



Science

# Life Cycles of Animals and Plants

**Pupil Workbook**  
Year 5 Unit 4

Name:

### What is a living thing?

A living thing is something that has the following features: it is able to move, grow, change, absorb nutrients and reproduce.

### What is a life cycle?

A life cycle is the complete cycle of different changes at different times, from young to an adult.

### Which living things have life cycles?

All living things have life cycles. Each living thing has a sequence of stages that they undergo where their body grows and changes.

Bigger animals such as African Elephants have an average life span of 70 years or more. The Arctic Whale is known to have a life span of more than 200 years.

On the other hand, smaller animals such as types of insects like the mayfly, on average have a life span of 24 hours. A different insect such as a Drone Ant, again on average, has a life span of 3 weeks.

It is important to remember that across the life span of each living thing, there are different stages of development. Not matter how big or small the living thing might be.

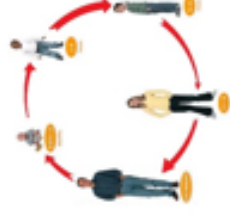


### Glossary of terms

Living thing	A life form that grows and changes over time
Life span	The average length of time a living thing is alive
Life cycle	The stages that take place in order for a living thing to grow and change
Reptiles	A cold blooded group of animals that lay their young eggs
Insects	A group of animals that undergo a complete or incomplete metamorphosis over their life span
Mammals	A group of animals that grow and develop their young in their mother's womb
Marsupials	A sub group of mammals that grow and develop their young in the mother's womb. They also rear their young in pouches on their body until they are older.
Germination	The process by which some plants reproduce. The seed is germinated and then grows into a separate plant.
Pollination	The process by which some plants reproduce. The seed is fertilised by pollen and then grows into a separate plant.
Incomplete and Complete Metamorphosis	The stages of growth and change that an insect goes through to reach adulthood.

### Do humans have the same life cycle as other animals?

Yes, humans do have the same stages in their life cycle as other mammals a similar size. After fertilization, the baby develops in the mother's womb for 9 months. This period is called the gestation period. After 9 months, the baby is born and the parents are responsible for feeding and providing care for the baby until they are old enough to take care of themselves.



Mammals such as mice, provide milk and care for their young for 9 weeks, whereas humans do the same for their babies for many years!

## Existing Knowledge

### What makes a living thing a 'living thing'?

Write down everything you already know about living things:



Session 1:

## What are the features of living things?

Key Knowledge	Key Vocabulary
<p>A living thing has several important features</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Living things absorb nutrients and water</li> <li><input type="checkbox"/> Living things are able to move independently</li> <li><input type="checkbox"/> Living things grow, change and reproduce</li> <li><input type="checkbox"/> Living things require rest and shelter</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> absorb</li> <li><input type="checkbox"/> nutrients</li> <li><input type="checkbox"/> movement</li> <li><input type="checkbox"/> change</li> <li><input type="checkbox"/> reproduce</li> <li><input type="checkbox"/> rest</li> </ul>

Have you thought of life as a cycle? With a clear beginning, defined stages and an end? The term living thing refers to things that are now or once were alive. A non-living thing is anything that was never alive. In order for something to be classified as living, it must grow and change, use energy, reproduce, be made of cells, respond to its environment, and adapt. In this unit, we will study a wide range of living things; and how they grow and change.

**Thinking Task:** Using the key knowledge, how many features of living things can you see in each image?



Use the images complete the following sentences:

1. An octopus **is** a living thing because

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2. A mountain **is not** a living thing because

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3. Water **is not** a living thing because

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**Task:** Complete the table (using ticks and crosses) and respond the question below:

				
<b>Does it absorb nutrients and water?</b>				
<b>Is it able to move independently?</b>				
<b>Does it grow and change?</b>				
<b>Does it reproduce?</b>				
<b>Does it require rest and shelter?</b>				

**Task:** Explain what living things are. Then explain why an octopus is a living thing and a mountain is not.

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Session 2:

## How do plants grow and change?

Key Knowledge	Key Vocabulary
<ul style="list-style-type: none"><li><input type="checkbox"/> Plants grow and change in different ways</li><li><input type="checkbox"/> Some plants germinate their own seeds independently to grow another plant.</li><li><input type="checkbox"/> Other plants need help from insects to help them pollinate their seeds to grow another plant.</li><li><input type="checkbox"/> Pollination is the process of pollen from flowers being transported from plant to plant via insects</li><li><input type="checkbox"/> Bees and other insects have an important role in pollinating plants to ensure that they reproduce.</li><li><input type="checkbox"/> There are many other benefits to pollination, such as varieties of plants, honey and nutrients for insects.</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> plants</li><li><input type="checkbox"/> independently</li><li><input type="checkbox"/> germinate</li><li><input type="checkbox"/> pollinate</li><li><input type="checkbox"/> pollen</li><li><input type="checkbox"/> transported</li><li><input type="checkbox"/> reproduce</li><li><input type="checkbox"/> nutrients</li></ul>

