

MEGAFAUNA

Megafauna

Primary Student Pack, Years 4-7

Educational outdoor activities for kids that invoke wonder and respect for our amazing natural landscape.



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Booking Your Megafauna Workshop

To book your Megafauna Workshop or request a copy of our Teacher Guide contact us on the details below:

P. +61 (8) 9755 2152

E. education@margaretriver.com

Overview

Aim:

This package is designed to be used in conjunction with the Megafauna Workshop at Lake and Mammoth Caves and to compliment the Australian National Curriculum for years 4 to 7. In this package and the accompanying workshop students will learn about megafauna species, the ancient environment they inhabited and the forces that drove them to extinction. The unit also covers the formation and discovery of fossils making note of the information fossils can reveal to scientists. Students will study the adaptations and characteristics of megafauna and compare them to modern extant Australian fauna.

By the completion of this education package and workshop students will:

- through their own investigations be able to identify a number of the megafauna species which existed on the Australian continent.
- understand the environmental factors that influence the survival and extinction of a species.
- be able to demonstrate the process by which fossils are formed.
- understand and compare modern palaeontological methods compared to the past.
- carry out scientific experiments to identify the way animal adaptations suit particular environments.
- identify the adaptations of extant Australian fauna and how they suit the Australian environment.
- compare the similarities between the extinction of megafauna and modern Australian species.
- consider the implications for future preservation of native Australian fauna.



Curriculum Links

Curriculum Framework Links

The following chart summarises key curriculum achievement standards covered by this unit of work. The resource materials and activities have been developed to achieve a range of outcomes and be relevant to the new ACARA - Australian Curriculum.

Australian Curriculum Assessment and Reporting Authority - The Australian Curriculum

Science	Humanities and Social Science	Mathematics	Cross Curriculum Priorities
<p>Science Understanding</p> <p><i>Biological sciences</i></p> <p>Living things have life cycles.</p> <p>Living things depend on each other and the environment to survive.</p> <p>Living things have structural features and adaptations that help them to survive in their environment.</p> <p><i>Earth and space sciences</i></p> <p>Earth's surface changes over time as a result of natural processes and human activity.</p>	<p>Geography</p> <p>The importance of environments, including natural vegetation, to animals and people.</p> <p>The influence of people, including Aboriginal and Torres Strait Islander Peoples, on the environmental characteristics of Australian places.</p> <p>The way people alter the environmental characteristics of Australian places (e.g. vegetation clearance, fencing, urban development, drainage, irrigation, farming, forest plantations, mining).</p>	<p>Data representation and interpretation</p> <p>Select and trial methods for data collection, including survey questions and recording sheets.</p> <p>Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values.</p>	<p>Sustainability</p> <p>The biosphere, including all life forms, relies on the interdependence of social, economic and ecological systems. We recognise that by valuing and actioning sustainable practices as individuals and communities we are preserving our environment for the future.</p> <p>Aboriginal and Torres Strait Islander histories and cultures</p> <p>The Wadandi people of the Southwest maintain a special relationship with the land, sea, sky and waterways. Their knowledge of the local area is extensive and they have lived in this area for tens of thousands of years. Their language and history are intrinsically linked to local flora, fauna and the landscape.</p>

Topic Web

Your Megafauna Workshop can be used as a springboard to explore a range of topics surrounding Australian megafauna and the cave environment. You might like to consider the following:



Teacher Notes on Megafauna

Here are a few points for teachers to know about megafauna before studying this topic...

1. Megafauna were large animals that went extinct during the Pleistocene era at approximately the same time that humans started to spread around the world. They were similar to many extant species but as a rule they were usually about 30% larger. There are of course still many large animals alive today, however the term megafauna, relates specifically to species (usually over 45 kilograms) that went extinct during the Pleistocene era. [Prehistoric Giants, the Megafauna of Australia. Clode D., 2009. Museum of Victoria]
2. Megafauna existed across the globe, and each continent had its own species. The woolly mammoth and sabre tooth tigers are some well-known examples from other continents. By the end of the Pleistocene, between 10 and 30 thousand years ago, most of these species disappeared. The only large species to survive were in Africa and the oceans, leaving us with elephants, hippopotamuses and blue whales. Australia did not have as many megafauna species as other regions possibly due to the poorer soils. Nonetheless, Australia's MF followed much the same rise and decline as those in other continents. [Prehistoric Giants, the Megafauna of Australia. Clode D., 2009. Museum of Victoria]
3. About 15 million years ago, rainfall steeply declined and the world moved toward an icehouse climatic phase - cycling through cooler dryer periods, interspersed with some warmer wet periods. The trend on the whole resulted in a dryer climate for Australia and culminated in the ice ages of the Pleistocene. Throughout the last 15 million years, most groups of animals, including reptiles and birds underwent 'gigantism', perhaps because large herbivores could eat more of the progressively poorer quality vegetation. This in turn meant that carnivores needed to be larger to keep pace with the herbivores. Following the Pleistocene, those lineages that survived, underwent dwarfing and declined in size by up to 30%. [Prehistoric Mammals of Australia and New Guinea: One Hundred Years of Evolution. Long, Archer, Flannery & Hand, 2002. University of New South Wales Press.]
4. In 1904 during the construction of a walkway in Mammoth Cave some rather large odd bones were uncovered. Mr Ludwig Glauert was seconded to the W.A. Museum; with the brief of Palaeontological Research in the entire South West. The results of less than two months of work was a collection of more than 2000 specimens, including a *Zygomaturus trilobus*, Tasmanian tiger, Tasmanian devil, koala, an extinct Western Australian wombat, the giant echidna, several forms of extinct kangaroos (one of which was at least twice the size of the grey kangaroo today) and many other forms.
5. The two main theories for the disappearance of megafauna include climate change and the spread of humans across the globe. The general consensus is that it could have been a combination of the two but most of the evidence points towards human interaction leading to extinction.

