

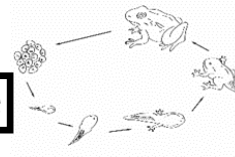
**In this unit we will**

1. Review and revise the stages in plant life cycles
2. **Compare & contrast insect and amphibian life cycles**
3. Study the life cycle of birds
4. Look at mammal life cycles and how they can differ from one another
5. Study the different stages of the human life cycle
6. Learn about the changes that occur in human development, including puberty

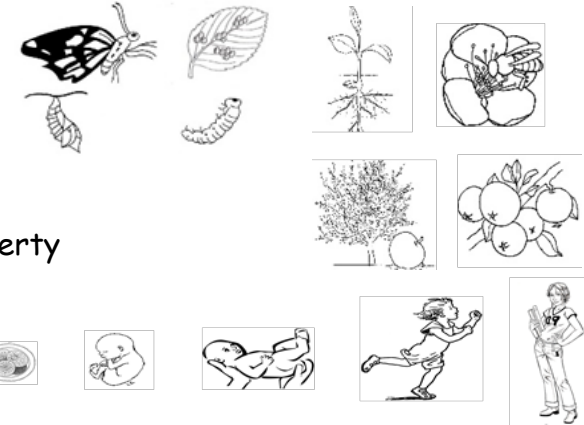
**Science Skills that we will develop:**

### Explaining Science

1. I use complex science words correctly
2. I use a science model to describe and explain
3. **I draw & annotate diagrams to help describe/explain**



