

Teacher Notes

Themes

- Prehistoric Australia
- Flight and evolutionary adaptations
- Prehistoric biodiversity

Key learning outcomes

- Understand the diversity of prehistoric life that existed in Australia.
- Explore flying reptiles and how they adapted to survive in ancient environments.
- Identify geographical features of prehistoric Australia, including the Eromanga Sea.
- Understand how palaeontologists use fossils to learn about the past.

Key curriculum areas

- **Science:** Science Understanding (Biological sciences); Science Inquiry
- **English:** Language; Literature; Literacy
- **HASS:** Geography
- **The Arts:** Visual Arts
- **Cross-curriculum Priority:** Aboriginal and Torres Strait Islander Histories and Cultures

Publication details

Pterosaurs of the Desert Ocean

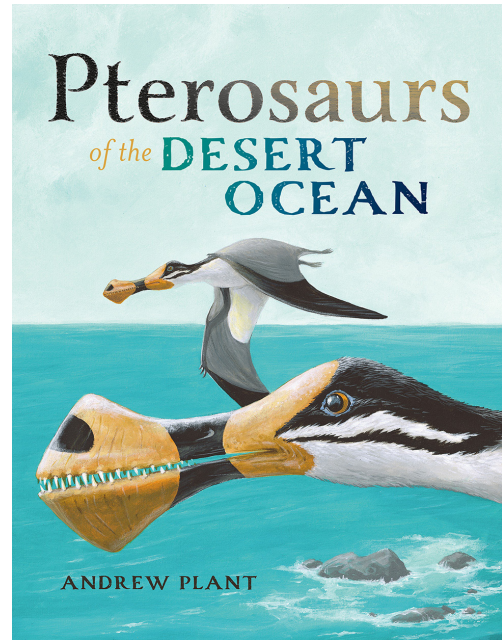
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Pterosaurs of the Desert Ocean

Andrew Plant

About the book

A pterosaur glides over a desert ocean.

Taking flight across prehistoric Australia, she searches for her family along the shores of the great Eromanga Sea. Follow her journey and discover a time when dinosaurs dominated the land and pterosaurs ruled the skies.

Step back over 100 million years in this engaging and exquisitely illustrated book by Andrew Plant.

Recommended for

Readers aged 6 to 12 (Years 1 to 6)



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About the author/illustrator

Andrew Plant trained as a zoologist, but has been an illustrator and author for over 30 years. He loves creating stories about animals, whether they are alive or extinct.

Pre-reading questions or activities

Ancient Australia

What do you think Australia looked like millions of years ago? Was it the same shape? What did the landscape look like?

Flying reptiles

At first, you might think pterosaurs were dinosaurs. Like dinosaurs, they were reptiles, but they could fly. What physical features do you think helped them take to the skies?

Can you think of any animals (besides birds) that can glide or fly? How do they do it?

Discussion questions

Science

1. In the story, *Ferrodraco* the pterosaur faces many challenges, such as storms, predators and hunger. What physical and behavioural adaptations might have helped her to survive?
2. *'Within days of hatching, the flaplings are able to fly.'*
Why do you think these baby pterosaurs evolved to be able to fly so soon after hatching?
3. We see so many dinosaurs in this book. They look strange and wonderful, and so different to many of the animals we have on Earth today. Yet if you peer into the rockpool on pages 10–11, we can see some shells and molluscs that look no different to the ones we see today. Why do you think these creatures still look the same after millions of years?

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4. *'100 million years ago, an ocean splits Australia in two.'*

At the back of the book the author provides an illustration of what Australia looked like 100 million years ago, when the Eromanga Sea divided it. It stretched from the top of Australia, down to New South Wales, and was wide enough to cover parts of Brisbane all the way to Western Australia. Today this is all land, and much of it desert, but what fossils do you think you might find if you searched in areas that were once covered by this ancient ocean?

English

1. In this book, only one animal from present day Australia makes an appearance. Which animal is it, and why do you think the author chose this animal?
2. The author often describes groups of dinosaurs as herds. This is called a collective noun, which is used to describe groups of people, animals or things. What other collective nouns can you find in this story?