## Knowledge Quiz

1. Which two of the following are features of a living thing?

They must swim in water

They must grow and change

They must move independently

They must eat plants

2. Bees support the growth of

some plants

no plants

all plants

mountains

3. Circle each that applies: An octopus is a living thing because

it breathes

it has 8 tentacles

eats and drinks

has two hearts

4. Circle each that applies: A mountain is not a living thing because

it doesn't rest

it has trees on it

it doesn't grow

it is a habitat

5. Flowering plants benefit from bees:

flying past the plant

making honey

having wings

transporting pollen

## How do plants grow and change?

Plants grow and change in two important ways. Non-flowering plants germinate (produce and fertilise) their own seeds to reproduce another plant. Whilst, plants that flower, reproduce with the help of insects through pollination. This is when an insect such as a bee flies from plant to plant, collecting pollen.



The process of pollination is complex and helps both the insect and the flower. The flower provides the nutrients for the insect (nectar and pollen) to feed itself and its young. The bee provides a way for the pollen to travel from flower to flower. The two processes are linked and both living things benefit.

The process of germination is different. The seed is dormant inside the plant (not growing) and is only activated once the outside conditions are suited to growth. This includes amount of water, humidity in the air and the temperature. Once these environmental factors are good, the seed will germinate and start growing another plant. That is why most plants grow more in spring!

**Task:** What are the differences between the plants below?




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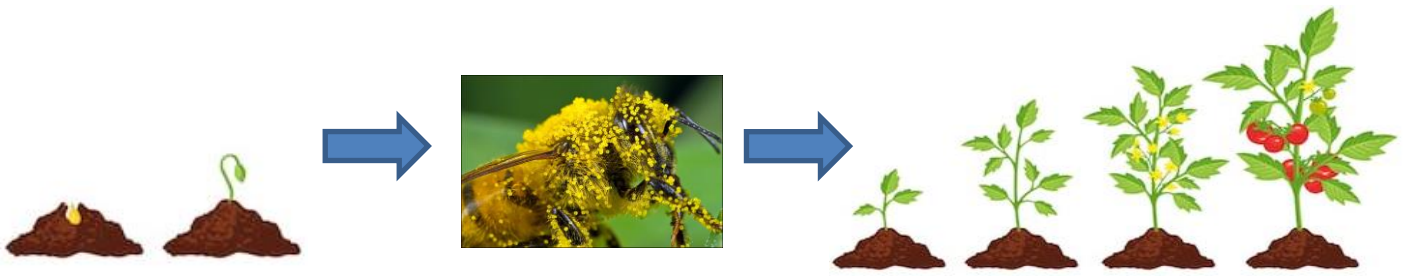
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**Task:** Describe each step in the flow chart below




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Conjunctions	Scientific Nouns	Scientific verbs	Other
First Next Then After that Finally	insects pollen flowers leaves petals	pollinate travel attracted carries pollination	As a result, Additionally,

**Task:** Explain how plants grow and change:

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Session 3:

## How do insects grow and change?

Key Knowledge	Key Vocabulary
<ul style="list-style-type: none"> <li><input type="checkbox"/> Insects have a short life span and have a faster life cycle when compared to other animals</li> <li><input type="checkbox"/> Some insects grow and change by incomplete metamorphosis</li> <li><input type="checkbox"/> Incomplete metamorphosis occurs when an insects body grows and changes in different stages to become an adult e.g. a grasshopper's exoskeleton hardens and it grows wings</li> <li><input type="checkbox"/> Some insects grow by incomplete metamorphosis</li> <li><input type="checkbox"/> Complete metamorphosis occurs when an insect goes through separate stages of growth to where the adult, in no way, represents the larvae e.g. changes from a caterpillar to a butterfly</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> incomplete metamorphosis</li> <li><input type="checkbox"/> fertilise</li> <li><input type="checkbox"/> egg</li> <li><input type="checkbox"/> nymph</li> <li><input type="checkbox"/> complete metamorphosis</li> <li><input type="checkbox"/> emerge</li> <li><input type="checkbox"/> pupa</li> <li><input type="checkbox"/> larvae</li> <li><input type="checkbox"/> chrysalis</li> </ul>