# Life Cycles



### Data, tables & Graphs

I use a frame to construct a graph and begin to scale axes

Revise the life cycle of flowering plants



Look at asexual reproduction in plants



Learn about, draw and annotate an amphibian life cycle

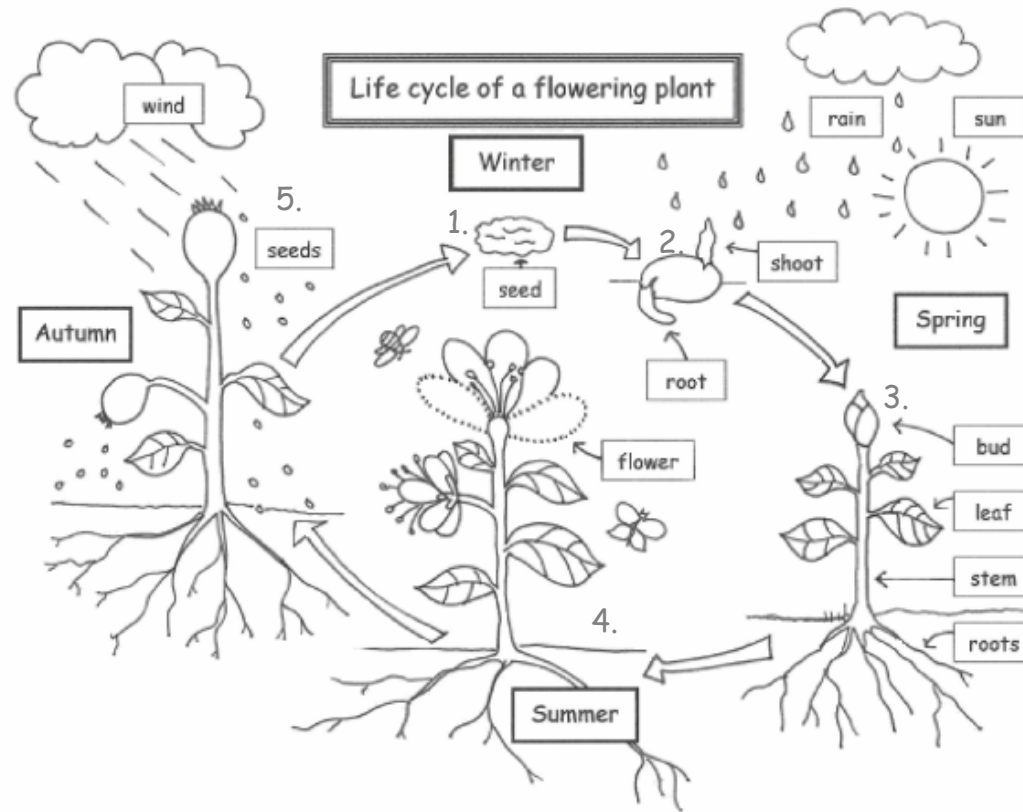


Learn about and annotate two different insect life cycles

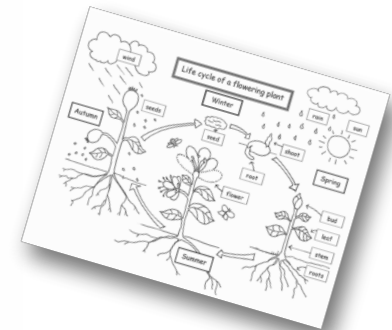


Make comparisons between plant, amphibian & insect life cycles

With a partner, discuss each of the 5 stages in the life cycle of a flowering plant shown in the diagram.



Describe what is happening at each stage, and try to use as many scientific words as you can.



1.



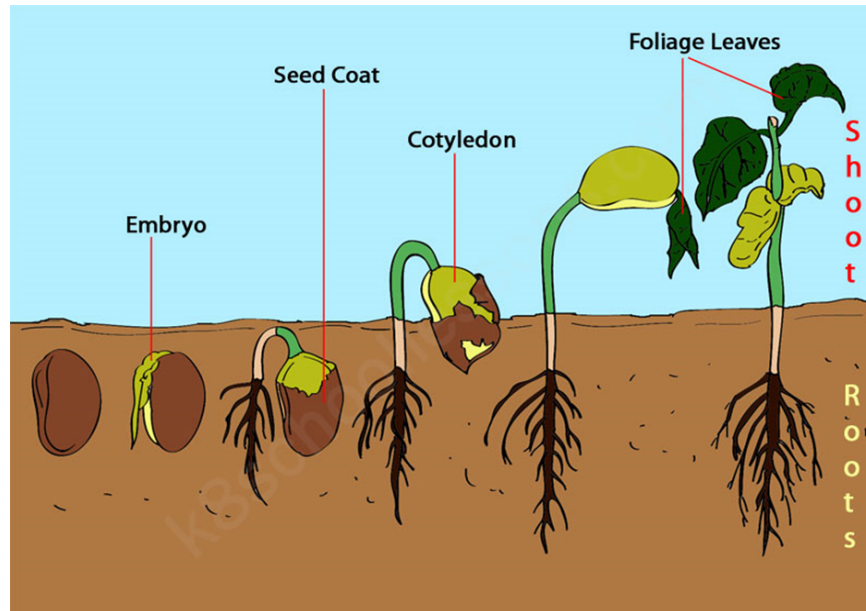
Seeds will remain **dormant** (inactive) unless they receive the right conditions for growth.

All seeds need water, oxygen and the right temperature conditions to begin germination.

Moisture is the most important of these.



2. & 3.



**Germination** is the very beginning of new life, when a seed splits and begins to grow. **Nutrients** stored in the seed allow the **embryo** to grow **roots** and a **shoot**. This then grows one or more **primary leaves**, allowing the seedling to begin to **photosynthesise** and make the true, **foliage leaves**

#### 4. Pollination & fertilisation



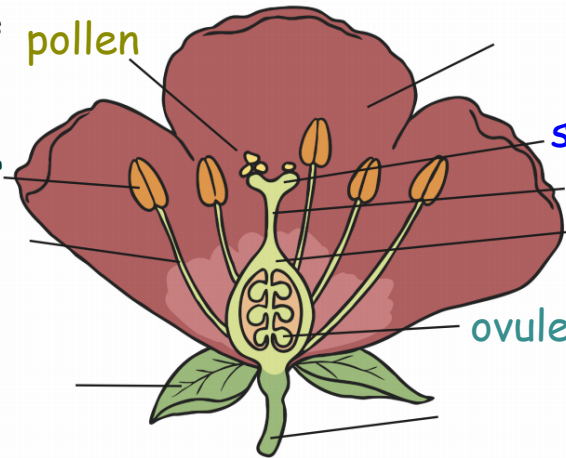
Contains male cells  
(transferred from  
another flower)

pollen



Produces pollen

anther



stigma

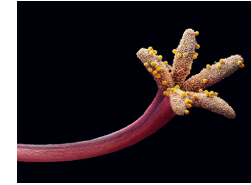
Sticky receptacle for pollen

ovary

Contains the ovules

ovule

Contains the female cells -  
develops into seeds



Once the flower has been pollinated, some of the pollen grains on the **stigma** grow a tube all the way down the **style** and into the **ovary**, where they each deliver a male cell into the ovules. Each male cell then fuses with a female cell in the ovule (**fertilisation**), and a **seed** is then produced. The ovary walls then change to protect the seeds; some become pods, some form shells and others become fruit.

