

Explore how biodiversity is achieved through reproduction and heredity. Using a range of Australian animals as case studies, investigate a variety of reproductive methods and the influence of environmental factors on reproductive success and inheritance patterns. Learn how Taronga's use of contemporary genetic research and reproductive technologies are helping ensure the conservation of many iconic species.



OUTCOMES

Knowledge and Understanding:

- BIO12-12 A student explains the structures of DNA and analyses the mechanisms of inheritance and how processes of reproduction ensure continuity of species
- BIO12-13 A student explains natural genetic change and the use of genetic technologies to induce genetic change

Working Scientifically:

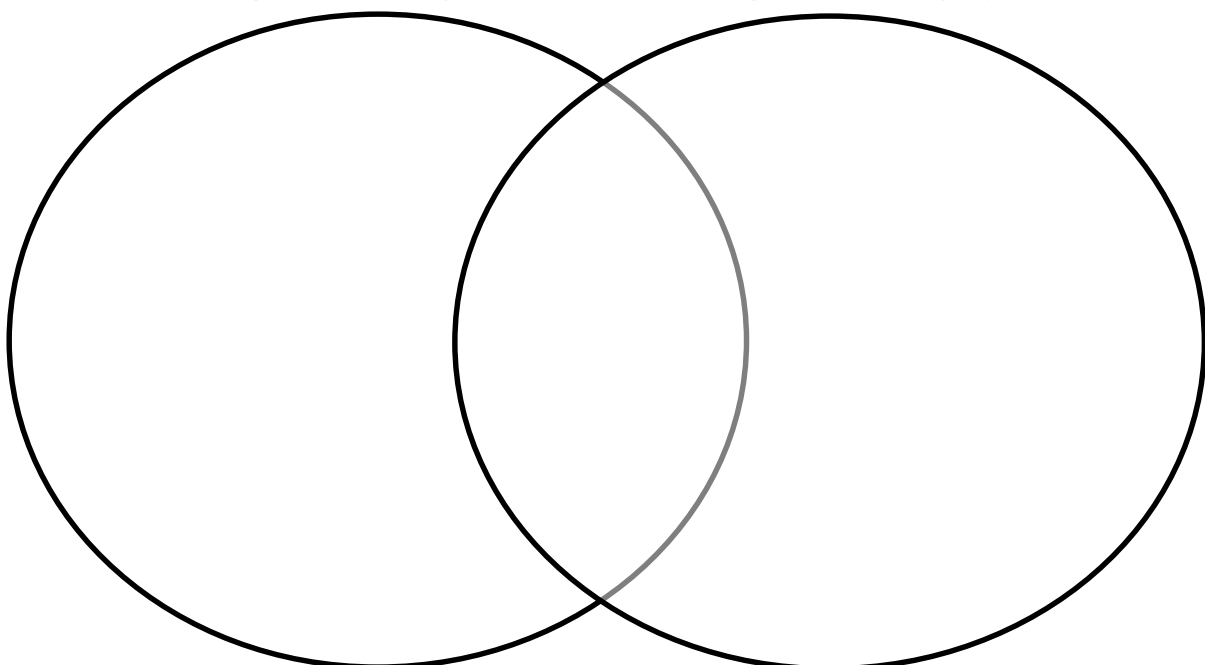
- BIO11/12-5 analyses and evaluates primary and secondary data and information
- BIO11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose

Inquiry Question - How does reproduction ensure the continuity of a species?

Content Descriptor – Explain the mechanisms of reproduction that ensure the continuity of a species, by analysing sexual and asexual methods of reproduction in a variety of organisms, including but not limited to: - animals: advantages of external and internal fertilisation.