### Knowledge Quiz

1. Which group of animals undergo a complete or incomplete metamorphosis?

reptiles

insects

birds

mammals

2. Caterpillars eat a lot of leaves to prepare to form their:

chrysalis

skin

branch

wings

3. A caterpillar forms its chrysalis and remains inside it for

2 – 5 days

2- 5 hours

2 – 5 weeks

2 – 5 years

4. Birds and most reptiles both call their young

hens

chrysalis

fertilise

hatchlings

5. Tick the answers that apply. Birds and most reptiles also

lay eggs

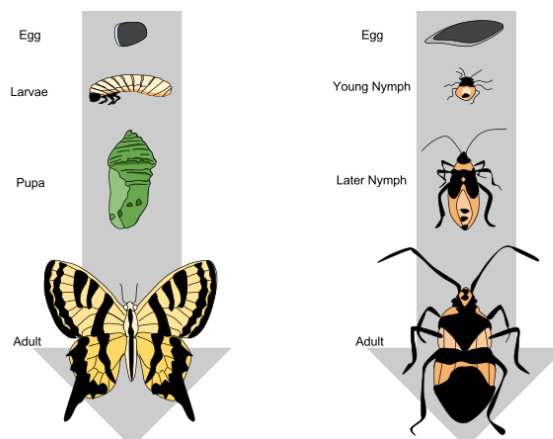
have young that hatch out of eggs

hatch partially formed

have eggs fertilized by the male

## How do insects grow and change?

Insects grow and change in two different ways. Some insects, like grasshoppers and cockroaches, undergo a process called incomplete metamorphosis. This means that the living does change throughout its life, but it is still recognizable as that specific living thing. Other insects undergo a complete metamorphosis. Insects such as butterflies, ants and beetles go through distinct changes through their life cycle that are different to each other.



**Thought Task:** What differences can you see in these insects' life cycles?



Molting stage of a grasshopper life cycle



Chrysalis stage of the butterfly life cycle

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**Task:** We can see that both the grasshopper and the butterfly go through significant changes. The butterfly, however, undergoes a **complete metamorphosis**. Explain how this is different to an *incomplete metamorphosis*.

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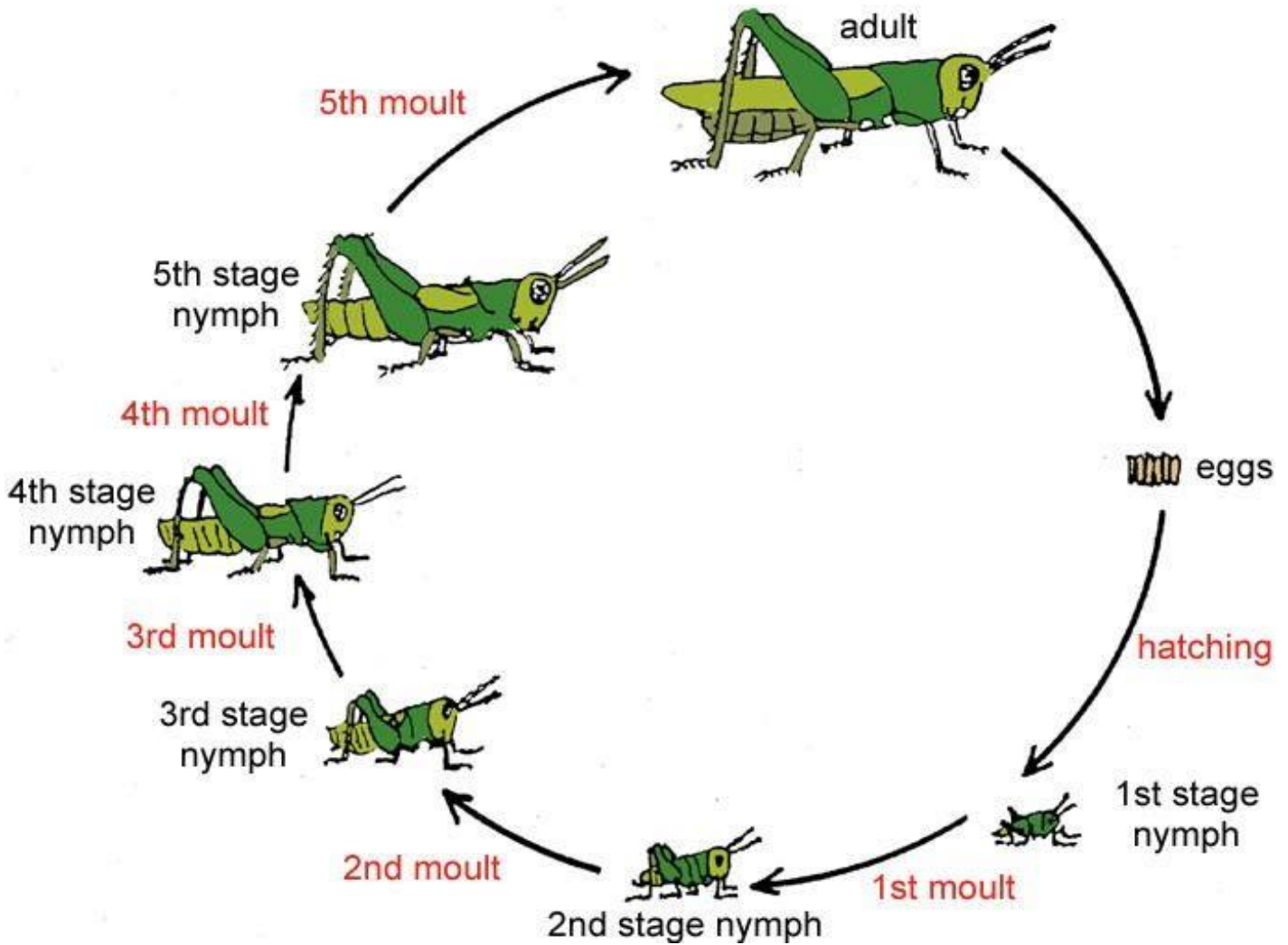
**Task:** Life cycle of a butterfly. Fill in the missing words from the key vocabulary to complete this explanation:



### Complete Metamorphosis – The Butterfly

A caterpillar is born from an egg. It eats a lot of leaves to prepare for this stage of its me\_\_\_\_\_, when it changes from an egg to a p\_\_\_\_\_. This stage takes between 2 – 5 weeks. At this stage, the caterpillar had changed shed its skin up to five times. After this, the c \_\_\_\_\_ then prepares to pupate or form its ch\_\_\_\_\_. This stage takes between 1 – 2 weeks. This is a dangerous time for butterflies as predators could eat them. Finally, a b \_\_\_\_\_ emerges from the chrysalis, when its outer body and wings harden in preparation for flight. This process is called com\_\_\_\_\_ meta \_\_\_\_\_

**Task:** Describe the life cycle of a grasshopper



### Incomplete metamorphosis – The Grasshopper

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Session 4:

## Do birds and reptiles grow and change in the same way?

Key Knowledge	Key Vocabulary
<ul style="list-style-type: none"> <li><input type="checkbox"/> Birds and reptiles grow and change in similar ways</li> <li><input type="checkbox"/> Both birds and reptiles lay eggs, from which their young hatch and then grow into adults</li> <li><input type="checkbox"/> Birds, such as chickens, usually take around 10 weeks to grow from an egg to a mature hen</li> <li><input type="checkbox"/> Reptiles, such as lizards, usually take around 18- 24 months to grow from an egg to a mature female</li> <li><input type="checkbox"/> The egg is fertilized inside the animal, it is then laid by the female to continue its development</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> birds</li> <li><input type="checkbox"/> egg</li> <li><input type="checkbox"/> chick</li> <li><input type="checkbox"/> pullet</li> <li><input type="checkbox"/> hen</li> <li><input type="checkbox"/> cockerel</li> <li><input type="checkbox"/> hatchling</li> <li><input type="checkbox"/> reptiles</li> </ul>

### Knowledge Quiz 4.2

1. Which group of animals undergo a complete or incomplete metamorphosis?

reptiles     
  insects     
  birds     
  mammals

2. Caterpillars eat a lot of leaves to prepare to form their:

chrysalis     
  skin     
  branch     
  wings

3. A caterpillar forms its chrysalis and remains inside it for:

2 – 5 days     
  2- 5 hours     
  2 – 5 weeks     
  2 – 5 years

4. Birds and most reptiles both call their young:

hens     
  chrysalis     
  fertilise     
  hatchlings

5. Circle the answers that apply. Birds and most reptiles also:

lay eggs     
  have young that hatch out of eggs     
  hatch partially formed     
  have eggs fertilized by the male

