



# AMAZING ANATOMIES WORKSHEET

## Discover how animals 'poo, eat, breathe and mate'?!

In small groups (with an adult), complete the worksheet. We recommend staggered groups to minimise congestion if multiple classes. Read the exhibit signage as well as the worksheet to discover the answers. Worksheet sections/locations can be completed in any order. Come back to a question if you can't answer it right away as you might find it on a sign later.

Please note that Kindergarten-Year 8 students must be with a supervising adult for the duration of their visit to Currumbin Wildlife Sanctuary. This includes riding the train.

### Blinky Bill's Home Tree

(Freshwater animals, nocturnal mammals and reptiles map reference B14) –

1.

a) Find an animal that can survive in stagnant ponds with low oxygen.

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b) What is special about the way this particular fish breathes? How do most fish breathe?

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*What is internal reproduction? Internal fertilisation is a method of sexual reproduction in which the male gametes are introduced inside the female reproductive organism, as opposed to external fertilisation.*

*What is external reproduction? The union of male and female gametes (male and female reproductive cells) outside the bodies from which they originated, such as frogs and most fish.*

c) Do fish reproduce via internal or external reproduction?

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*Did you know the Australian Lungfish has one lung and as well as gills.*

*Fish (and many animals have air sacs. What is an air sac? Thin-walled sacs or spaces which function as a part of the respiratory system in birds, fishes, insects and mammals.*

d) Do lungfish have teeth?

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**2.**

*What is hibernation? A physiological state that allows survival during long periods of cold temperatures and reduced food supplies, in which metabolism decreases, the heart and respiratory system slow down, and body temperature is maintained at a lower level than normal. For example, a bear experiences voluntary 'deep sleep' driven by cold weather.*

*Did you know we don't have many Australian animals that truly 'hibernate' in Australia.*

*What is torpor? A physiological state that conserves energy by slowing down the heart and respiratory systems.*

*What is brumation? A state or condition of sluggishness, inactivity, or torpor exhibited by reptiles during winter or extended periods of low temperature.*

**a) Find one mammal that conserves its energy via 'torpor' during the cooler months.**

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**b) Find one reptile that conserves its energy via 'brumation' during the cooler months.**

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**3.**

*What is ectothermic? [Gk. ecto, outside + therme, heat]*

*An animal such as a reptile, fish, or amphibian, that must use environmental energy and behavioral adaptations to regulate its body temperature.*

*What is endothermic? (en-doh-thurm) [Gk. endon, within + therme, heat]*

*An animal that uses metabolic energy to maintain a constant body temperature, such as a bird or mammal.*

**a) Name three ectothermic animals in Blinky Bill's Home Tree?**

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**b) Name three endothermic animals in Blinky Bill's Home Tree?**

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**4.**

*Amphibians (and insects) can breathe through their skin!*

**a) Name an amphibian in Blinky Bill's Home Tree that breathes through its skin.**

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**b) Do frogs reproduce via internal or external reproduction?**

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**Crocodile, pelican and eel signage in Wild Island playground (map reference O12) –**

6.

**Crocodiles are one of the world's best mothers. Explain how mother crocodiles care for their hatchlings.**

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7.

**Explain the life cycle of an Australian Pelican –**

*Did you know birds have a different digestive system to mammals.*

*What is a crop? A secular diverticulum (cavity or passage) of the oesophagus just anterior to the entrance to the thorax (chest). Present in all birds.*

*What is a gizzard? The second, or true, muscular stomach of birds, in which the food is crushed and ground, after being softened in the glandular stomach (crop), or lower part of the oesophagus; the gigerium.*

*Did you know birds (and a few other animals) produce uric acid. What is uric acid or urates? An insoluble precipitate of nitrogenous waste excreted by land snails, insects, birds, and some reptiles.*

8.

**How many eggs can female eels carry?**

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*Did you know eels breathe through their skin when on land.*

*Did you know eels hatch genderless and become male or female depending on population density and competition.*

**Tasmanian Devil (map reference Q12) –**

9.