## 5. Seed dispersal



All plants need **light**, **air**, **water** and **nutrients** from the soil to grow well. Ideally, they grow best when there is little competition from other plants, so seeds need to be spread further away (dispersed) to stand a chance of growing healthily.

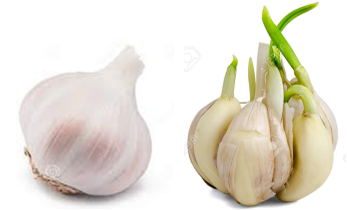


**Do plants need flowers to reproduce?**

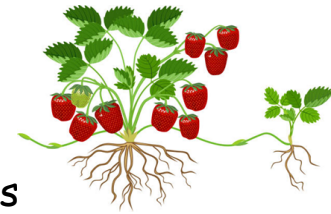


The simple answer is 'no.' Some plants are able to reproduce **asexually** (not combining male and female cells). They can do this using **bulbs**, **runners** or **tubers**.

**Bulbs** are underground food storage organs with fleshy leaves that store food and can grow and develop into new plants, eg onions and garlic.



**Runners** are horizontal stems that then grow roots and start new plants, eg strawberry or spider plants.



**Tubers** are underground food stores. Groups of cells in the tuber use this food to produce the energy needed for cell division. These cells then grow and develop into new plants. Potatoes are the tubers of potato plants.



Because the new plants are formed asexually, without combining male and female cells from two different plants, the new plants are exact copies of the parent plant; they are known as **clones**.

Even more amazingly, plants can also grow new plants from a process called **propagation**. In this process, new plants can grow from cuttings of root, stem and leaf. It's a really common way for gardeners to grow new plants without having to buy or harvest seeds. Again, the new plants are clones of the original plant that the cutting was taken from.



Like plants, animals also have life cycles.

They are born .

They might have  
offspring and  
reproduce

They get older  
.

• They get bigger

Most animals reproduce sexually - they need a male and a female of the species to reproduce.

They might lay eggs.



They might grow offspring inside them.



Can you think of animals which do these?



What about amphibians? How do they reproduce?



Some key vocabulary:

**amphibian**

**metamorphosis**

**gills**

**tadpole**

**spawn**

Can you come up with a definition for these?

Some key vocabulary:

**amphibian** - vertebrates that are typically four-limbed and cold-blooded (body temperatures are regulated by their surroundings); spend part of their lives living in water and part of it on land.

**metamorphosis** - the way some insects and amphibians change in their life. Rather than just growing bigger, they actually change form, like butterflies.

**gills** - the organs that fish, amphibians, and some other animals use to breathe in water. They absorb oxygen dissolved in water into the animal's blood, and allow carbon dioxide to move out.

**tadpole** - a young frog that breathes and lives in the water.

**spawn** - a mass of eggs released into water by a female fish or amphibian.

Before we look at the life cycle of an amphibian, let's get a better understanding of what **metamorphosis** is.

Only insects and amphibians are known to undergo metamorphosis, in which the young form of the animal **completely changes** as it becomes an adult. Watch the metamorphosis of a monarch butterfly caterpillar.



Amphibians are a diverse class of animals, with over 400 different species. They include frogs, toads and newts. Let's look at the frog life cycle.



Can you identify the metamorphosis stage(s) as you watch this video of the life cycle of a frog?