## How do birds and reptiles grow and change?



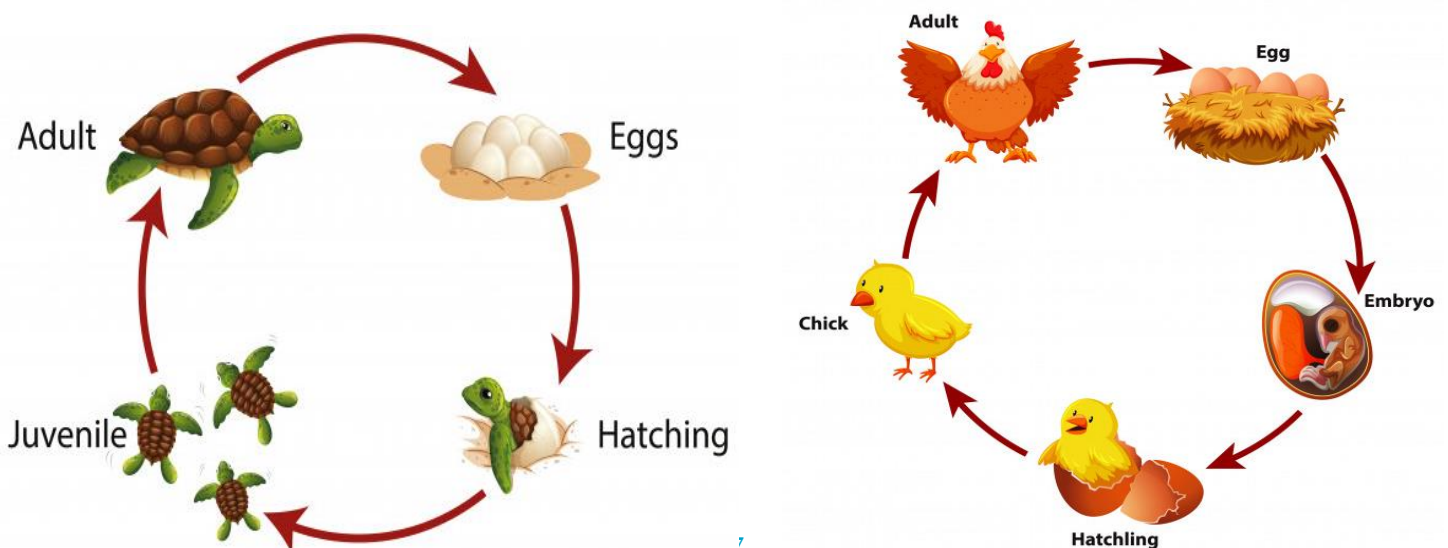
Birds and reptiles grow and change in similar ways. Both animal groups, while looking, moving and sounding very different to each other, grow and change in similar ways.

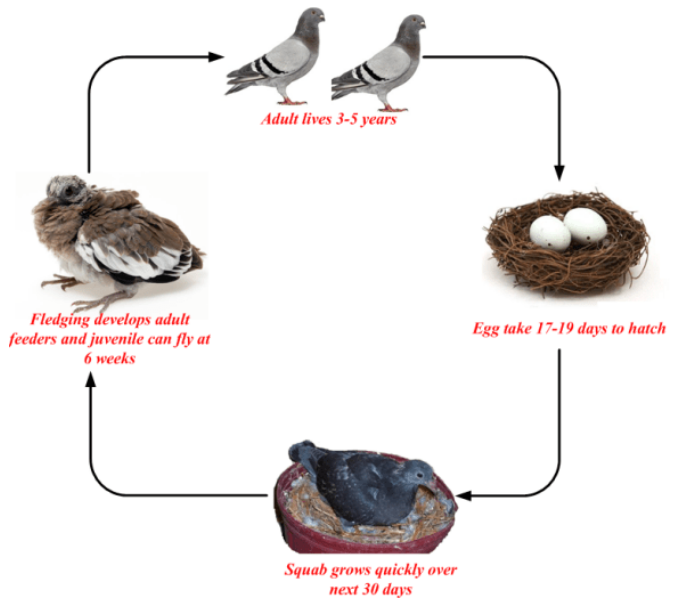
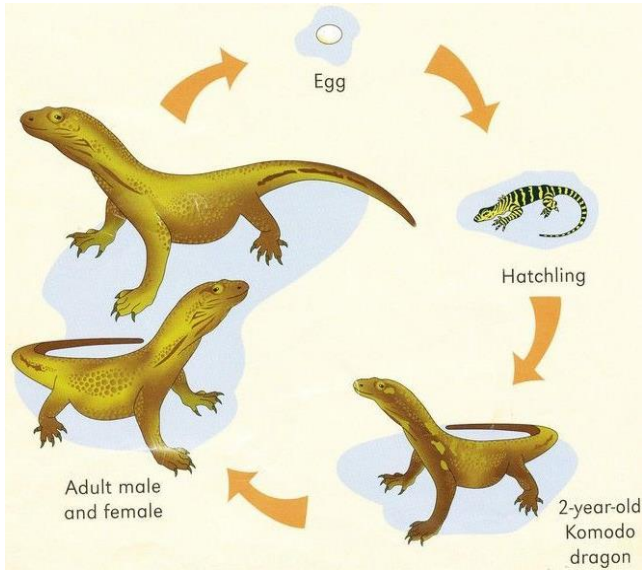
Both birds and reptiles

- lay eggs that need to be taken care of until they hatch
- have young that grow and change inside an egg; and
- give birth to live young

These two animal groups often live in the same habitats. There is a good reason for this. The time that an egg is incubating is when the adult is protecting the eggs safe from danger or predators, sometimes by sitting on them!

