

# HEREDITY AND GENETIC CHANGE

## Year 12 Biology

Stage: 6

Outcomes: BIO12-12 A, BIO-13 A, BIO 11/12-5, BIO 11/12-7



How does reproduction ensure the continuity of a species? Does artificial manipulation of DNA have the potential to change populations forever? In this workshop, students will explore how biodiversity is achieved through reproduction and heredity. Using a range of Australian animals as case studies, students will investigate a variety of reproductive technologies that Taronga Zoo utilises to ensure successful breeding and inheritance patterns.



TARONGA  
ZOO  
SYDNEY



TARONGA  
WESTERN PLAINS  
ZOO  
DUBBO

*For the Wild*

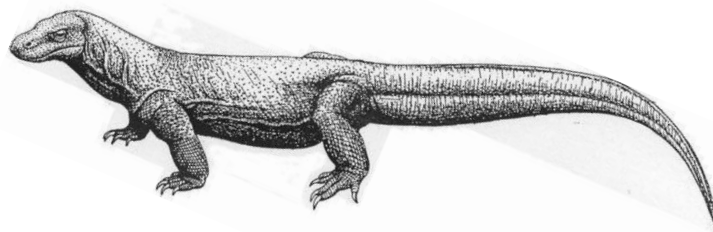
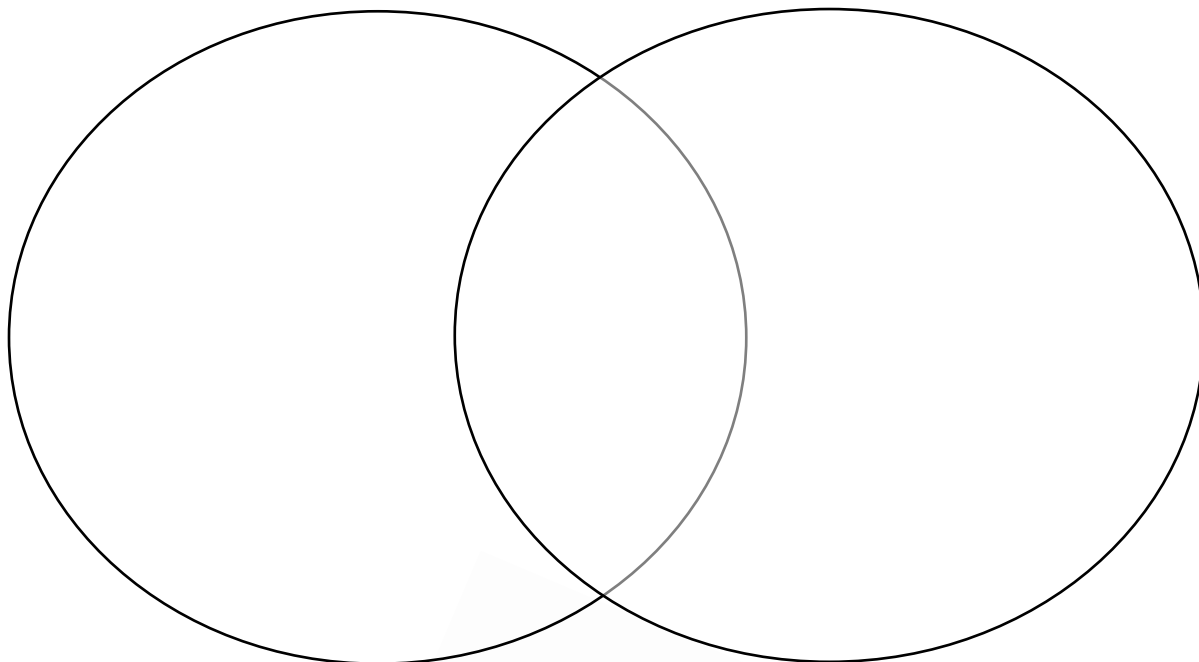
# INQUIRY QUESTION

*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**



What do these animals have in common?



