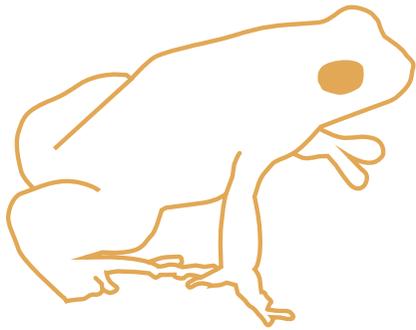


Reproduction for
amphibians and
most insects



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What animal group life cycles have you been learning about?



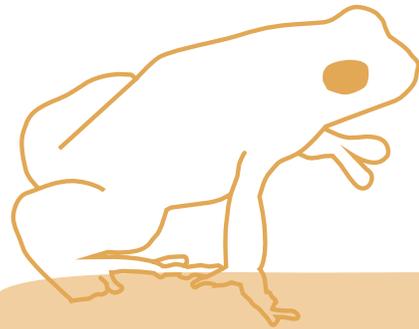
L.O.: To understand how reproduction occurs for amphibians and most insects

Success Criteria:

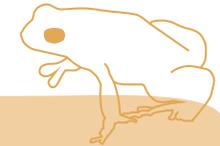
I can:

- Describe how some amphibians reproduce.
- Describe how some insects reproduce.
- Explain how metamorphosis differs between these groups.
- Explain how most amphibian and insect reproduction is sexual reproduction.
- Explain similarities and differences between a rainforest animal and a UK animal.

L.O.: To understand how reproduction occurs for amphibians and most insects



Butterflies and frogs



TO WHICH ANIMAL GROUPS DO FROGS AND BUTTERFLIES BELONG?

- The butterfly is an insect showing complete metamorphosis.



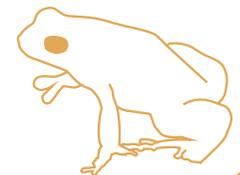
- The frog is an amphibian.

Sorting the life cycle of a frog and a butterfly



L.O.: To understand how reproduction occurs for amphibians and most insects

- Use the worksheet: 'Sorting the life cycle of a frog and a butterfly'.
- Cut out the pictures.
- Use the pictures to create two life cycles, one of the frog and the other of a butterfly.
- Connect the images in to life cycles using arrows (as shown on the Chester Zoo Life Cycle Posters).
- Annotate with as much information that you can remember about frogs, butterflies and the groups to which they belong.



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LIFE CYCLE SORTING OF A FROG AND A BUTTERFLY

Cut out the following pictures. Use the pictures to create the life cycles of a frog and butterfly. Label and annotate your life cycles to show as much information as you can. Think carefully about the animal groups they belong to and write as much information as you can remember.



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Reviewing your work

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THE AMPHIBIAN LIFE CYCLE

EXAMPLES
Frogs, toads, salamanders (e.g. a newt) and caecilians.

After 2 to 4 years it will become an adult and the female can then lay eggs.

YOUNG (JUVENILE) AMPHIBIAN
The juvenile amphibian can live on land.

THE ADULT
This is the animal when it is fully grown and developed.

EGG MASS
They are usually covered in a jelly-like substance, to provide protection and to keep them moist.

After between 2 and 25 days the larva/tadpole hatches from an egg.

EXTRA INFORMATION
Reproduction is usually sexual reproduction. Most salamanders use their sense of smell to find a mate. Frogs use mating calls.

Generally, the female lays a large number of eggs at one time. They often do so in groups, all depositing eggs in the same place at the same time (possibly to ensure some survive). The eggs are generally laid in water but some species may lay them in something else e.g. mud. The eggs are fertilised by the male.

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THE METAMORPHOSIS INSECT LIFE CYCLE

EXAMPLES
Butterflies, beetles, ants, moths, fleas, flies and mosquitoes.

The adult breaks out of the pupa, it then slowly stretches out and relaxes in the sun while its exoskeleton dries out and hardens. The adult can lay eggs.

EGG

EXTRA INFORMATION
Insects that undergo complete metamorphosis are holometabolous insects. In butterflies and moths the pupa is often called a chrysalis.

LARVAE
Insect hatches from an egg in the form of a larva. Larvae vary depending on species; common forms are caterpillars, maggots, grubs.