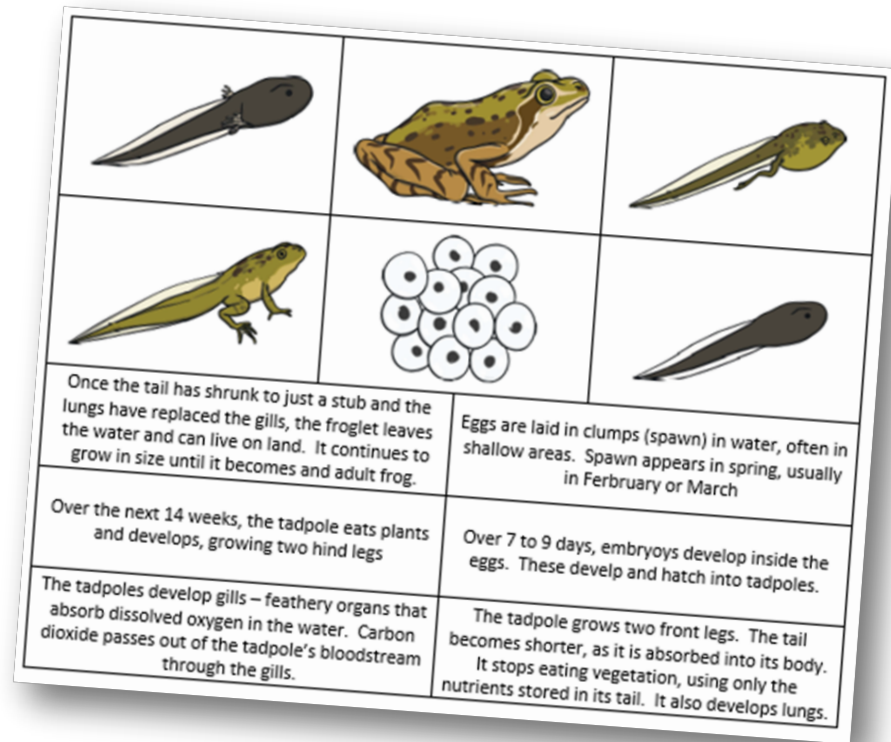
The name amphibian is derived from the Greek *amphibios* meaning "living a double life". Why?

## The Life Cycle of a Frog

Cut out the pictures and descriptions, arrange the pictures as a life cycle diagram, then match the descriptions to them.

Share your ideas with the class, then glue your life cycle into your book.

Can you note which part is to do with metamorphosis?



The only creatures known to undergo metamorphosis are amphibians and insects. Can you list the defining features of insects?



All insects have 6 legs, three body parts (head, thorax and abdomen) and an exoskeleton. Many have wings.





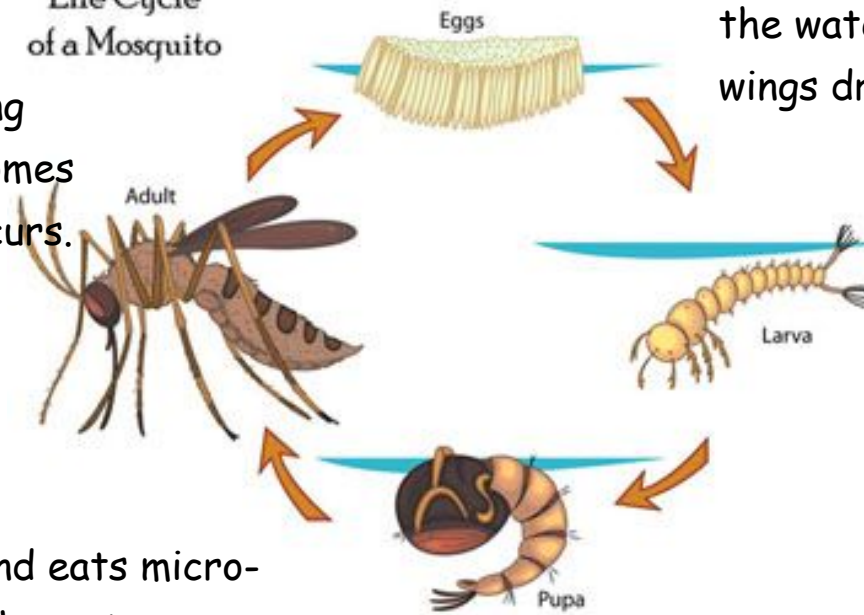
Although all insects undergo metamorphosis, only around twelve percent of them go through **complete metamorphosis** - a change that makes the adult totally different to the young stage. The rest undergo incomplete metamorphosis - there is only a partial change as the insect grows.

The life cycle of a butterfly should already be familiar to you (complete or incomplete metamorphosis? Why?), so let's look at a mosquito's life cycle.

Can you match the descriptions correctly?