**Task:** Identify three similarities and three differences between these animal groups:





Similarities:

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Differences:

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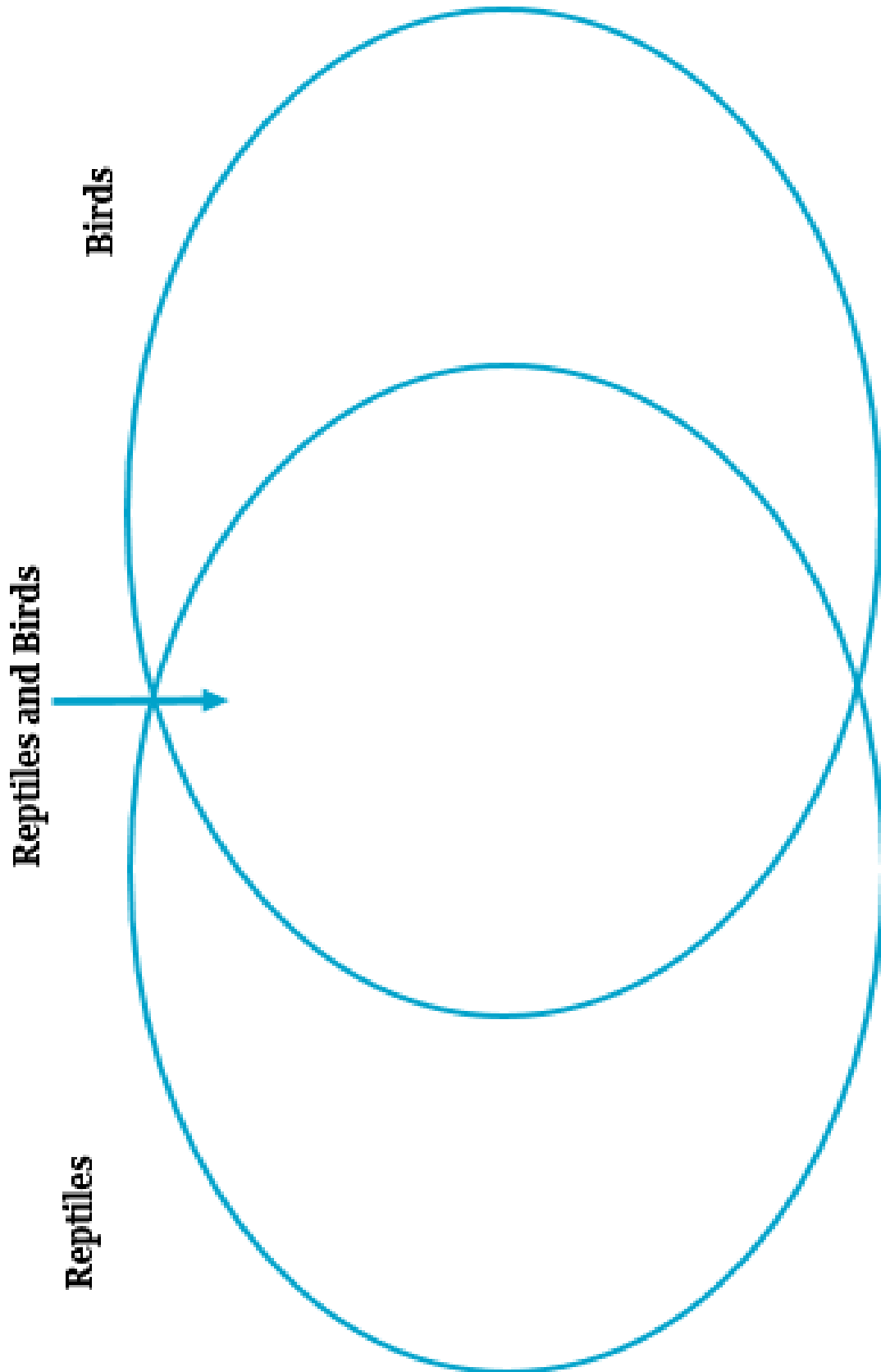
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**Task:** Complete the following Venn diagram to show the similarities and differences between reptile and bird life cycles:







## Session 5:

### How do mammals grow and change?

Key Knowledge	Key Vocabulary
<ul style="list-style-type: none"><li><input type="checkbox"/> Mammals are warm-blooded animals that have hair or fur at some point in their lives</li><li><input type="checkbox"/> Mammals take care of and protect their young more than other groups of animals, such as birds, insects or reptiles</li><li><input type="checkbox"/> Mammals give birth to live babies and fed them mother's milk</li><li><input type="checkbox"/> Humans are a type of mammal</li><li><input type="checkbox"/> The gestation period of an animal is the duration for which the female of the species is pregnant with their young</li><li><input type="checkbox"/> Mammals have a wide range of gestation periods from 6 weeks (squirrels) to 22 months (elephants)</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> mammals</li><li><input type="checkbox"/> warm – blooded</li><li><input type="checkbox"/> live young</li><li><input type="checkbox"/> gestation period</li><li><input type="checkbox"/> pregnant</li><li><input type="checkbox"/> reproduction</li><li><input type="checkbox"/> foetus</li><li><input type="checkbox"/> egg</li></ul>