PUPA
At the end of the larval stage, the insect makes a hard shell (a protective casing) around the larva. It will become a pupa. It stops eating and moving, appearing lifeless. However...

ADULT
This is the adult form of the insect. The winged adult is called an imago.

Metamorphosis is the term for the amazing transformations that take place whilst the insect is a pupa. Inside the pupa, the larva's body completely changes its form into the adult form of the insect.

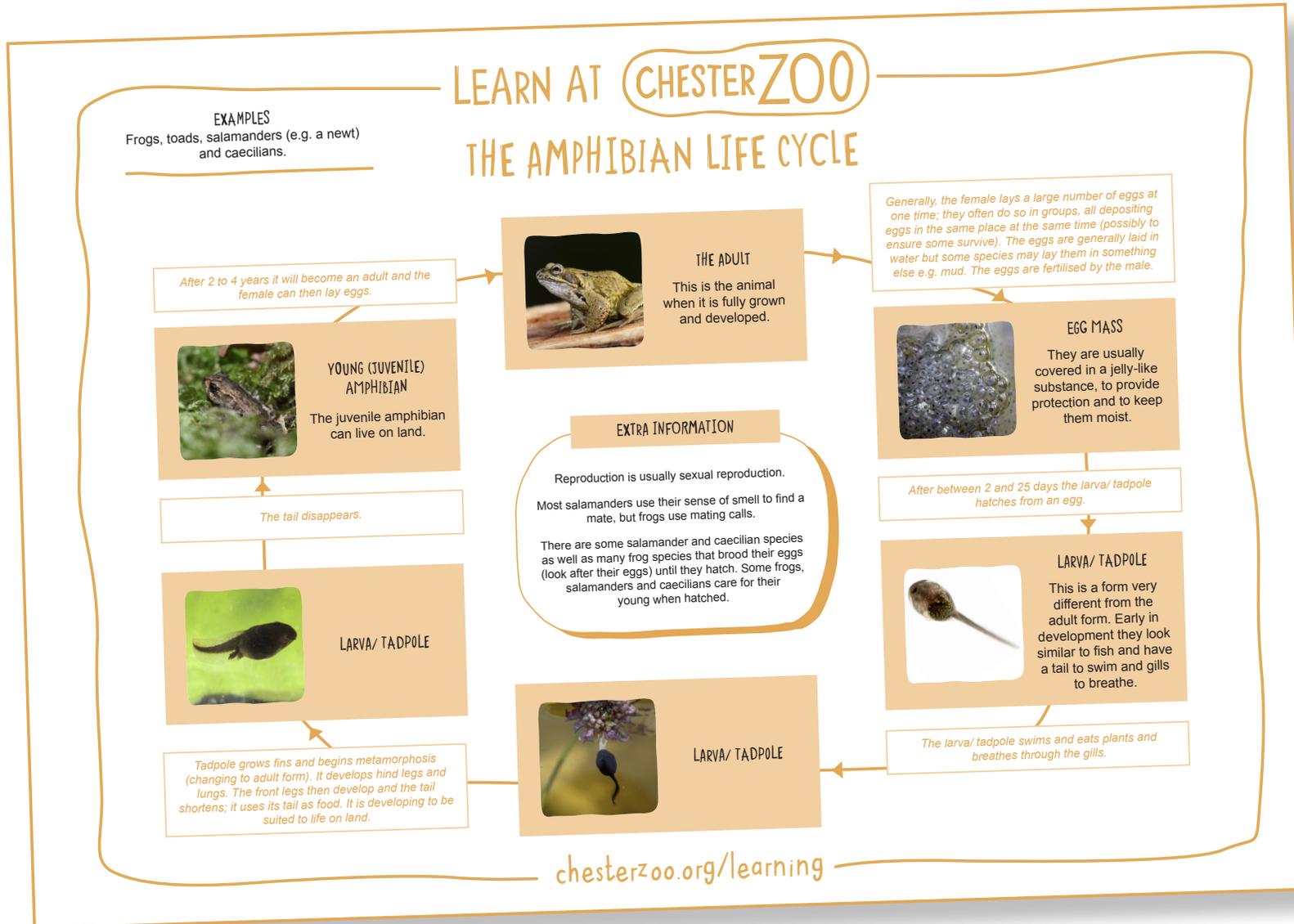
Larvae have huge appetites and can eat several times their own body weight every day. Some larvae add more body segments as they grow.