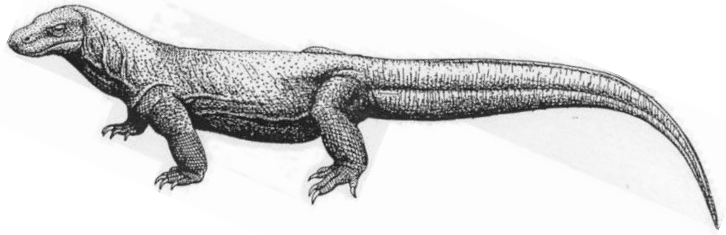
SEXUAL REPRODUCTION

ASEXUAL REPRODUCTION



YEAR 12 BIOLOGY - HEREDITY AND GENETIC CHANGE

Student Worksheet

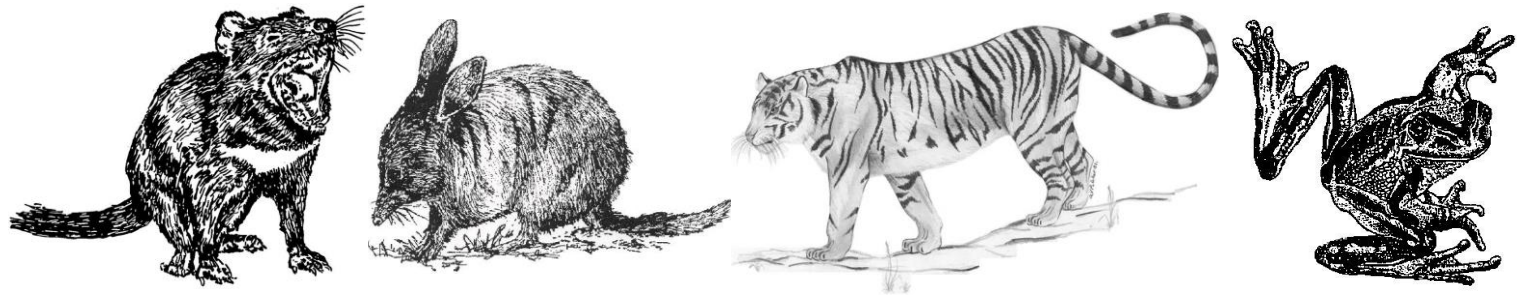


What do these animals have in common?

	External Reproduction	Internal Reproduction
Species		
Environments		
Advantages		
Disadvantage		

YEAR 12 BIOLOGY - HEREDITY AND GENETIC CHANGE

Student Worksheet

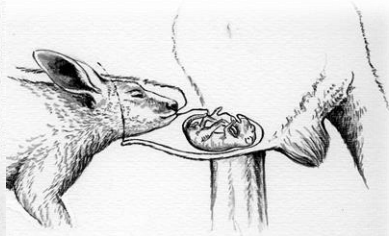
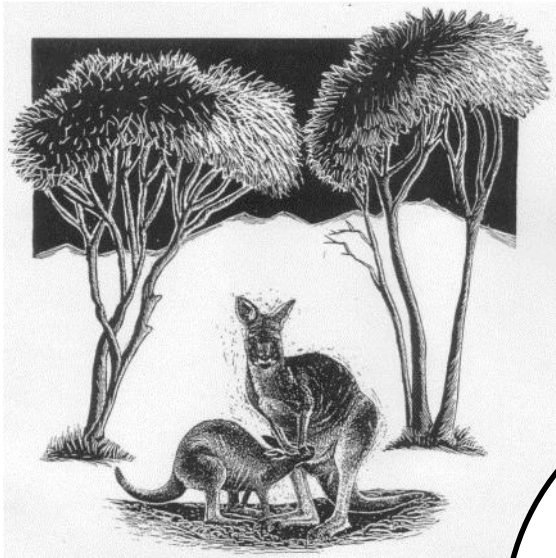


Using information from your educator led workshop, exhibits around the Zoo and the Taronga website www.Taronga.org.au, complete the table below for four species of your choice.

TARONGA'S BREEDING PROGRAMS		
Species	Reproductive Method	Breeding Program Details

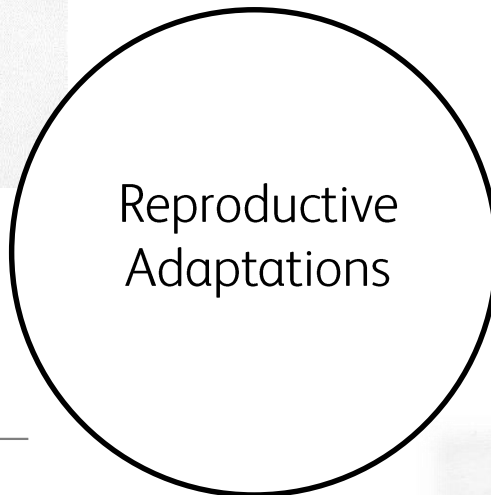
Inquiry Question: How does reproduction ensure the continuity of a species?

Content Descriptor- analyse the features of fertilisation, implantation and hormonal control of pregnancy and birth in mammals.