### Knowledge Quiz

1. Which group of animals undergo a complete or incomplete metamorphosis?

reptiles

insects

birds

mammals

2. Snakes and lizards have this in common

have fur

lay eggs

germinate their eggs

are warm blooded

3. A reptile develops from a:

fertilised egg

pollinated seed

chrysalis

pouch

4. Birds and most reptiles both call their young

hens

chrysalis

fertilise

hatchlings

5. Tick the answers that apply. Birds and most reptiles also

lay eggs

have young that hatch out of eggs

hatch partially formed

have eggs fertilized by the male

## How do mammals grow and change?

Mammals grow and change in the same way. Members of the animal group *Mammalia* all undergo the same steps in their growth from babies to adults. This does vary a great deal between species.

The most significant difference is that mammals grow and develop their young inside their mother's bodies. This is different for insects, birds and reptiles as the young from these groups grow and develop inside their shell or casing.

Mammals take care of their young for longer once they are born. Again, this varies between species of mammals and is a big difference between mammal and non - mammal groups.

**Task:** What is the same about each of these groups of living things?

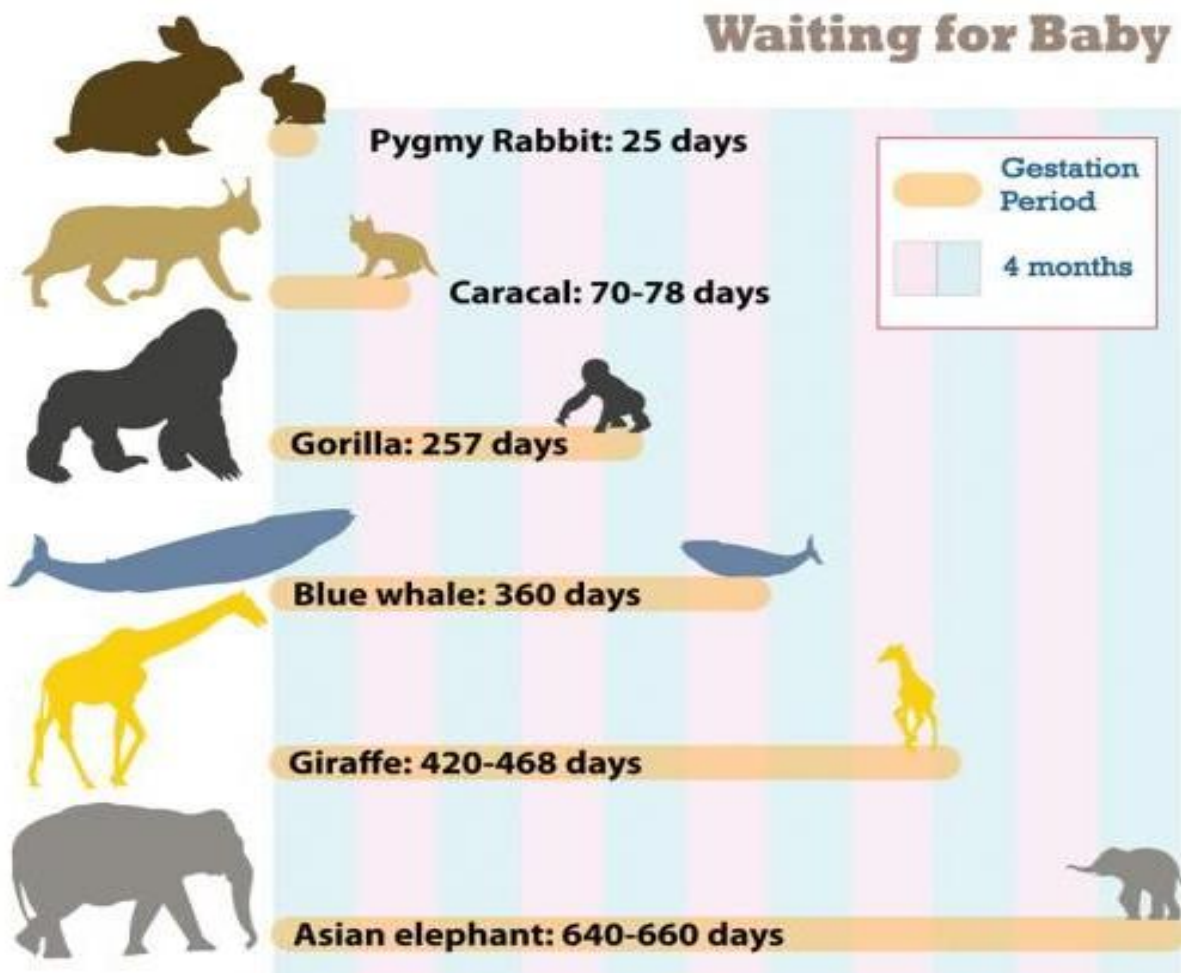


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**Task:** Answer the questions from the following graph