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- Using the amphibian life cycle poster and the complete metamorphosis of an insect poster (see 'Chester Zoo Life Cycle Posters'), review the life cycles of the frog and the butterfly that you have created.
- Your teacher may allow you to work in pairs.
- Use a different coloured pencil to correct (amend) your labels and annotations, if necessary.
- Your teacher will then review your work with you and you can make further amendments, if necessary.

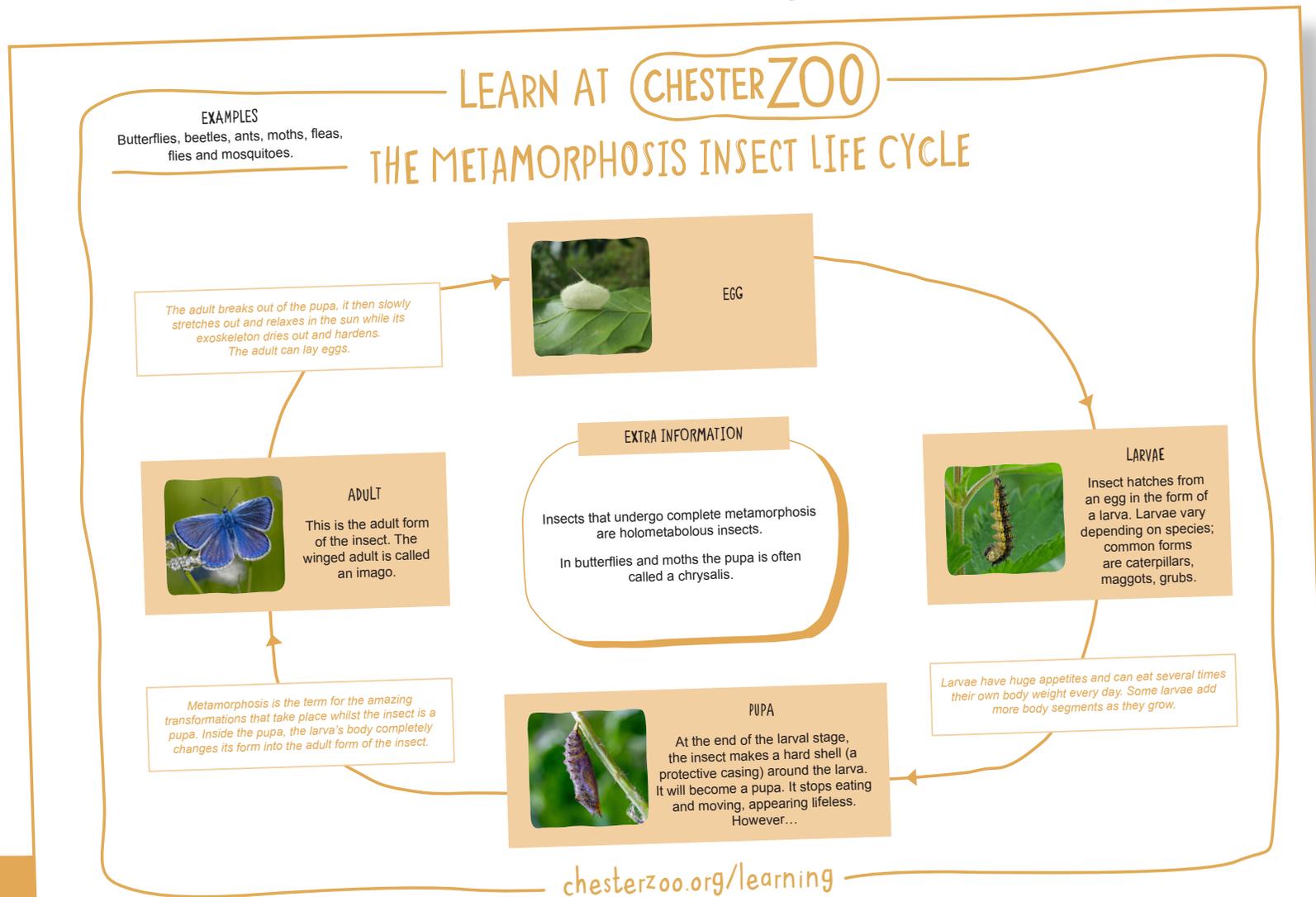
Life cycle of an amphibian

L.O.: To understand how reproduction occurs for amphibians and most insects



Life cycle of an insect showing complete metamorphosis

L.O.: To understand how reproduction occurs for amphibians and most insects



What is sexual reproduction?