Megafauna Primary Program Years 4-7

Outcomes	Descriptions	Activities	Science Skills	Resources
<p>Living things have life cycles.</p> <p>Living things depend on each other and the environment to survive.</p>	<p>Making and recording observations of living things as they develop through their life cycles.</p>	<p>Read the introduction excerpt from PGTMOA.</p> <p>Use the First Impressions worksheets and in groups record the following about each animal in the story:</p> <ul style="list-style-type: none"> • Where does it live/shelter? • What does it eat? • Nocturnal/diurnal? • How does it hunt? • What type of animal is it? Mammal, reptile etc. • Any offspring? How many? • Any other facts from the story... 	<p>Identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge.</p>	<p>Text:</p> <p><i>Prehistoric Giants the Megafauna of Australia;</i> Cloates, D. 2009, Museum Victoria</p> <p><i>The Short Tragic Life of Leo the Marsupial Lion;</i> Long, J. 2009, Western Australian Museum</p> <p>Online:</p> <p>https://museumvictoria.com.au/melbournemuseum/discoverycentre/dinosaur-walk/videos/megafauna/</p> <p>Page 12 of the MF education package</p>
<p>Living things have life cycles.</p> <p>Living things depend on each other and the environment to survive.</p>	<p>Investigating the roles of living things in a habitat.</p> <p>Making and recording observations of living things as they develop through their life cycles.</p>	<p>As a class, use a KWL chart to identify students existing knowledge and to generate questions for further investigation.</p> <p>Questions you might like to consider:</p> <ul style="list-style-type: none"> • When did they exist? • How do we know they existed? • What did they look like? • Where did they live? • Were they like anything we have now? • Why did they go extinct? 	<p>Identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge.</p>	<p>Text:</p> <p><i>Prehistoric Giants the Megafauna of Australia;</i> Cloates, D. 2009, Museum Victoria</p> <p><i>The Short Tragic Life of Leo the Marsupial Lion;</i> Long, J. 2009, Western Australian Museum</p> <p>Online:</p> <p>https://museumvictoria.com.au/melbournemuseum/discoverycentre/dinosaur-walk/videos/megafauna/</p> <p>Page 13 of the MF education package</p>

Megafauna Primary Program Years 4-7

Outcomes	Descriptions	Activities	Science Skills	Resources
<p>Living things have life cycles.</p> <p>Living things depend on each other and the environment to survive.</p>	<p>Investigating the roles of living things in a habitat.</p>	<p>Students create a set of Megafauna Profile sheets on a selection of Australian Megafauna species; Thylacoleo, Zygomaturus, Wonambi, Zaglossus, Thylacine, Simosthenurus, Diprotodon and Megalania.</p> <p>Play Cenozoic Celebrity Heads using the megafauna profile sheets for content.</p> <p>Students can create a clay diorama with explanatory notes as found in a museum or make a poster with pictures.</p>	<p>Plan and conduct scientific investigations.</p> <p>Use a range of methods to represent data and identify patterns.</p> <p>Reflect on investigations.</p>	<p>Text:</p> <p><i>Prehistoric Giants the Megafauna of Australia;</i> Cloates, D. 2009, Museum Victoria</p> <p><i>The Short Tragic Life of Leo the Marsupial Lion;</i> Long, J. 2009, Western Australian Museum</p> <p>Online:</p> <p>https://museumvictoria.com.au</p> <p>http://www.abc.net.au/science/ozfossil/megafauna/default.htm</p> <p>Page 14-15 of the MF education package</p>
<p>Living things depend on each other and the environment to survive.</p> <p>Earth's surface changes over time as a result of natural processes and human activity.</p>	<p>Recognising that environmental factors can affect life cycles.</p> <p>Predicting the effects when living things in feeding relationships are removed or die out in an area.</p>	<p>Students explore the reasons for the disappearance of Australian Megafauna including changes in climate and vegetation, as well as predation from humans.</p> <p>Play Australian Survivor to explore the environmental factors affecting animals that may lead to extinction over a period of time.</p> <p>Use the resources attached to reflect on activities.</p>	<p>Plan and conduct scientific investigations.</p> <p>Use a range of methods to represent data and identify patterns.</p> <p>Reflect on investigations.</p>	<p>Text:</p> <p><i>Prehistoric Giants the Megafauna of Australia;</i> Cloates, D. 2009, Museum Victoria</p> <p><i>The Short Tragic Life of Leo the Marsupial Lion;</i> Long, J. 2009, Western Australian Museum</p> <p>Online:</p> <p>http://www.abc.net.au/science/features/megafauna/</p> <p>http://www.abc.net.au/science/ozfossil/megafauna/default.htm</p> <p>http://studyjams.scholastic.com/studyjams/jams/science/index.htm</p> <p>Page 16-23 of the MF education package</p>