After growing and shedding its skin four times, it becomes a pupa. Metamorphosis occurs.

Life Cycle  
of a Mosquito



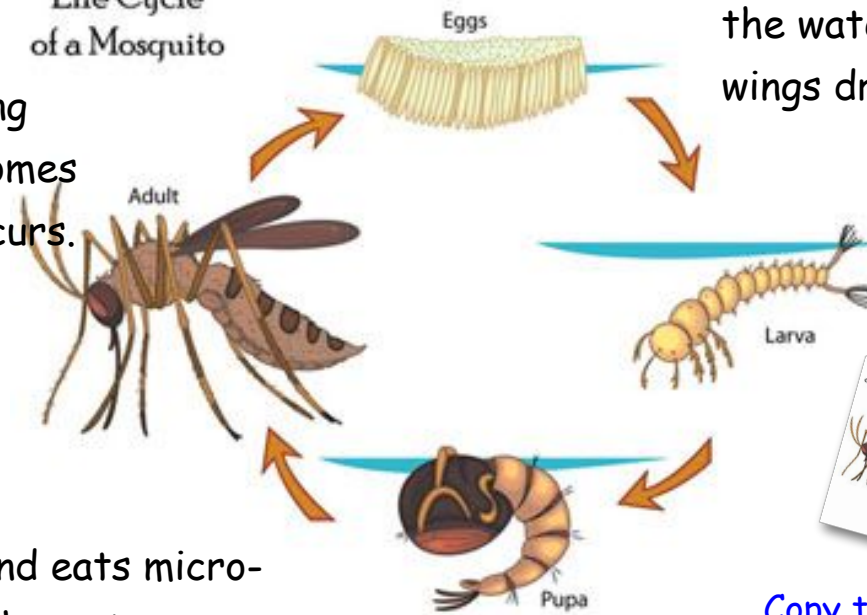
Only four days later, the adult emerges and rests on the water surface until its wings dry and harden.

laid in a 'raft' on water surface

hatches out and eats micro-organisms in the water.

# Life Cycle of a Mosquito

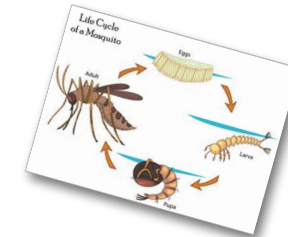
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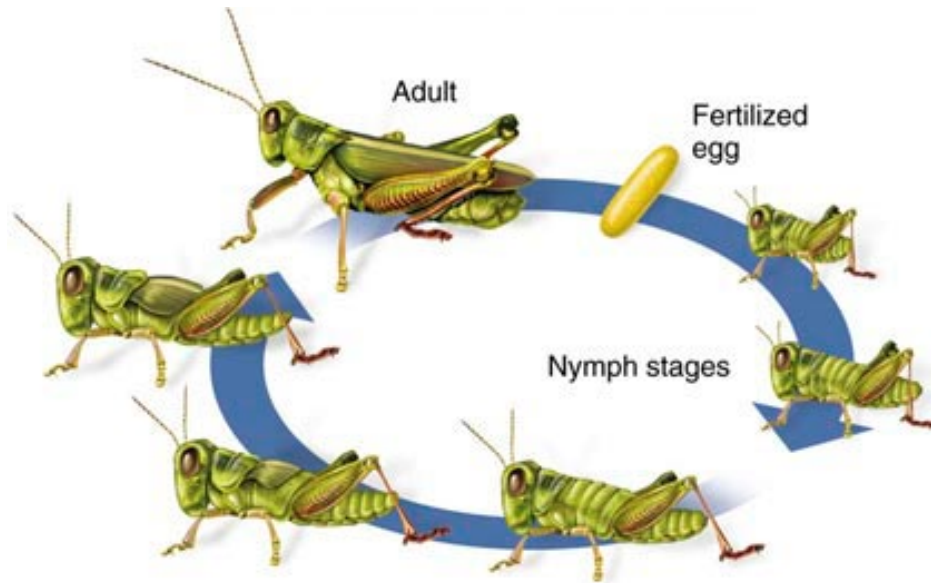
laid in a 'raft' on water surface