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- Almost all animals use sexual reproduction to produce offspring.
- Sexual reproduction requires two parents.
- Male and female cells combine to form one cell, in a process called fertilisation.



Where does fertilisation take place?



L.O.: To understand how reproduction occurs for amphibians and most insects

- Fertilisation can happen outside the body (externally) or inside the body (internally), depending on the species of animal:

OFFSPRING AS A RESULT OF INTERNAL FERTILISATION

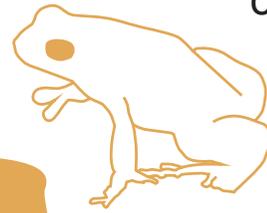


OFFSPRING AS A RESULT OF EXTERNAL FERTILISATION



External fertilisation

L.O.: To understand how reproduction occurs for amphibians and most insects



EXTERNAL FERTILISATION OCCURS FOR MANY ANIMALS THAT LIVE IN WATER.

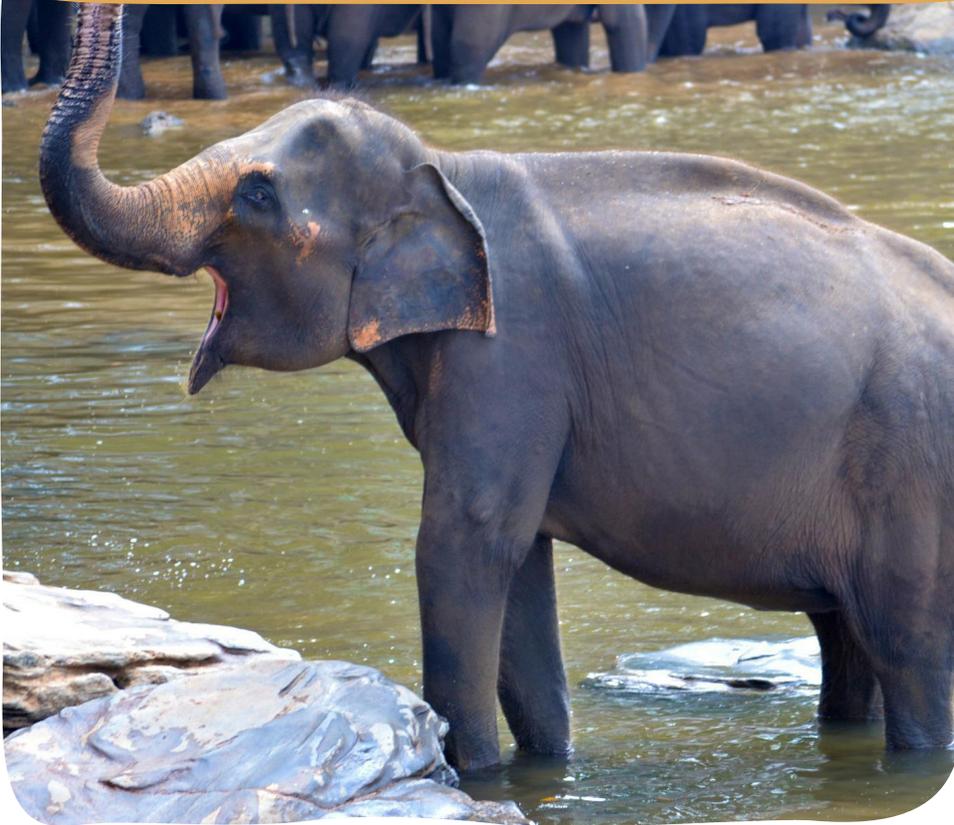
For most species of fish, sperm and eggs are released into the water and some fertilise. Huge numbers are released since sperm and egg are vulnerable and may be eaten by predators or die from harsh environmental conditions e.g. temperature.