Megafauna Primary Program Years 4-7

Outcomes	Descriptions	Activities	Science Skills	Resources
<p>Living things have life cycles.</p> <p>Earth's surface changes over time as a result of natural processes and human activity.</p>	<p>Investigating the roles of living things in a habitat.</p>	<p>Students investigate how fossils are formed and create a storyboard showing the process.</p> <p>They identify the different types of fossils including mould, cast, trace and true fossils.</p> <p>Students make their own fossils using the Fossil Farming instruction sheet.</p> <p>Students investigate one of the major palaeontological sites in Australia.</p>	<p>Plan and conduct scientific investigations.</p> <p>Represent and communicate observations, ideas and findings using formal and informal representations.</p>	<p>Text:</p> <p><i>Prehistoric Giants the Megafauna of Australia;</i> Cloates, D. 2009, Museum Victoria</p> <p><i>Curious about fossils;</i> Water, K, 2016, Grosset and Dunlap, New York</p> <p><i>The Short Tragic Life of Leo the Marsupial Lion;</i> Long, J. 2009, Western Australian Museum</p> <p>Online:</p> <p>http://www.slideshare.net/mlindsay1/fossils-ppt</p> <p>http://fadlmedia.s3.amazonaws.com/ntah/clips/naracoote_bb.mp4</p> <p>http://www.australia.gov.au/about-australia/australian-story/australias-fossil-past</p> <p>Page 24 of the MF education package</p>
<p>Living things have life cycles.</p> <p>Living things depend on each other and the environment to survive.</p> <p>Earth's surface changes over time as a result of natural processes and human activity.</p>	<p>Investigating the roles of living things in a habitat.</p>	<p>Students select a way to present their information to the class. They must demonstrate they have answered all the questions generated in the KWL activity.</p> <p>Information may be presented as a talk, report, poster, panel discussion or PowerPoint presentation etc.</p>	<p>Reflect on investigations.</p> <p>Represent and communicate observations, ideas and findings using formal and informal representations.</p>	<p>Page 13 of the MF education package</p>

Megafauna Primary Program Years 4-7

Outcomes	Descriptions	Activities	Science Skills	Resources
<p>Living things have structural features and adaptations that help them to survive in their environment.</p> <p>Earth's surface changes over time as a result of natural processes and human activity.</p>	<p>Explaining how particular adaptations help survival.</p>	<p>Students explore adaptations, both structural and behavioural.</p> <p>Use the Megafauna Fortune Teller to explore how animals suit their environment. Identify what adaptations assist in their survival.</p> <p>Investigate specific structural adaptations. Through conducting the Matchstick Camouflage Experiment and Canned Heat Experiment - students study how colour adaptations can assist with survival.</p>	<p>Plan and conduct scientific investigations.</p> <p>Use a range of methods to represent data and identify patterns.</p> <p>Reflect on investigations.</p>	<p>Online:</p> <p>Online video about adaptations; http://studyjams.scholastic.com/studyjams/jams/science/animals/animal-adaptations.htm</p> <p>Page 25-28 of the MF education package</p>
<p>Living things have structural features and adaptations that help them to survive in their environment.</p>	<p>Explaining how particular adaptations help survival.</p> <p>Describing and listing adaptations of living things suited for particular Australian environments.</p>	<p>Students investigate behavioural adaptations;</p> <p>Use the Clever Kangaroo page. Read the text and make a chart detailing the adaptation, if it's behavioural or structural and how it assists in the species survival.</p> <p>Create a poster detailing the structural and behavioural traits in common Australian fauna and explain how they assist with survival in a particular environment.</p>	<p>Plan and conduct scientific investigations.</p> <p>Use a range of methods to represent data and identify patterns.</p> <p>Reflect on investigations.</p>	<p>Text:</p> <p><i>Amazing Animals of Australia's National Parks</i>; Newton, Gina M. 2016, National Library of Australia</p> <p>Online:</p> <p>http://studyjams.scholastic.com/studyjams/jams/science/animals/animal-adaptations.htm</p> <p>http://www.australiangeographic.com.au/topics/wildlife/2016/02/top-10-amazing-animal-adaptations/top-10-amazing-animal-adaptations-echidna-hind-legs</p> <p>Page 29 of the MF education package</p>

Megafauna Primary Program Years 4-7

Outcomes	Descriptions	Activities	Science Skills	Resources
Living things have structural features and adaptations that help them to survive in their environment.	Explaining how particular adaptations help survival. Describing and listing adaptations of living things suited for particular Australian environments.	Design an animal. Either use Switch Zoo in the online resource list to assist or create your own using the <i>Megamadeupafauna</i> worksheet in the education package. Choose a habitat and diet. Create an animal, identify its structural and behavioural adaptations and how they assist in its survival. Discuss how this same process can be used backwards when we look at fossils to make guesses about what kind of environment an animal lived in.	Living things have structural features and adaptations that help them to survive in their environment.	Online: http://switchzoo.com Page 30 of the MF education package
Living things have structural features and adaptations that help them to survive in their environment. Earth's surface changes over time as a result of natural processes and human activity.	Explaining how particular adaptations help survival. Describing and listing adaptations of living things suited for particular Australian environments.	Students investigate the theories for the extinction of MF. What are the main two theories? Students investigate the reasons for extinction of fauna in modern Australia. What are the main reasons? Make comparisons and identify similarities between the extinction of MF and Australian species in modern times. What can we do to help prevent further extinctions of Australian fauna?	Identify questions in familiar contexts and make predictions based on prior knowledge. Present data and identify patterns. Reflect on investigations.	Text: <i>Prehistoric Giants the Megafauna of Australia;</i> Cloates, D. 2009, Museum Victoria <i>Prehistoric Mammals, McNamara;</i> K., Murray, P. 2010, Western Australian Museum <i>The Short Tragic Life of Leo the Marsupial Lion;</i> Long, J. 2009, Western Australian Museum Online: http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fauna