**a) How many young do female Devils give birth to?**

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b) How many teats in the pouch?

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c) What do their powerful jaw muscles and strong teeth allow them to eat?

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*Did you know the Tasmanian Devil has the strongest jaw pressure for a mammal of its size.*

**Kangaroos - paddock (map reference S13) –**

10.

*Some mammals can put their pregnancy 'on pause'.*

*What is a marsupial? (mar-soop-ee-ul) [Gk. marsypos, pouch, little bag]*

*A mammal, such as a koala, kangaroo, or possum, whose young complete their embryonic development inside a maternal pouch called the marsupium.*

*What is embryonic diapause? A state of inactivity and arrested development accompanied by greatly reduced metabolism, as in many egg, insect pupae and plant seeds. It is a mechanism for surviving adverse weather conditions.*

a) Name a marsupial that can diapause.

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*Did you know a kangaroo can have three babies at three different stages at one time – One joey out of the pouch, one in the pouch and one suspended in development.*

*Did you know our Red Pandas and Tammar Wallabies can diapause too.*

*A blastocyst is a fertilised egg in the second stage of growth.*

b) Explain the life cycle of a marsupial.

c) Draw kangaroo poo.

**Capibara - Lost Valley (map reference V14) –**

11.

a) Why do Capybaras eat their own poop?

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**b) How long can Capybaras stay under water for?**

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*Did you know that their front teeth are continuously growing as they are worn down by the tough plants that they eat.*

**Saltwater Crocodile (map reference W13) –**

**12.**

*The stomach of this species is the most acidic known to man.*

*Did you know crocodiles (and other animals such as birds of prey) produce a cast or pellet of bones, claws, beaks, furs and feathers.*

**a) What is the Saltwater Crocodile capable of digesting?**

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**b) Do crocodiles experience ‘torpor’ or ‘brumation’ during the cooler months?**

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**c) What is the crocodile’s jaw pressure?**

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**d) Do crocodiles excrete urine? If not, what do they excrete?**

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**e) How many months of the year do crocodiles not eat? Is this during winter or summer?**

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**Koalas - Near Wombat Den (map reference R8) –**

**13.**

*Currumbin Wildlife Sanctuary is working on artificial insemination programs in partnership with University of Queensland. Artificial insemination is collecting semen from male Koalas and inseminating female Koalas.*

**a) Why is it important that Koalas are genetically diverse?**

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*What is a Psuedo-ruminant animal? An animal that has a stomach with three cavities. They have an enlarged cecum (cavity in the large intestine) that allows them to digest fibrous materials. Also called ‘hind-gut fermenters’ or ‘fore-gut fermenters’.*

*Koalas are ‘hind-gut fermenters’.*

*What is a ruminant animal? An animal that has a stomach with four complete cavities, and that characteristically regurgitates undigested food from the rumen (fore stomach) and masticates it when at rest.*



The only ruminant animals we have at Currumbin Wildlife Sanctuary are the sheep and rams in the Australiana Sheep Shearing Show.

**b) Why do Koalas have a specialised digestive system?**

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Did you know Koala joeys eat their mother's poo! This soft faecal matter is called pap and gives their stomach the beneficial bacteria to digest toxic leaves.

**Wombat Den (map reference - T8) –**

14.

**a) What shape is wombat poo and why?**

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**b) Wombats have continuously growing teeth as they are worn by fibrous grasses. How many rootless teeth do they have?**

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**Dingoes (map reference U7) –**

15.

What is a monotreme? [Gk. monos, single + trema, hole]

An egg-laying mammal, represented by the Platypus and echidna.

What is a placental mammal? A member of a group of mammals, including humans, whose young complete their embryonic development in the uterus, joined to the mother by a placenta.

**a) What order of mammal is the dingo? Marsupial, monotreme or placental?**

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**b) How many times per year does the female dingo come into season?**

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Did you know that domestic dogs are capable of rearing two litters per year.

**Echidnas (near Hospital) (map reference R2) –**

16.

Currumbin Wildlife Sanctuary is working on artificial insemination programs in partnership with University of Queensland.