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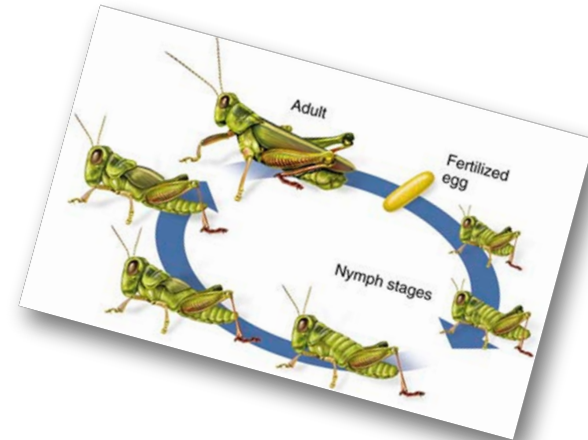


Copy them into the correct places in your book

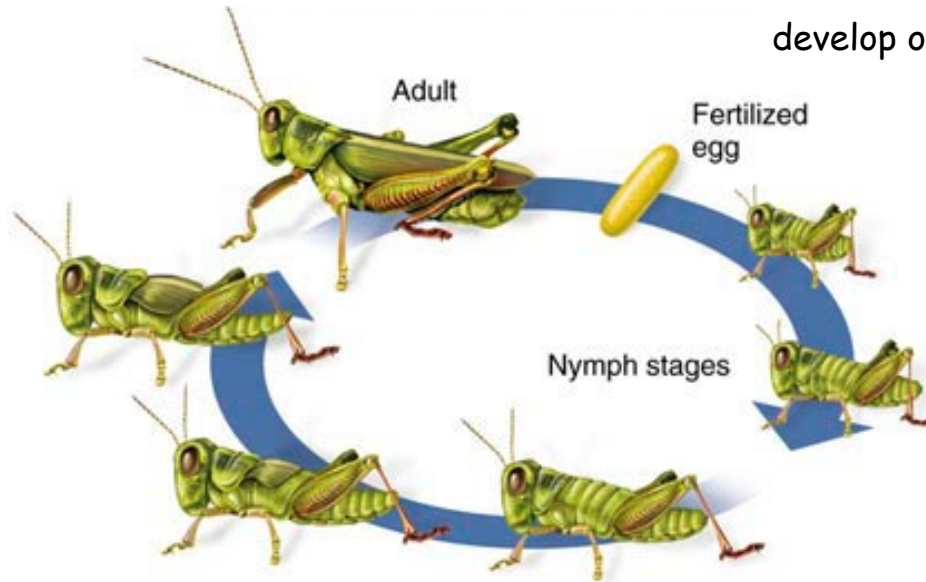
## Incomplete metamorphosis - the life cycle of a cricket.



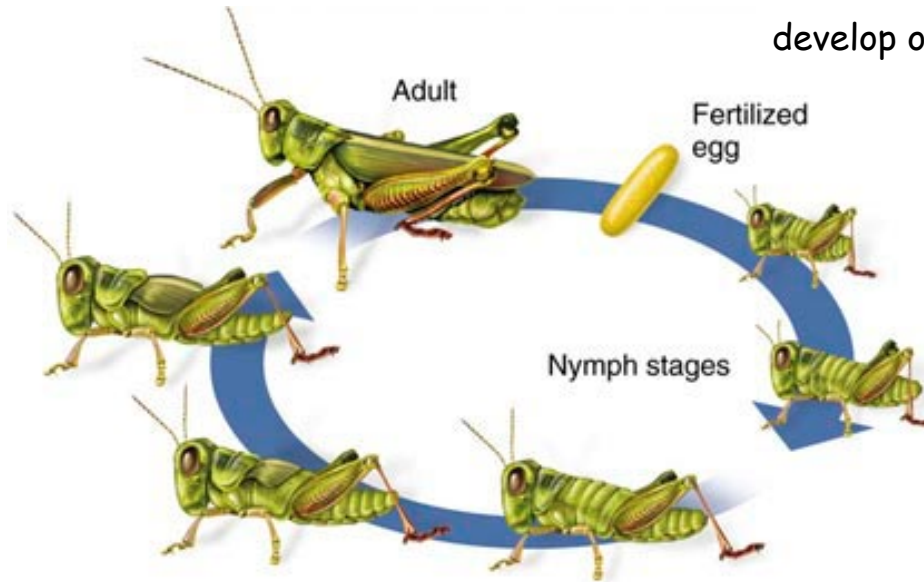
Make notes around your copy



The female lays up to 100 eggs  
in soil or on a plant. Embryos  
develop over 14 days