First Impressions, Mega+Fauna=

Megafauna refers to a number of large animals, usually over 45 kilograms that went extinct by the end of the Pleistocene era, about 10,000 years ago. The most commonly known megafauna are the famous woolly mammoth and sabre tooth tigers made popular in the animated movie Ice Age. These particular animals lived in the American continents and north into Siberia. Australia however, had its own megafauna species and like those from other continents they seemed to follow a similar pattern of extinction coinciding with the spread of humans across the world. Evidence from megafauna sites across Australia indicates their extinction occurred approximately 45,000 years ago.

1. Read the excerpt from the Prehistoric Giants, the Megafauna of Australia twice. The first time just listen and use your imagination, the second time record what you can about the animals and the environment in the story. You may like to divide into groups and each focus on a particular element. Consider the following when recording your details;

- physical description
- where does it live?
- what does it eat?
- is it nocturnal or diurnal?
- how does it hunt?
- what type of animal is it?
- how does it carry its young?
- any other points you think are important or help describe the animal?

<i>Thylacoleo carnifex</i>	<i>Diprotodon optatum</i>
<i>Megalania prisca</i>	<p>Environment What time of day?</p> <p>Vegetation?</p> <p>Landscape features?</p> <p>Other fauna?</p>

KWL Chart

Topic of Investigation

Know	Want to Know	Learned

Megafauna Profile

Common Name:

Scientific Name:

Classification: Mammal Reptile Bird

Diet: Herbivore Carnivore

Habitat:

Body Covering: Fur Feathers Scales

Existing species it is similar to:

Interesting fact:

What did it look like?

Common Name:

Scientific Name:

Classification: Mammal Reptile Bird

Diet: Herbivore Carnivore

Habitat:

Body Covering: Fur Feathers Scales

Existing species it is similar to:

Interesting fact:

What did it look like?

Cenozoic Celebrity Heads

What you need

- **Headbands**
- **Cardboard squares (size of business cards)**
- **Sticky tape or blu tack**
- **Texta**

How to play

Before the game begins, ask all students to write the name of a megafauna species on a cardboard square and place it in a container.

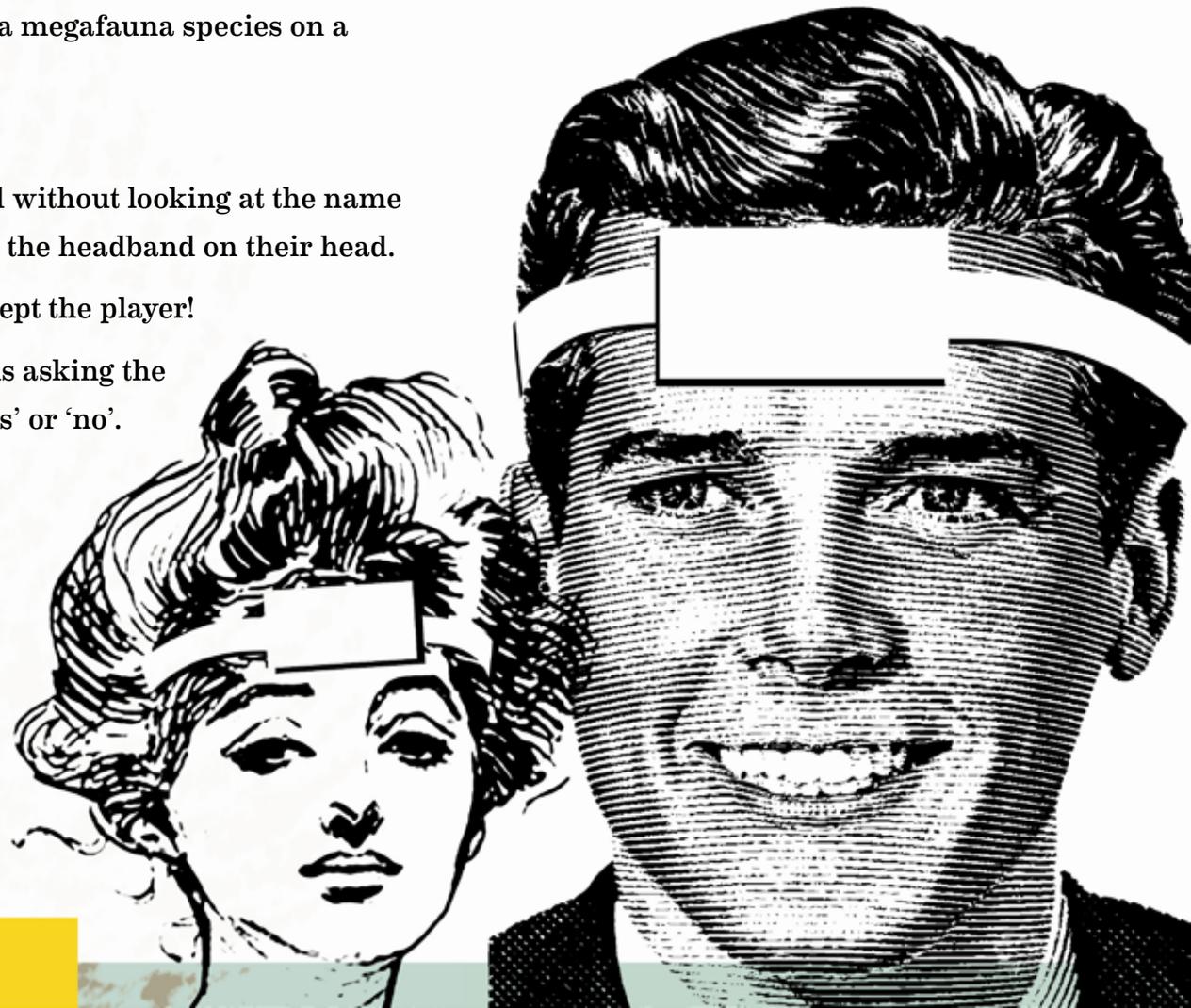
Choose 3 or 4 players to sit up the front of the class.