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# INQUIRY QUESTION

*How does reproduction ensure the continuity of a species?*

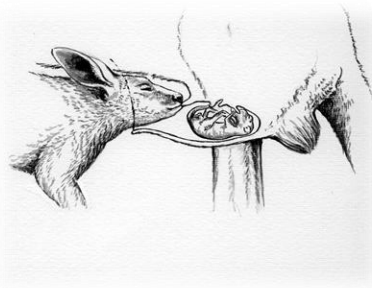
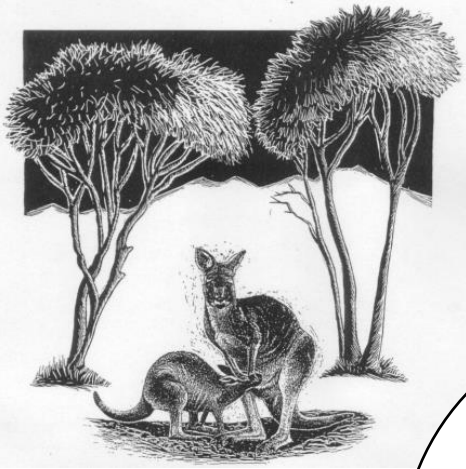


	External Reproduction	Internal Reproduction
Species		
Environments		
Advantages		
Disadvantages		

# 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

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Asian Elephant

Reproductive Adaptations

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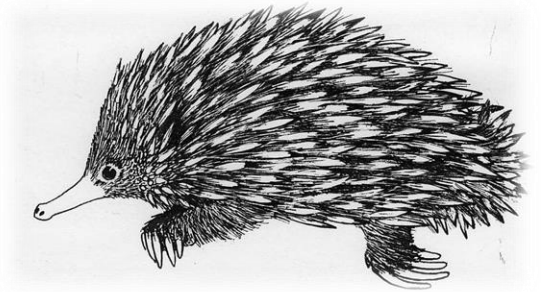
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Short Beaked Echidna

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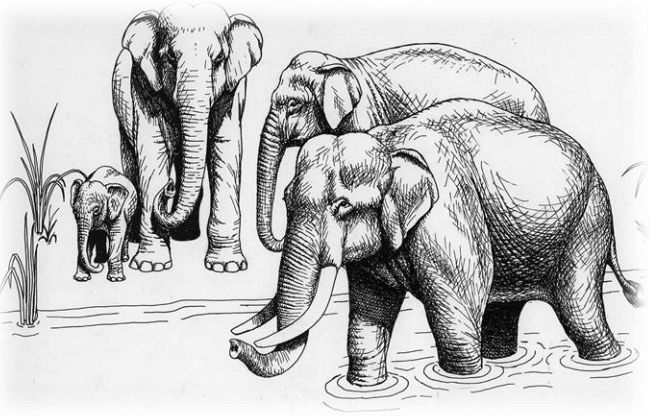
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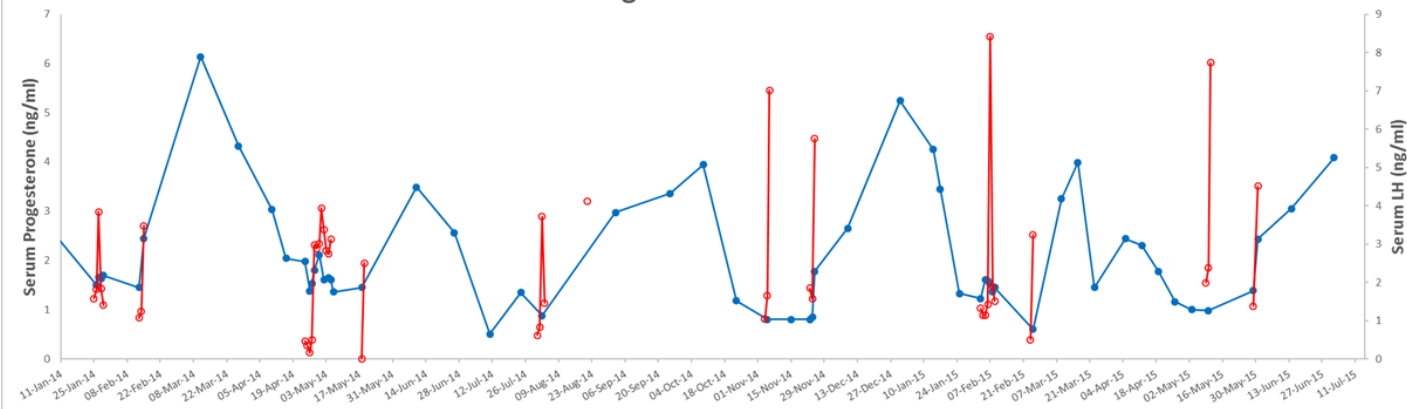
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# UNIQUE FEMALE REPRODUCTIVE CYCLE

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

Asian Elephant  
Serum Progesterone concentration



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	

1. Label the Luteal phase, Follicular phase, aLH peak and oLH peak on the graph above.
2. 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.
3. Determine the average cycle length of this female elephant.
4. 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

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## 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.