**Name the other Australian mammal that represents the monotreme order.**

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**Frog Conservation & Research Facility (map reference S5) –**

17.

Does the male or female Pouched Frog have hip pouches to carry their eggs/young?

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*Did you know the female Northern and Southern Gastric Brooding Frogs, now extinct, gave birth via their mouth!*

**Glossy Black Cockatoo (map reference R9) –**

18.

How many chicks can this species of cockatoo raise every two years?

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**Bonus questions –**

19.

Name another placental mammal at Currumbin Wildlife Sanctuary (other than the dingo)

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20.

*What is a monogastric animal? Having only one digestive cavity.*

Name a monogastric animal at Currumbin Wildlife Sanctuary.

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# AMAZING ANATOMIES — ANSWER SHEET

## Discover how animals ‘poo, eat, breathe and mate’?!

In small groups (with an adult), complete the worksheet. We recommend staggered groups to minimise congestion if multiple classes. Read the exhibit signage as well as the worksheet to discover the answers. Worksheet sections/locations can be completed in any order. Come back to a question if you can't answer it right away as you might find it on a sign later.

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### Blinky Bill's Home Tree

(Freshwater animals, nocturnal mammals and reptiles map reference B14) –

1.

a) Find an animal that can survive in stagnant ponds with low oxygen.

Australian Lungfish

b) What is special about the way this particular fish breathes? How do most fish breathe?

It has a lung. Most fish have gills.

*What is internal reproduction? Internal fertilisation is a method of sexual reproduction in which the male gametes are introduced inside the female reproductive organism, as opposed to external fertilisation.*

*What is external reproduction? The union of male and female gametes (male and female reproductive cells) outside the bodies from which they originated, such as frogs and most fish.*

c) Do fish reproduce via internal or external reproduction?

Internal reproduction

*Did you know the Australian Lungfish has one lung and as well as gills.*

*Fish (and many animals have air sacs. What is an air sac? Thin-walled sacs or spaces which function as a part of the respiratory system in birds, fishes, insects and mammals.*

d) Do lungfish have teeth?

They have bony tooth plates.

2.

*What is hibernation? A physiological state that allows survival during long periods of cold temperatures and reduced food supplies, in which metabolism decreases, the heart and respiratory system slow down, and body temperature is maintained at a lower level than normal. For example, a bear experiences voluntary ‘deep sleep’ driven by cold weather.*

*Did you know we don't have many Australian animals that truly ‘hibernate’ in Australia.*

*What is torpor? A physiological state that conserves energy by slowing down the heart and respiratory systems.*



*What is brumation? A state or condition of sluggishness, inactivity, or torpor exhibited by reptiles during winter or extended periods of low temperature.*

**a) Find one mammal that conserves its energy via 'torpor' during the cooler months.**

Squirrel Glider, Yellow-bellied Glider, Feathertail Glider, Long-nosed Potoroo

**b) Find one reptile that conserves its energy via 'brumation' during the cooler months.**

Merten's Water Monitor, Eastern Long-necked Turtle, Frilled Lizard, Freshwater Crocodile, Scrub Python, Green Tree Snake, Coastal Carpet Python Broad-headed Snake, Common Coastal Death Adder, Collet's Black Snake, Knob-tailed Gecko

**3.**

*What is ectothermic? [Gk. ecto, outside + therme, heat]*

*An animal such as a reptile, fish, or amphibian, that must use environmental energy and behavioral adaptations to regulate its body temperature.*

*What is endothermic? (en-doh-thurm) [Gk. endon, within + therme, heat]*

*An animal that uses metabolic energy to maintain a constant body temperature, such as a bird or mammal.*

**a) Name three ectothermic animals in Blinky Bill's Home Tree?**

Same as answers for 2b (reptiles that bromate) + Magnificent Green Tree Frog, Australian Lungfish

**b) Name three endothermic animals in Blinky Bill's Home Tree?**

Mammals - Same answers as 2a (mammals that torpor) + Spinifex Hopping Mouse, Water Rat