HASS

1. Look at a map of Australia today and compare it to the map of the Eromanga Sea provided in the book. What parts of modern Australia can you see on the map of the Eromanga Sea?
Would your home be safe or underwater?
What do you think life would be like if the Eromanga Sea still existed and Australia still looked like this?
2. The Eromanga Sea is one of many ancient environments from prehistoric Australia, and the rest of the world. Why do you think it's important for scientists to study these ancient environments?

The Arts

1. All that remains of most dinosaurs are bones and fossils, yet this book is illustrated with dinosaurs covered in feathers, skin and scales of all colours. How do you think scientists and illustrators know how to draw dinosaurs only using bones and fossils for reference?

Aboriginal and Torres Strait Islander Histories and Cultures

1. We see many incredible Australian creatures from the Cretaceous Period in this book, but they are not the only prehistoric creatures to have existed in Australia. For tens of thousands of years, Indigenous Australians have lived across Australia, observing and caring for Country, and their oral histories, Dreaming stories and rock art tell of megafauna and giant birds that once roamed Australia.



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What do these stories tell us about Aboriginal and Torres Strait Islander histories and how the First Peoples interacted with the ancient animals of Australia?

How does this knowledge connect to the fossils and scientific evidence we find today?

Activities

Science

Wings for different things

Pterosaurs had unique wings that reached all the way to their hind legs, and they could even be used for walking when they were on the ground. Different species of pterosaurs had different wing shapes: some were broad, others were narrow. What sort of flying behaviours do you think their wings were adapted for?

In this activity, you will create some simple model aeroplanes to replicate different wings and explore how wing shape affects flight.

Materials: Paper, ruler, pencil, tape, scissors, cardboard.

Safety: Be careful when using scissors, or ask an adult for help.

Steps:

1. Fold and cut different wing shapes out of the paper or cardboard (for example, wide, narrow, curved, long, short, straight). Use nature to inspire the different wings you create.
2. Test your designs by gliding each wing through the air.
3. Record how each design travels and discuss why this is.

Extension: Compare your designs to the wing structure of modern birds or bats, and how this helps them in nature.

Australian dinosaurs

The author cleverly uses the journey of the pterosaur to introduce us to many of the other dinosaurs that were roaming Australia millions of years ago.

With your class make a list of all the dinosaurs you see in the book. Then break up into pairs or small groups to research and illustrate each one. Once you are done you will be able to combine your work and create an encyclopedia of Australian dinosaurs.

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Singing and dancing

'Pterosaurs wave their heads and call, trying to find a mate.'

This is an example of prehistoric creatures performing certain behaviours to find and impress potential breeding partners. There are many examples of mating rituals in nature, and they get particularly complicated and intricate in the world of birds.

Research and select a mating ritual from the natural world and write a description to share with your class. From singing and dancing, building bowers or murals, to the offering of gifts, there are so many unique behaviours to explore.

English

Side quest

Thinking about the many different dinosaurs we are introduced to in this story, what were they doing? What were they doing before the pterosaur passed them by, and what did they do after the pterosaur had left?

Choose one of the dinosaurs and write about their unique prehistoric journey. Use information from the book to help you, such as their behaviours, their environment and anything else you can discover.

What do they see? What trouble do they find themselves in? Where do they travel, and why?

Baby names

The author uses the term 'flaplings' to refer to baby pterosaurs that are ready for flight. There are many names like this that are used for infant animals, such as 'joey' for young kangaroos and possums, 'puggle' for echidnas and platypuses, and 'pup' for rats and bats.

Choose an Australian animal, and then see if you can come up with a new and creative name for its baby.

For some inspiration, recently there have been suggestions of calling a baby platypus a 'platypup'. What can you come up with?

HASS

As we have seen in this book, the world and its continents have changed many times over the history of the Earth. Let's try to make our own continents and our own maps today.

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First, check out this artist and how they use rice to create incredible, never-before-seen lands, and turn them into real maps!

<https://thecozyartteacher.com/how-to-make-a-rice-fantasy-map/>

Now it's your turn: follow their instructions and make your very own map. Remember to use all the features of a traditional map: Border, Orientation, Legend, Title and Scale ('BOLTS').