Each player pulls out of the container a cardboard square and without looking at the name attaches the cardboard to the headband using tape and places the headband on their head.

Now everyone knows the identity of the players' species – except the player!

To find out the name on the headband, each player takes turns asking the class questions about their animal. Answers can only be a 'yes' or 'no'.

To win the game, a player must be the first to guess the identity of the species.



Australian Survivor

Purpose of activity:

Students will explore how environmental factors influence the survival of a species and how the same environmental events can have positive or negative effects.

You will need:

- 1 x Game Piece
- 20 x each Australian Megafauna Cards
- 2 copies of each Environment Card
- Game Sheet
- Event Record Sheet (see example)
- Dice
- Reflection Sheet (see page 23)

Event	Plus/Minus	Total Population
		20

Sample Event Record Sheet

How to run activity:

Students choose a species and start with 20 of the Australian Megafauna Cards of that animal. They must try to finish the game before they run out of cards and go extinct.

Roll the dice, move the Game Piece on the board. Follow the instructions on the board. Next player to the left takes a turn. If they land on the Environment Card, draw the top card, follow the directions and place the card on the bottom of the pile.

Students must keep an events record sheet to record what happens to their species at each turn.

Follow up with the written questions on the Australian Survivor reflection page.

Cut out the Game Pieces below following the dotted line.





Favourable weather has increased food. All your species offspring survived the year.

PLUS 2



Humans are in your territory. They have successfully hunted 2 of your young.

MINUS 2



A tornado has swept through the habitat of your species and killed 3 members.

MINUS 3



A new species reached your territory and is competing for your food. 2 members have died.

MINUS 2



Favourable weather has increased food. All your species offspring survived the year.

PLUS 2



Humans are in your territory. They have successfully hunted 2 of your young.

MINUS 2



A tornado has swept through the habitat of your species and killed 3 members.

MINUS 3



A new species reached your territory and is competing for your food. 2 members have died.

MINUS 2



Volcanic dust has reduced sunshine and caused a food shortage. 2 members died.

MINUS 2



Early rains have saved dwindling food supplies. Your population has increased by 2 members.

PLUS 2



Fires have cleared land allowing ground vegetation to grow for food. Add 2 members.

PLUS 2



Massive fires caused by lightning have killed 2 members.

MINUS 2



Volcanic dust has reduced sunshine and caused a food shortage. 2 members died.

MINUS 2



Early rains have saved dwindling food supplies. Your population has increased by 2 members.

PLUS 2



Fires have cleared land allowing ground vegetation to grow for food. Add 2 members.

PLUS 2



Massive fires caused by lightning have killed 2 members.

MINUS 2



Drier climate has reduced forests. 2 members have died from lack of shelter.

MINUS 2



Change in climate has reduced food for other species. They lose 3 members.

3 FROM OTHERS



Harsh winter weather has killed 4 members of your species.

MINUS 4



You find another group of your species and merge with them to add 3 members.

PLUS 3



Drier climate has reduced forests. 2 members have died from lack of shelter.

MINUS 2



Change in climate has reduced food for other species. They lose 3 members.

3 FROM OTHERS



Harsh winter weather has killed 4 members of your species.

MINUS 4



You find another group of your species and merge with them to add 3 members.

PLUS 3



Australian Survivor - Reflection Sheet

Answer the following questions on a separate sheet of paper.

- 1. Do you feel it was just luck that helped your animal survive or did you have a plan? Is this similar to the real world?**
- 2. How could the same environmental event have a positive or a negative effect on your species? Give an example from the game.**
- 3. Can you think of another example of an environmental event that could have both a positive or negative effect?**
- 4. Choose one environmental factor that harmed your species. What feature/characteristic could your animal have had that may have helped it survive?**
- 5. Which of these short paragraphs do you think most represents how the survival of an animal is affected by its environment?**

Animals rely on the environment to provide certain needs, such as water, food, shelter, clean air and sunshine. When big changes occur in the environment sometimes these needs are not met and it makes it difficult for an animal to survive. Animals must adapt to suit the new environment or they will perish.

or

The natural environment is a delicate balance. The more water, food and shelter there is available, the larger the number of animals that can survive in an area. Animals are always competing with each other for these resources. When new animals move to an area, they may disrupt the balance and make it difficult for other species.

or

An animal's environment, includes all the other animals, the landscape and the climate in a particular location. When there are sudden changes in the environment, or changes that occur over a long time, it may become difficult for a species to find food, water and shelter. If that species is unable to adapt to these new conditions, it may become extinct.