**4.**

*Amphibians (and insects) can breathe through their skin!*

**a) Name an amphibian in Blinky Bill's Home Tree that breathes through its skin.**

Magnificent Green Tree Frog

**b) Do frogs reproduce via internal or external reproduction?**

External reproduction

**Crocodile, pelican and eel signage in Wild Island playground (map reference O12) –**

**6.**

**Crocodiles are one of the world's best mothers. Explain how mother crocodiles care for their hatchlings –**

Female crocodiles build nest in vegetation, 40-70 eggs are laid, mothers protect nest and fight off other crocodiles, goannas, feral pigs and humans, hatchlings squawk until mother helps dig free, mothers may carry in mouth to water, at 5 weeks hatchlings leave protection of their mother.

**7.**

**Summarise the lifecycle of an Australian Pelican –**

- Pelicans breed in colonies of up to 40,000 on islands and secluded shore. Breed at any time pending environmental conditions



- Breeding begins with courtship walking and swimming. Females leads 2-8 males across land and air. Males threaten each other with swinging open bills to attract female
- During courtship bill and pouch change from pink to blue and chrome yellow. This subsides by egg incubation
- Lay 1-3 eggs, 2-3 days apart. Eggs are incubated on the parents' feet for 32-35 days
- The first-hatched chick is larger than its siblings. It receives the most food and may even attack or kills its nest mates
- After about a month chicks leave nests to form crèches of up to 100 birds. They remain in the crèche for about two months before they learn to fly and are fairly independent.

*Did you know birds have a different digestive system to mammals.*

*What is a crop? A secular diverticulum (cavity or passage) of the oesophagus just anterior to the entrance to the thorax (chest). Present in all birds.*

*What is a gizzard? The second, or true, muscular stomach of birds, in which the food is crushed and ground, after being softened in the glandular stomach (crop), or lower part of the oesophagus; the gigerium.*

*Did you know birds (and a few other animals) produce uric acid. What is uric acid or urates? An insoluble precipitate of nitrogenous waste excreted by land snails, insects, birds, and some reptiles.*

**8.**

**How many eggs can female eels carry?**

Three million eggs

*Did you know eels breathe through their skin when on land .*

*Did you know eels hatch genderless and become male or female depending on population density and competition.*

**Tasmanian Devil (map reference Q12) –**

**9.**

**a) How many young do female devils give birth to?**

40

**b) How many teats in the pouch?**

4

**c) What do their powerful jaw muscles and strong teeth allow them to eat?**

Every part of a carcass (dead animals, birds, insects, wallabies and wombats) including the skull.

*Did you know the Tasmanian Devil has the strongest jaw pressure for a mammal of its size.*

**Kangaroos - paddock (map reference S13) –**

**10.**

*Some mammals can put their pregnancy 'on pause'.*



*What is a marsupial? (mar-soop-ee-ul) [Gk. marsypos, pouch, little bag]*

*A mammal, such as a Koala, kangaroo, or possum, whose young complete their embryonic development inside a maternal pouch called the marsupium.*

*What is embryonic diapause? A state of inactivity and arrested development accompanied by greatly reduced metabolism, as in many egg, insect pupae and plant seeds. It is a mechanism for surviving adverse weather conditions.*

**a) Name a marsupial that can diapause.**

**Kanagaroo**

*Did you know a kangaroo can have three babies at three different stages at one time - One joey out of the pouch, one in the pouch and one suspended in development.*

*Did you know our Red Pandas and Tammar Wallabies can diapause too.*

*A blastocyst is a fertilised egg in the second stage of growth.*

**b) Summarise the lifecycle of a marsupial.**

- **Mating**
- **Female gives birth after 21-28 days**
- **While joey attached to nipple in pouch, fertilised egg from another mating develops to the blastocyst stage and stops growing**
- **Joey emerges from pouch, the blastocyst is switched back on and continues growing**
- **Blastocyst grows to become a new offspring which is born while previous joey still suckling**
- **Female produces milk of two different strengths for its two dependent offspring - one joey in pouch and another which suckles from the outside until independent.**