Internal fertilisation

L.O.: To understand how reproduction occurs for amphibians and most insects

EXTERNAL FERTILISATION OCCURS FOR MOST ANIMALS THAT LIVE ON LAND AND FOR SOME AQUATIC ANIMALS



Internal fertilisation provides protection from the surrounding environment and from predators; offspring are more likely to survive and fewer offspring are produced.



What are the different forms of internal fertilisation?

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THERE ARE 3 FORMS OF INTERNAL FERTILISATION.

Following internal fertilisation of the egg in the female:

- The offspring develop in the female body and then the young are born alive. (*Most mammals e.g. humans, some reptiles and a few fish*).
- The egg is laid outside the female body and the offspring develop in the egg, until they are ready to hatch. (*Birds*).
- The offspring develop in the female body, the eggs hatch as they are laid, looking like live birth. (*Some fish, some reptiles and some invertebrates*).



Asexual reproduction

L.O.: To understand how reproduction occurs for amphibians and most insects



- There are a few animals that reproduce asexually, without the need for two parents. These are identical to the parents and are clones.

Tasks to compare the reproduction of amphibians and insects

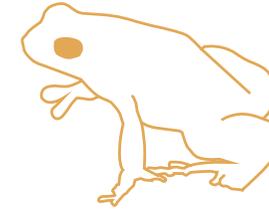
L.O.: To understand how reproduction occurs for amphibians and most insects



- You will be given work in your separate groups, comparing the reproduction of insects and amphibians.

*Comparing the reproduction of an insect and an amphibian

L.O.: To understand how reproduction occurs for amphibians and most insects



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COMPARING THE REPRODUCTION OF AN INSECT AND AN AMPHIBIAN

Name: _____ Date: _____ Class: _____

What is the animal?		
Where does the animal live?		
Where are the eggs laid?		
What happens in metamorphosis? When does it occur?		
Is the reproduction sexual or asexual?		
What is similar about their reproduction?		
What is different about their reproduction?		

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- *Use the worksheet: 'Comparing the reproduction of an insect and an amphibian.'
- You should use the 'Chester Zoo Life Cycle Posters' of amphibians and insects (*showing complete metamorphosis*) to help you to compare insect reproduction with amphibian reproduction.
- You could use a butterfly and a frog as examples in your answers.

**Comparing the reproduction of a specific insect and an amphibian

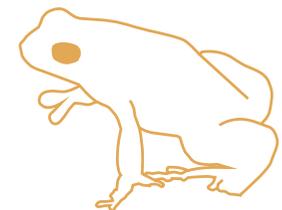
L.O.: To understand how reproduction occurs for amphibians and most insects



- Choose an insect and an amphibian to research. At least one of these should be a rainforest animal from Borneo or Sumatra.
- Use the worksheet: 'Comparing the reproduction of an insect and an amphibian' to compare these animals.
- You could use the 'Chester Zoo Life Cycle Posters' of insects and amphibians to support your work. Also use other resources (e.g. books and the internet).

***Comparing the reproduction of a specific insect and an amphibian

- Choose an insect and an amphibian to research. At least one of these should be a rainforest animal from Borneo or Sumatra.
- Use the worksheet: 'Comparing the reproduction of an insect and an amphibian' to compare these animals.
- You could use the 'Chester Zoo Life Cycle Posters' of insects and amphibians to support your work. (Also use other resources e.g. books and the internet).
- For the animal you have researched who lives in the rainforest, compare with an animal in the same group in the UK.
- Do specific details related to reproduction differ?
- How are the conditions different for survival?



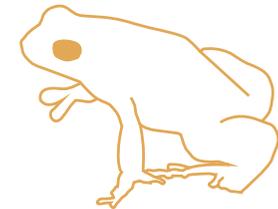
What have you achieved?