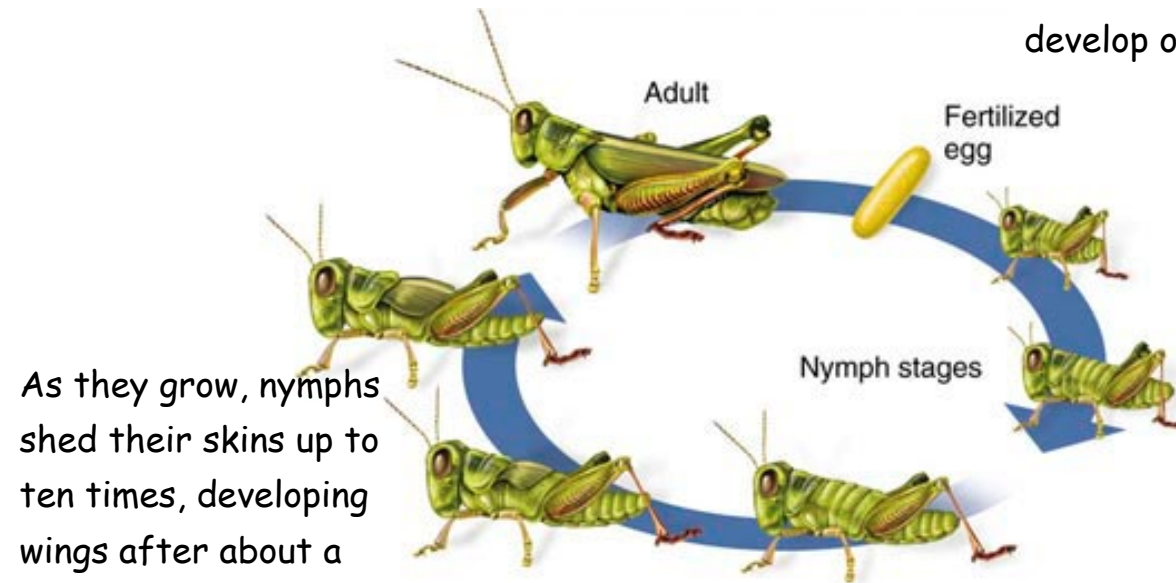


The female lays up to 100 eggs  
in soil or on a plant. Embryos  
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The nymph crickets are very  
small when they emerge -  
about 3mm in length. They look  
like adults, but are not fully  
developed and have no wings.

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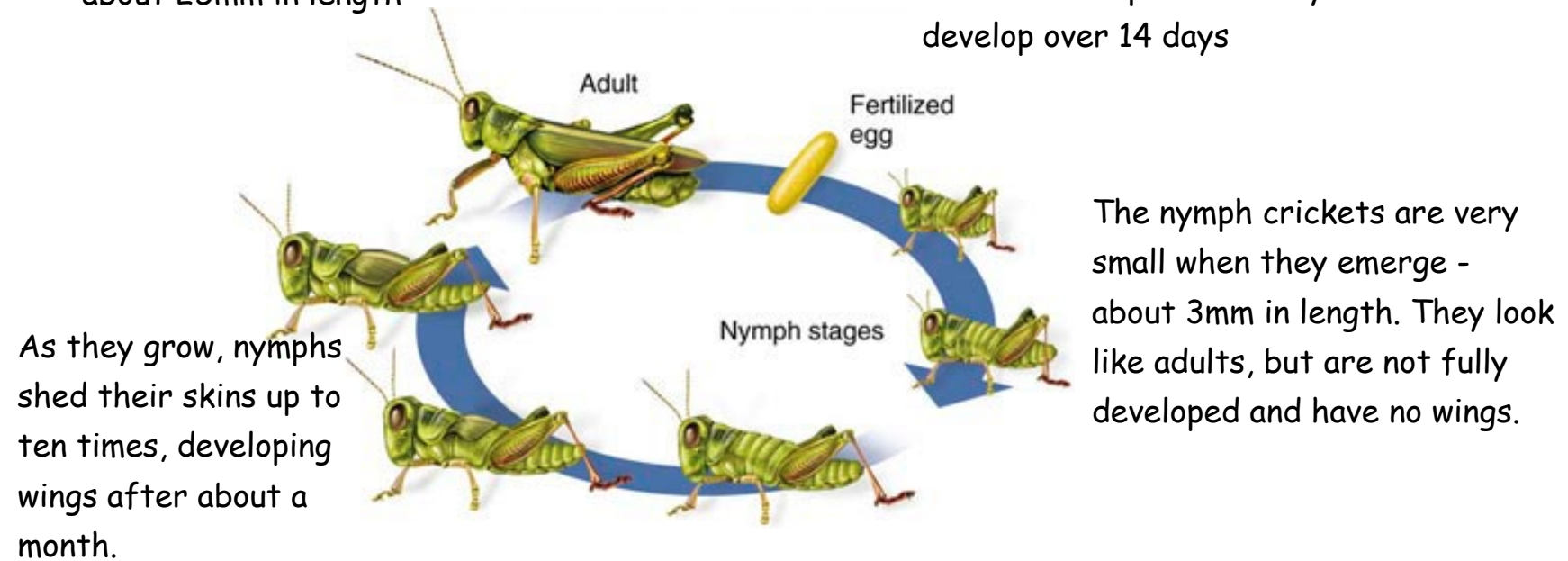