**c) Draw kangaroo poo.**



**Capybara - Lost Valley (map reference V14) –**

**11.**

**a) Why do Capybaras eat their own poop?**

**To get beneficial bacteria to help their stomach break down the thick fibre in their meals.**

**b) How long can Capybaras stay under water for?**

**Five minutes**

*Did you know that their front teeth are continuously growing as they are worn down by the tough plants that they eat.*



**Saltwater Crocodile (map reference W13) –**

**12.**

*The stomach of this species is the most acidic known to man.*

*Did you know crocodiles (and other animals such as birds of prey) produce a cast or pellet of bones, claws, beaks, furs and feathers.*

**a) What is the Saltwater Crocodile capable of digesting?**

Large bones of prey

**b) Do crocodiles experience ‘torpor’ or ‘brumation’ during the cooler months?**

Brumation

**c) What is the crocodile’s jaw pressure?**

3500 psi

**d) Do crocodiles excrete urine? If not, what do they excrete?**

Uric acid or urates

**e) How many months of the year do crocodiles not eat? Is this during winter or summer?**

6 months during winter

**Koalas - Near Wombat Den (map reference R8) –**

**13.**

*Currumbin Wildlife Sanctuary is working on artificial insemination programs in partnership with University of Queensland. Artificial insemination is collecting semen from male Koalas and inseminating female Koalas.*

**a) Why is it important that Koalas are genetically diverse?**

To reduce the side effects of inbreeding.

*What is a Psuedo-ruminant animal? An animal that has a stomach with three cavities. They have an enlarged cecum (cavity in the large intestine) that allows them to digest fibrous materials. Also called ‘hind-gut fermenters’ or ‘fore-gut fermenters’.*

*Koalas are ‘hind-gut fermenters’.*

*What is a ruminant animal? An animal that has a stomach with four complete cavities, and that characteristically regurgitates undigested food from the rumen (fore stomach) and masticates it when at rest.*

*The only ruminant animals we have at Currumbin Wildlife Sanctuary are the sheep and rams in the Australiana Sheep Shearing Show.*

**b) Why do Koalas have a specialised digestive system?**

To eat and receive nutrients from toxic leaves

*Did you know Koala joeys eat their mother’s poo! This soft faecal matter is called pap and gives their stomach the beneficial bacteria to digest toxic leaves.*



**Wombat Den (map reference T8) –**

14.

**a) What shape is wombat poo and why?**

Square because they like to mark their territory by depositing it on top of rocks so it won't roll away.

**b) Wombats have continuously growing teeth as they are worn by fibrous grasses. How many rootless teeth do they have?**

24

**Dingoes (map reference U7) –**

15.

*What is a monotreme? [Gk. monos, single + trema, hole]  
An egg-laying mammal, represented by the platypus and echidna.*

*What is a placental mammal? A member of a group of mammals, including humans, whose young complete their embryonic development in the uterus, joined to the mother by a placenta.*

**a) What order of mammal is the dingo? Marsupial, monotreme or placental?**

Placental

**b) How many times per year does the female dingo come into season?**

Once

*Did you know that domestic dogs are capable of rearing two litters per year.*

**Echidnas (near Hospital) (map reference R2) –**

16.

*Currumbin Wildlife Sanctuary is working on artificial insemination programs in partnership with University of Queensland.*

**Name the other Australian mammal that represents the monotreme order**

Platypus

**Frog Conservation & Research Facility (map reference S5) –**

17.

**Does the male or female Pouched Frog have hip pouches to carry their eggs/young?**

Male

*Did you know the female Northern and Southern Gastric Brooding Frogs, now extinct, gave birth via their mouth!*



**Glossy Black Cockatoo** (map reference R9) –

18.

How many chicks can this species of cockatoo raise every two years?

One

**Bonus questions** –

19.

Name another placental mammal at Currumbin Wildlife Sanctuary (other than the dingo)

Platypus

20.

*What is a monogastric animal? Having only one digestive cavity.*

Name a monogastric animal at Currumbin Wildlife Sanctuary

Bilbies, Cotton-top Tamarins, dingoes, echidnas.