The Arts

Artists and scientific illustrators do an amazing job depicting what dinosaurs and other prehistoric creatures might have looked like from nothing more than a pile of bones. Do you think you could do the same?

Using the following pictures of fossil skeletons and your imagination, choose one and then draw around the bones, creating the body of your very own prehistoric creature:



Does it have wings like pterosaurs, or long and skinny legs? Does it have feathers or scaly skin? Is it brightly coloured or dull and camouflaged?

(Image credit: GreenSkyStudio/Shutterstock.com)

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Australian Curriculum Links (Version 9.0)

Year level	Learning area: Science	Other learning areas
Years 1/2	<p>Science Understanding: Biological sciences</p> <ul style="list-style-type: none"> Identify the basic needs of plants and animals, including air, water, food or shelter, and describe how the places they live meet those needs (AC9S1U01) <p>Science Inquiry: Planning and conducting</p> <ul style="list-style-type: none"> Suggest and follow safe procedures to investigate questions and test predictions (AC9S2I02) 	<p>English: Language: Text structure and organisation</p> <ul style="list-style-type: none"> Explore how texts are organised according to their purpose, such as to recount, narrate, express opinion, inform, report and explain (AC9E1LA03) <p>Language for expressing and developing ideas</p> <ul style="list-style-type: none"> Experiment with and begin to make conscious choices of vocabulary to suit the topic (AC9E2LA09) <p>English: Literature: Literature and contexts</p> <ul style="list-style-type: none"> Discuss how language and images are used to create characters, settings and events in literature by First Nations Australian, and wide-ranging Australian and world authors and illustrators (AC9E1LE01) <p>English: Literacy: Texts in context</p> <ul style="list-style-type: none"> Discuss different texts and identify some features that indicate their purposes (AC9E1LY01) Identify how similar topics and information are presented in different types of texts (AC9E2LY01) <p>Interacting with others</p> <ul style="list-style-type: none"> Use interaction skills including turn-taking, speaking clearly, using active listening behaviours and responding to the contributions of others, and contributing ideas and questions (AC9E1LY02) Use interaction skills when engaging with topics, actively listening to others, receiving instructions and extending own ideas, speaking appropriately, expressing and responding to opinions, making statements, and giving instructions (AC9E2LY02) <p>The Arts: Visual Arts</p> <ul style="list-style-type: none"> Experiment and play with visual conventions, visual arts processes and materials (AC9AVA2D01) Use visual conventions, visual arts processes and materials to create artworks (AC9AVA2C01) <p>HASS: Geography</p> <ul style="list-style-type: none"> How places can be spatially represented in geographical divisions from local to regional to state/territory, and how people and places are interconnected across those scales (AC9HS2K03)
Years 3/4	<p>Science Understanding: Biological sciences</p> <ul style="list-style-type: none"> Compare characteristics of living and non-living things and examine the differences between the life cycles of plants and animals (AC9S3U01) <p>Science Inquiry: Planning and conducting</p> <ul style="list-style-type: none"> Use provided scaffolds to plan and conduct investigations to answer questions or test predictions, including identifying the elements of fair tests, and considering the safe use of materials and equipment (AC9S4I02) 	<p>English: Language: Text structure and organisation</p> <ul style="list-style-type: none"> Describe how texts across the curriculum use different language features and structures relevant to their purpose (AC9E3LA03) <p>English: Literature: Examining literature</p> <ul style="list-style-type: none"> Discuss how an author uses language and illustrations to portray characters and settings in texts and explore how the settings and events influence the mood of the narrative (AC9E3LE03) <p>English: Literacy: Texts in context</p> <ul style="list-style-type: none"> Recognise how texts can be created for similar purposes but different audiences (AC9E3LY01) <p>Interacting with others</p> <ul style="list-style-type: none"> Listen for key points and information to carry out tasks and contribute to discussions, acknowledging another opinion, linking a response to the topic, and sharing and extending ideas and information (AC9E4LY02) <p>The Arts: Visual Arts</p> <ul style="list-style-type: none"> Experiment with a range of ways to use visual conventions, visual arts processes and materials (AC9AVA4D01) Use visual conventions, visual arts processes and materials to create artworks that communicate ideas, perspectives and/or meaning (AC9AVA4C01)