L.O.: To understand how reproduction occurs for amphibians and most insects

Success Criteria:

I can:

- Describe how some amphibians reproduce.
- Describe how some insects reproduce.
- Explain how metamorphosis differs between these groups.
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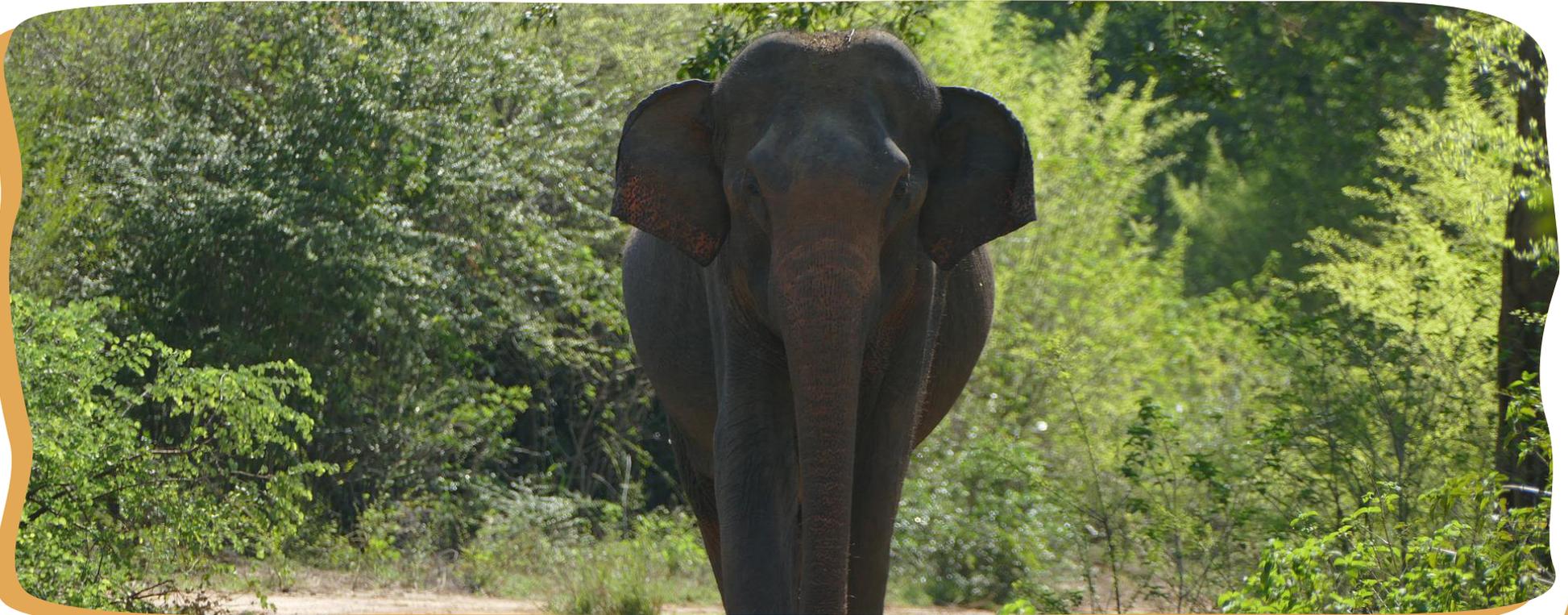
- Review some of the work achieved.
- Review the learning objective and success criteria.

Oil palm plantations



L.O.: To understand how reproduction occurs for amphibians and most insects

Insects and amphibians have decreased as a result of oil palm plantations. However, the planting of other crops for oil would cause **greater loss of rainforest and animal diversity...**



Oil palms produce **more** vegetable oil per land area than any other oil crop

So *less land* is needed to create the same quantities than other oil crops.
Sustainable palm oil practice means *FEWER rainforests* are at risk from being destroyed to make more plantations.

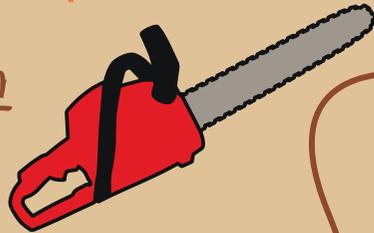
Have a look at the comparison of **how many litres of oil** is produced per hectare for the most common vegetable oils...



Sustainable oil palm plantations

Sustainably produced palm oil **must** meet certain criteria

Rainforests aren't cut down
for new plantations



Plantation owners follow best practice
to make the plantation *efficient* and reduce the
impact on the environment

Workers are cared for
and given *proper wages and rights*



No new planting on peatlands
and all peatlands are managed responsibly

Wildlife corridors are kept
to connect *fragmented* species