- 1) Which mammal has the longest gestation period? \_\_\_\_\_
- 2) Which mammal has the shortest gestation period? \_\_\_\_\_
- 3) How long is the gestation period for a giraffe? \_\_\_\_\_
- 4) What is the difference in length, between the gestation period of a gorilla and a caracal? \_\_\_\_\_



Session 6:

## How do marsupials grow and change?

Key Knowledge	Key Vocabulary
<ul style="list-style-type: none"> <li><input type="checkbox"/> Marsupials are a sub group of mammals that give birth to live young that are not yet fully developed.</li> <li><input type="checkbox"/> A marsupial's young is born without a casing or shell and crawls along the mother's body to its mothers pouch. It stays there until it is fully developed and able to find food and shelter by itself.</li> <li><input type="checkbox"/> Marsupials have a shorter gestation period than other mammals. Marsupials spend longer growing in their mother's pouch than inside the mother's womb.</li> <li><input type="checkbox"/> There are three types of Mammals               <ul style="list-style-type: none"> <li>- Marsupials such as kangaroos, koalas and wombats</li> <li>- Placental mammals such as humans, goats, elephants and monkeys.</li> <li>- Monotremes such as platypus and echidnas</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> mammal</li> <li><input type="checkbox"/> marsupial</li> <li><input type="checkbox"/> placental mammals</li> <li><input type="checkbox"/> monotremes</li> <li><input type="checkbox"/> pouch</li> <li><input type="checkbox"/> placenta</li> <li><input type="checkbox"/> fully formed</li> <li><input type="checkbox"/> not fully formed</li> </ul>

### Knowledge Quiz 4.5

1. The time that a baby animal develops inside its mother's body is called the:

digestion period

gestation period

mammal period

mammals

2. The graph showed that a giraffe has a longer gestation period than a:

gorilla

elephant

blue whale

parrot

3. Humans have a gestation period of:

8 months

8 hours

9 months

9 hours

4. Both humans and other mammals:

feed their young milk

pollinate seeds

have pouches

change into pupae

5. Tick those that apply. Mammals do not

have fur

hatch their young from eggs

give birth to fully formed babies

undergo complete metamorphosis



## How do marsupials and other types of mammal grow and change?

Marsupials are a special sub group of mammals. Most mammals have a pouch. This pouch acts as place for marsupial young to feed on their mother's milk and to rest. Not all marsupials have a visible pouch; some have a fold of skin and fur protects their young or some have none at all. Other unique features of marsupials include webbed fingers or fused toes. These assist the animal in feeding or grooming.

Other mammals include monotremes and placental mammals. Monotremes are a sub group of mammals that lay eggs and their young hatch from these eggs. Placental mammals are a different sub group of mammals that have a longer gestation period. Their young feed from an organ called a placenta. This organ provides the growing baby with oxygen and nutrients during the pregnancy.



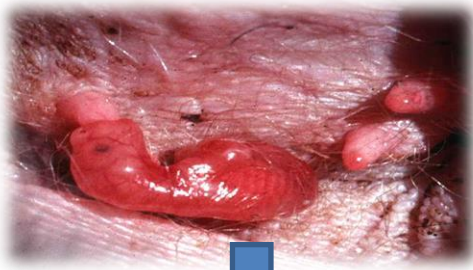
**The fused toes of some marsupials**



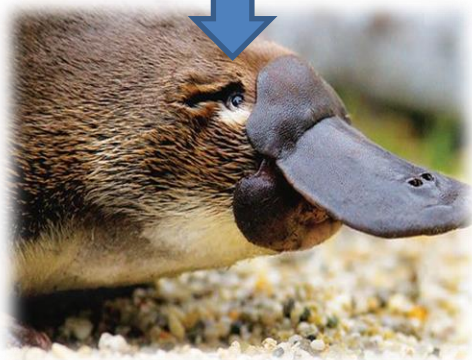
**A blue eyed spotted cuscus**



**Task:** Compare the similarities and differences between these types of mammals



<b>Group: Mammals Subgroup: Marsupials</b>	
<b>Similarities</b>	<b>Differences</b>



**Group: Mammals Subgroup: Monotremes**

**Similarities**

**Differences**



**Group: Mammals Subgroup: Placental Mammals**

**Similarities**

**Differences**