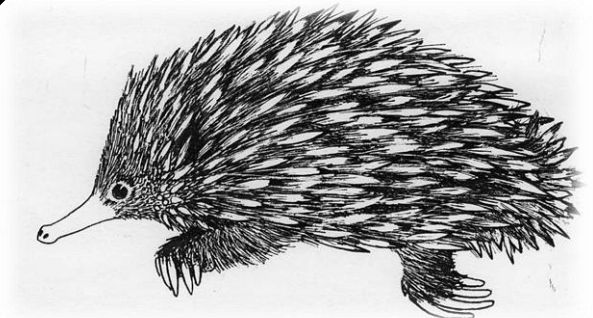


Red Kangaroo

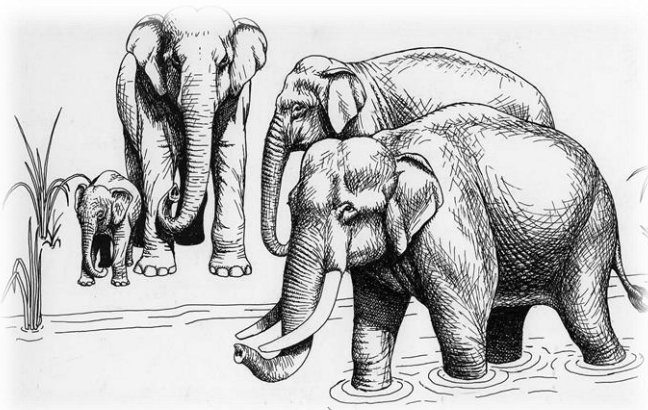
Asian Elephant



Reproductive
Adaptations

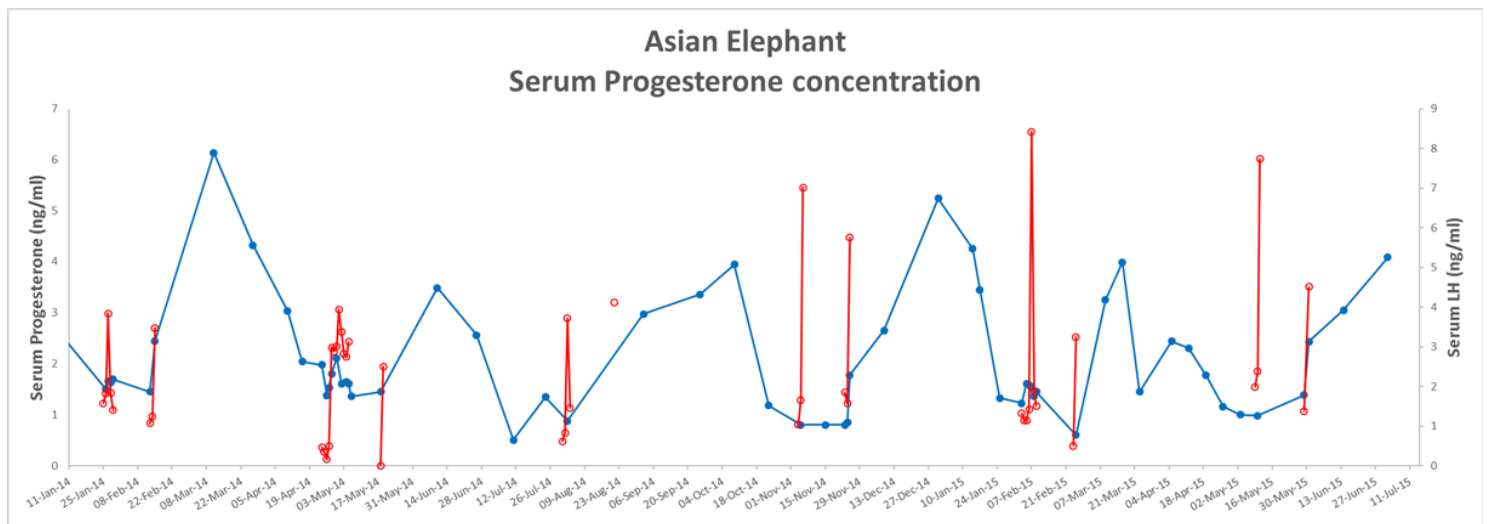


Short Beaked Echidna



Unique Female Reproductive Cycle

Working Scientifically BIO12-5 - analyses and evaluates primary and secondary data and information



Peak type	Date	Days oLH-oLH
aLH	27-Jan-14	
oLH	15-Feb-14	-
aLH	01-May-14	
oLH	19-May-14	93
aLH	02-Aug-14	
oLH	21-Aug-14	
aLH	06-Nov-14	
oLH	25-Nov-14	
aLH	07-Feb-15	
oLH	25-Feb-15	
aLH	11-May-15	
oLH	31-May-15	

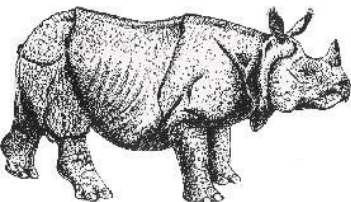
- Label the Luteal phase, Follicular phase, aLH peak and oLH peak on the graph above.
- The cycle length of a female elephant is calculated from the interval (in days) between each oLH (ovulatory Luteinizing Hormone) peak. Determine the number of days between each oLH peak and record in the table to the left.
- Determine the average cycle length of this female elephant.

- On what date is she most likely to ovulate next?

Inquiry Question - Does artificial manipulation of DNA have the potential to change populations forever?

Content Descriptor - compare the processes and outcomes of reproductive technologies, including but not limited to: - artificial insemination

ARTIFICIAL INSEMINATION

Advantages	Disadvantages
	

Inquiry Question - can population genetic patterns be predicted with any accuracy?

Content descriptor - investigate the use of technologies to determine inheritance patterns in a population

ZIMS

List the features of the species 360: ZIMS program

Inquiry Question - can population genetic patterns be predicted with any accuracy?

Content descriptor - investigate the use of data analysis from a large-scale collaborative project to identify trends, patterns and relationships, for example:
- the use of population genetics data in conservation management



Case Study: Little Penguins

BACK AT SCHOOL

Inquiry Question - how do genetic techniques affect Earth's biodiversity?

Working Scientifically BIO12-7 - communicates scientific understanding using suitable language and terminology for a specific audience or purpose

Using case studies from the Zoo, analyse the social implications and ethical uses of artificial insemination. Include the potential impacts on biodiversity.