- 7. Write your own paragraph summarising the relationship between an animal and its environment.**

Fossil Farming

How to make your own fossils.

Cast Fossil

Materials Needed

- Paper bowl or small container
- Modelling clay
- Green leaf, shell, nuts, bones or other material to make an imprint
- vegetable oil (optional)
- Plaster of Paris
- Water
- Mixing bowl
- Stirrer
- Cloth for clean up

Procedure

1. Knead modelling clay and flatten it across the bottom of the paper bowl about 1-2cm thick.
2. Press your fossil object half way into the clay.
3. Remove the object, leaving a clean imprint in the clay (you may brush some vegetable oil on the object first to prevent it sticking in the clay).
4. Mix the Plaster of Paris and water as per the directions on the packet, usually 2 to 1.
5. Pour the Plaster of Paris over the top of your imprint to a depth of about 2cm.
6. Let it dry for 24 hours.
7. Carefully remove clay and plaster from the paper bowl and peel back the clay revealing your fossil cast.
8. You may like to paint your fossil with paint or a coffee solution to make it look aged.

Mold Fossil

Materials Needed

- Paper bowl or small container
- Green leaf, shell, nuts, bones or other material to make an imprint
- vegetable oil or petroleum jelly
- Plaster of Paris
- Mixing bowl
- Water
- Stirrer
- Cloth for clean up

Procedure

1. Mix the Plaster of Paris and water as per the directions on the packet, usually 2 to 1.
2. Pour the plaster into your bowl.
3. Coat your fossil object in oil or jelly and press it into the plaster about half way.
4. Let it dry for 24 hours.
5. Carefully remove your fossil object from the plaster and remove plaster from bowl.
6. You may like to paint your fossil with paint or a coffee solution to make it look aged.

Extension activities

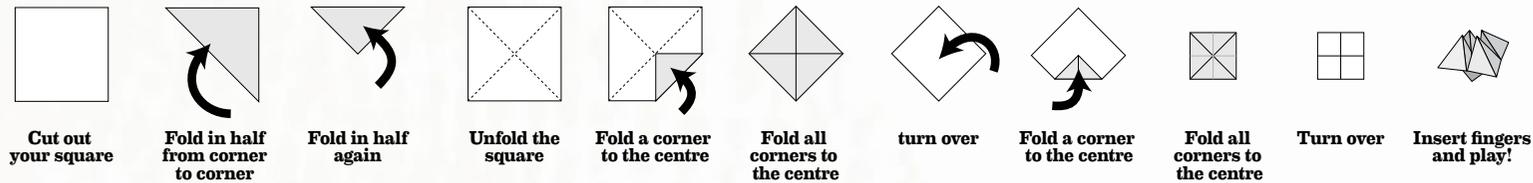
- Discuss the types of objects you have used in your fossils. What could these objects tell future palaeontologists about our present day environment?
- Research what are the different types of fossils?



Megafauna Fortune Teller

Directions.

1. Cut out the 3 origami fortune squares (this page and the next page) and fold them using the following steps:



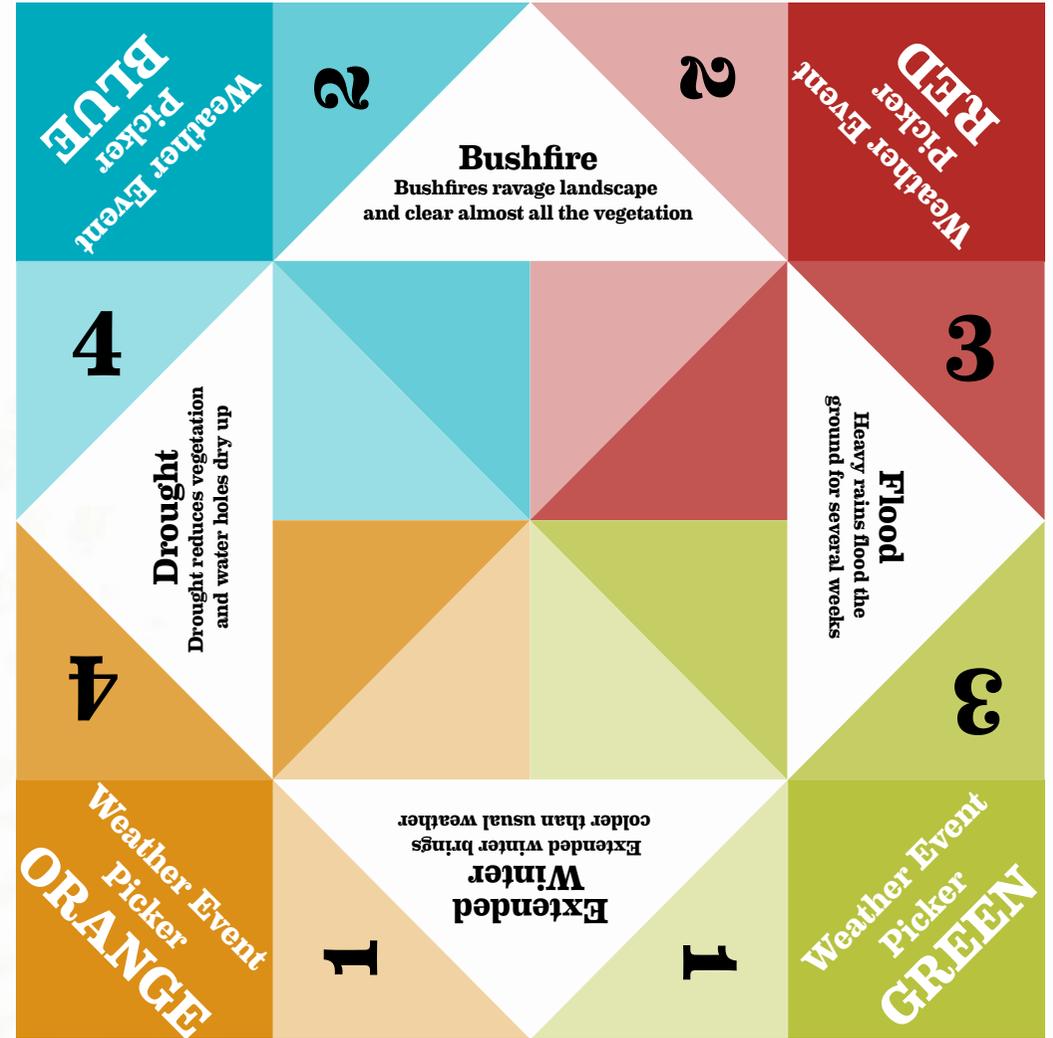
3. Create a data sheet with 3 columns and the following headings:

Species, Environment and Weather Event.

2. Use the Species Fortune Teller to see what animal species you are.
3. Use the Environment Fortune Teller and rate the species chance of survival from 1 to 5 in that environment. (5 being the highest chance). Record your selections on the data sheet.
4. Use the Weather Event Fortune Teller and explain how this event might change the species chance of survival. Record your selections on the data sheet.



Megafauna Fortune Teller



Matchstick Camouflage Experiment

Materials Needed:

- Box of coloured matchsticks
- A patch of green grass
- A timer or a watch with a second hand
- A person to keep time
- A data recording sheet

Directions:

Each player needs 10 matchsticks of each colour. If you have red, blue, yellow and green matchsticks, each player should receive 40 matchsticks in total.

Take your coloured sticks to a patch of green grass. Mix up the matchsticks and drop them in the grass. Try to distribute them evenly.

Set the timer, or have someone watch the time, for one minute.

Players pick up as many matchsticks as they can before the time is up. At the end of one minute, sort by colour the matchsticks that you picked up. Count how many of each colour you found.

Create a record sheet to record your data. Present your data in a graph form.

Now answer the following questions:

- 1. Which colour matchsticks were the easiest to find?**
- 2. Which colour matchsticks were the most difficult to find?**
- 3. Why do you think this is so?**
- 4. Can you see why it's good for an animal to be the same colour as its surroundings?**

Repeat activity in different settings. Either in the sand pit or on red pea gravel.

Have students make a hypothesis about the results they expect from different settings.



Canned Heat Experiment

This experiment looks at the effects of colour on temperature.

Materials Needed:

- Three cans or jars per group, all containers must be the same size
- Black, White and Red strips of paper or a selection of colours, ranging from light to dark
- Clingwrap
- Rubber Band or Sticky Tape
- Thermometer
- A data recording sheet (see example)

Directions:

Use different coloured papers to wrap around 3 containers. Cover cans with clingwrap and seal with rubber band or sticky tape.

Place the cans in the direct sunlight for 4-5 hours.

Move containers out of the sun and measure the temperature of the water in each container. Record results on a data sheet.

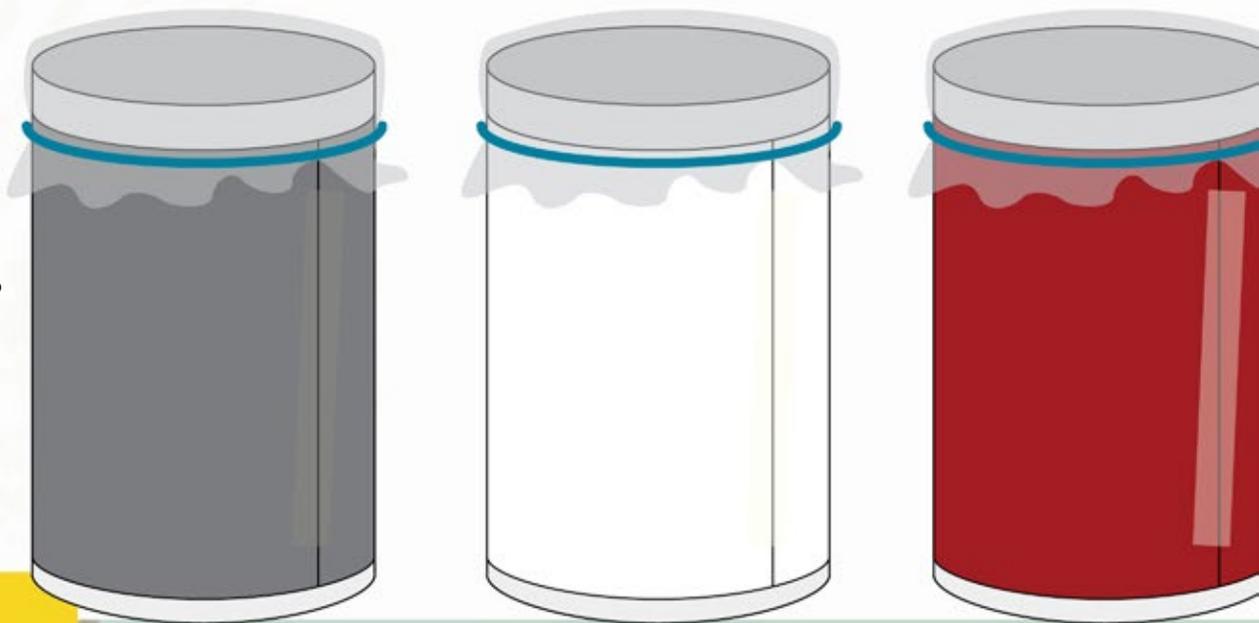
Now answer the following questions:

1. Which colour container had the coolest water?
2. Which colour had the warmest water?
3. Why do you think this is so?
4. What is the definition of “adaptation”?
5. How would colour adaptation assist an animal to survive?



Container Colour			
Temperature after ___ Hours			

Sample Data Record Sheet



Clever Kangaroos

1. Research the definitions of behavioural and structural adaptations.

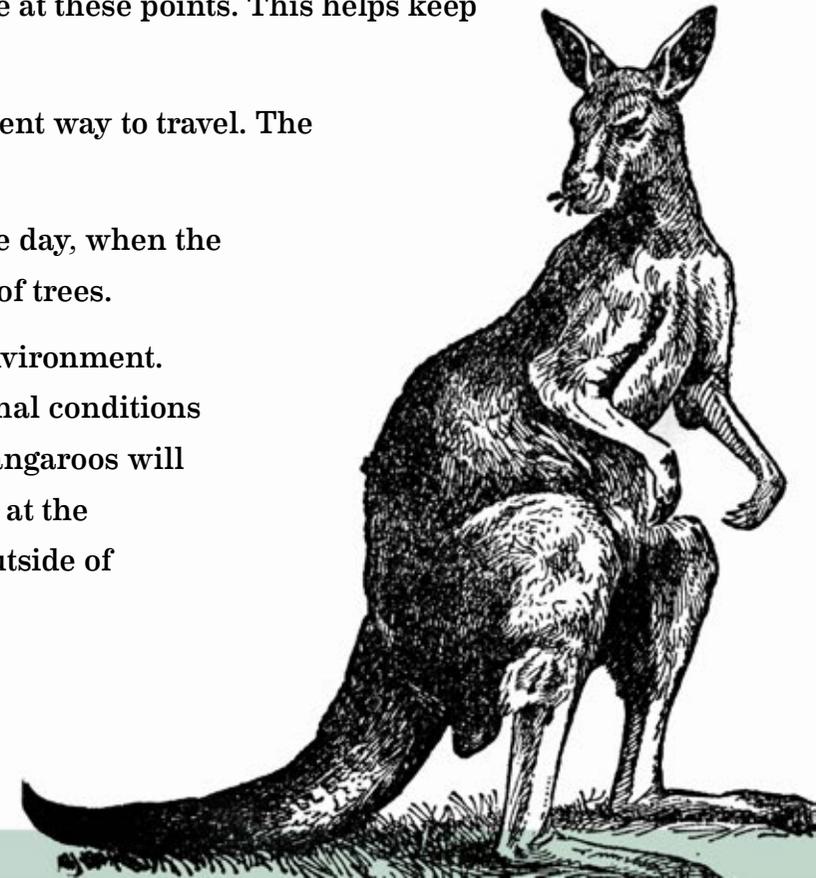
2. Read the text and make a chart detailing the adaptation, if it's behavioural/structural and how it assists in the species' survival.

Kangaroos are found in many different regions of Australia, including the desert and semi-arid regions. Kangaroos from these areas have behavioural and structural adaptations that enable them to survive the harsh conditions.

Kangaroos from desert and semi-arid environments have adapted to drier conditions and have several features that help them deal with the lack of water.

- Kangaroos need very little water to survive. The intestine of the red kangaroo reabsorbs water as it passes through which means the kangaroo produces very dry faeces and the little water they have available to them is put to good use by being recycled by their body.
- When they are hot, kangaroos pant to cool down. They also lick their chests and the inside of their forearms until those areas are quite wet. When the moisture evaporates it cools the blood, which circulates close to the surface at these points. This helps keep the animal cool.
- Kangaroos hop over large distances to find food and water. Hopping is a fast, energy efficient way to travel. The kangaroo can cover large distances without using a lot of energy.
- Kangaroos are mostly active in the early morning or evening, when it is cooler. During the day, when the temperature is most extreme, kangaroos spend their time lazing around under the shade of trees.
- The female kangaroo's efficient breeding cycle also assists them in surviving the harsh environment. They have the ability, when pregnant, to put the growth of the embryo on hold until external conditions improve. This increases the chances of the young surviving. In times of drought, many kangaroos will die but when conditions are good female kangaroos can have three young ones with them at the same time: one as an embryo (not yet born), one in the pouch attached to a teat and one outside of the pouch but still drinking the mother's milk.

Source: Science Web Australia, Australian Science Teachers Association



Megamadeupafauna

Here is a chance to design your own species! First however, you must identify the following:

Where does your animal live? What are the features of that environment? (rainfall, temperature, soil type, vegetation, geology, predators, hunting, water sources)

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What does your animal eat?

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What are its structural adaptations?

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What are its behavioural adaptations?

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.....

How do these assist with its survival within its habitat?

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.....

Draw a picture of your animal