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<p>Years 5/6</p>	<p>Science Understanding: Biological sciences</p> <ul style="list-style-type: none"> Examine how particular structural features and behaviours of living things enable their survival in specific habitats (AC9S5U01) Investigate the physical conditions of a habitat and analyse how the growth and survival of living things is affected by changing physical conditions (AC9S6U01) <p>Science Inquiry: Planning and conducting</p> <ul style="list-style-type: none"> Plan and conduct repeatable investigations to answer questions, including, as appropriate, deciding the variables to be changed, measured and controlled in fair tests; describing potential risks; planning for the safe use of equipment and materials; and identifying required permissions to conduct investigations on Country/Place (AC9S5I02) 	<p>English: Language: Text structure and organisation</p> <ul style="list-style-type: none"> Describe how spoken, written and multimodal texts use language features and are typically organised into characteristic stages and phases, depending on purposes in texts (AC9E5LA03) Explain how texts across the curriculum are typically organised into characteristic stages and phases depending on purposes, recognising how authors often adapt text structures and language features (AC9E6LA03) <p>Language for expressing and developing ideas</p> <ul style="list-style-type: none"> Explain how the sequence of images in print, digital and film texts has an effect on meaning (AC9E5LA07) <p>English: Literature: Examining literature</p> <ul style="list-style-type: none"> Examine the effects of imagery, including simile, metaphor and personification, and sound devices in narratives, poetry and songs (AC9E5LE04) <p>Creating literature</p> <ul style="list-style-type: none"> Create and edit literary texts that adapt plot structure, characters, settings and/or ideas from texts students have experienced, and experiment with literary devices (AC9E6LE05) <p>English: Literacy: Interacting with others</p> <ul style="list-style-type: none"> Use interaction skills and awareness of formality when paraphrasing, questioning, clarifying and interrogating ideas, developing and supporting arguments, and sharing and evaluating information, experiences and opinions (AC9E6LY02) <p>Analysing, interpreting, and evaluating</p> <ul style="list-style-type: none"> Analyse how text structures and language features work together to meet the purpose of a text, and engage and influence audiences (AC9E6LY03) <p>The Arts: Visual Arts</p> <ul style="list-style-type: none"> Use visual conventions, visual arts processes and materials to plan and create artworks that communicate ideas, perspectives and/or meaning (AC9AVA6C01) <p>HASS: Geography</p> <ul style="list-style-type: none"> The management of Australian environments, including managing severe weather events such as bushfires, floods, droughts or cyclones, and their consequences (AC9HS5K05) Australia's interconnections with other countries and how these change people and places (AC9HS6K05)
<p>All</p>	<p>Cross-curriculum Priority: Aboriginal and Torres Strait Islander Histories and Cultures</p> <ul style="list-style-type: none"> First Nations communities of Australia maintain a deep connection to, and responsibility for, Country/Place and have holistic values and belief systems that are connected to the land, sea, sky and waterways (A_TSICP1) 	

Related books from CSIRO Publishing

For younger readers:

- *Dinosaur Questions & Answers!* (<https://www.publishing.csiro.au/book/8034>)
- *Diprotodon: A Megafauna Journey* (<https://www.publishing.csiro.au/book/8087>)
- *The Opal Dinosaur* (<https://www.publishing.csiro.au/book/8088>)

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For older readers:

- *Every Rock Has a Story: An A to Z of Australian Geology*
(<https://www.publishing.csiro.au/book/8086>)
- *Rocks, Fossils and Formations: Discoveries Through Time*
(<https://www.publishing.csiro.au/book/7864>)

For adults:

- *Found a Fossil: Digs, Discoveries and Australia's Deep Past*
(<https://www.publishing.csiro.au/book/8203>)

Other CSIRO resources

CSIRO has developed and delivered a broad range of high-quality STEM education programs and initiatives for nearly 40 years. Our programs aim to inspire the pursuit of further STEM education among students and the community, to equip the emerging workforce with tomorrow's skill sets, and to strengthen collaboration between industry and classrooms across Australia. For more information visit: <https://www.csiro.au/en/Education>



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