long toes and one reduced in size.	Four long toes and one reduced in size.

Based on your observations, which of the two extant (surviving) animals do you think is the closest relative of the *Diprotodon*?

Explain how you came to this conclusion. _____

ACTIVITY 2

TALES FROM TALBRAGAR

INTRODUCTION

Talbragar is a fossil site that contains one of the most significant Jurassic terrestrial fossil deposits in Australia. Beautiful specimens are found in museums around the world, including the '200 Treasures of the Australian Museum' Westpac Long Gallery.

OBJECTIVE

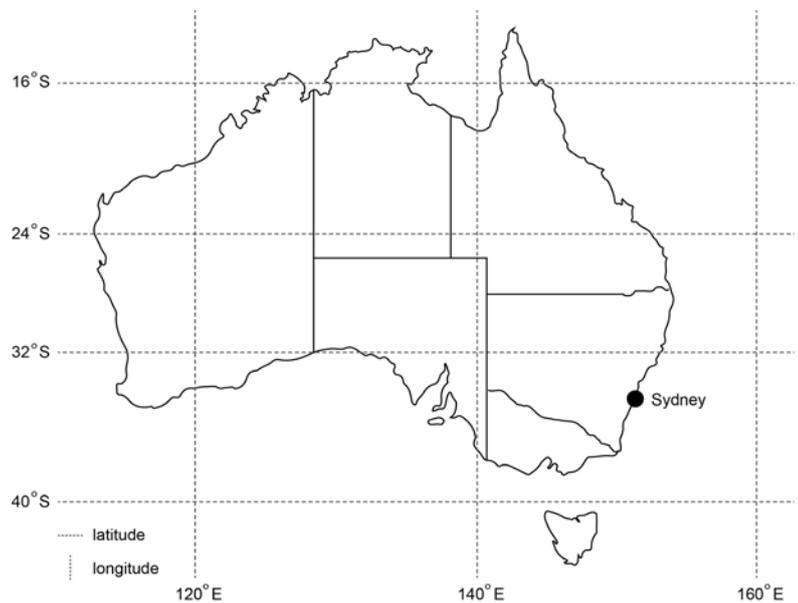
To learn about past environments and relationships between extinct and living species of Australian plants by interpreting fossils.

RESOURCES

- A set of Talbragar fossils.
- Three plant specimens.
- Information cards.
- Sandpaper panel.

ACTIVITY 2.1

Latitude and longitude co-ordinates mark the exact position of a landmark on Earth. Sydney is located at 33.9°S, 151.2°E on the map. **Find the co-ordinates of Talbragar on the information card and mark its location on the map.**



ACTIVITY 2.2

The Earth's history can be shown as a time scale which is based on the relative age of layers of rock. The relative age of a fossil can be determined from the rock layer in which it was found. **Find the age of rocks at Talbragar on the information card and mark it on the timeline below.**

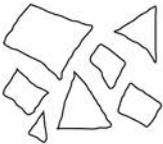
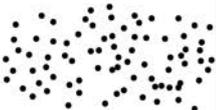
During which geological period did the rocks at Talbragar form? _____

Eon	Phanerozoic											Phanerozoic														
Era	Paleozoic					Mesozoic						Cenozoic														
Period	Carboniferous		Permian			Triassic			Jurassic			Cretaceous		Paleogene			Neogene			Quat.						
Epoch	Mississippian	Pennsylvanian	Cisuralian			Gondwanan			Lopingian			Lower			Upper			Paleocene	Eocene		Oligocene	Miocene		Pliocene	Pleistocene	Holocene
age (Ma)	359	347	331	323	315	307	299	273	259	252	247	237	201	174	164	145	101	66	56	34	23	5	2.6	0.01	present	

ACTIVITY 2.3

Fossils form in sedimentary rocks, which form from the breakdown of pre-existing rocks. Grain size is used to classify a rock and provide information about the environment in which it formed.

Examine the rock samples and 'sand paper panel' to get a feel for the grain size in different sedimentary rocks. Now take a close look at your Talbragar fossils. **Use the diagram below to help you decide in which type of sedimentary rock the fossils formed?**

Type of Sedimentary Rock					
Sediment	 Rounded pebbles	 Angular fragments	 Sand	 Silt	 Clay
Size	Coarse (> 2 mm)		Medium (1/16 - 2 mm)	Fine (1/256 - 1/16 mm)	Very Fine (<1/256)
Rock	Conglomerate 	Breccia 	Sandstone 	Siltstone 	Shale 

ACTIVITY 2.4

Draw labelled diagrams of the organisms you can see preserved in your fossils:

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ACTIVITY 2.5

Based on your observations, and with the help of the Talbargar Information Card, what do you think the environment was like at the time these fossils formed?

ACTIVITY 2.6

Look at your three Australian plant specimens (Wollemi Pine, Sydney Blue Gum, Saw-tooth Banksia). Do any of the fossilised plants resemble one of these specimens? Pay special attention to the length and shape of the leaves, as well as the orientation of the veins. Based on your comparison, which plant do you think is most closely related to your identified fossil? Explain.