As they grow, nymphs shed their skins up to ten times, developing wings after about a month.

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Adult crickets measure about 25mm in length

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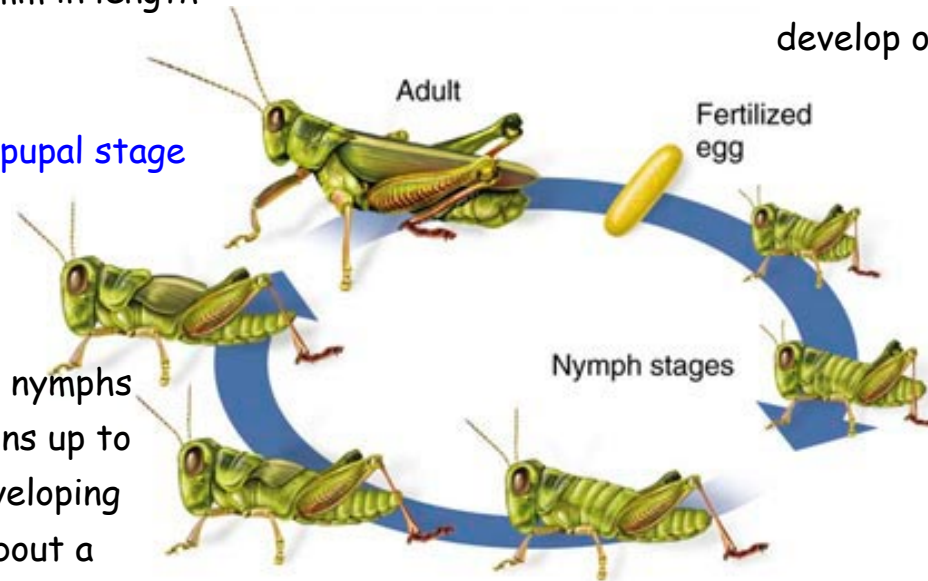
The female lays up to 100 eggs in soil or on a plant. Embryos develop over 14 days

There is no pupal stage

There is no larval stage

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Discuss with a partner: what are the main differences between complete metamorphosis and incomplete metamorphosis?

Discuss with a partner: what are the main differences between complete metamorphosis and incomplete metamorphosis?

Work together to write a sentence or two about this - use both your insect life cycles to help you.

Science skills <b>Explaining Science</b>	Me	Teacher
I use simple science life cycle models to help me compare the life cycles of amphibians and insects**		
I use simple science life cycle models to help me compare and begin to explain the differences between the life cycles of amphibians and insects ***		

Use your Venn diagram sheet to compare the life cycles of amphibians and insects. Think about the similarities as well as the differences. **Finish by writing a short paragraph to link your ideas together - use contrasting and adding conjunctions to help you.**

Science skills **Explaining Science**

	Me	Teacher
I use simple science life cycle models to help me compare the life cycles of amphibians and insects**		
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How are the life cycles of insects and amphibians different and the same?

Insects

Amphibians