



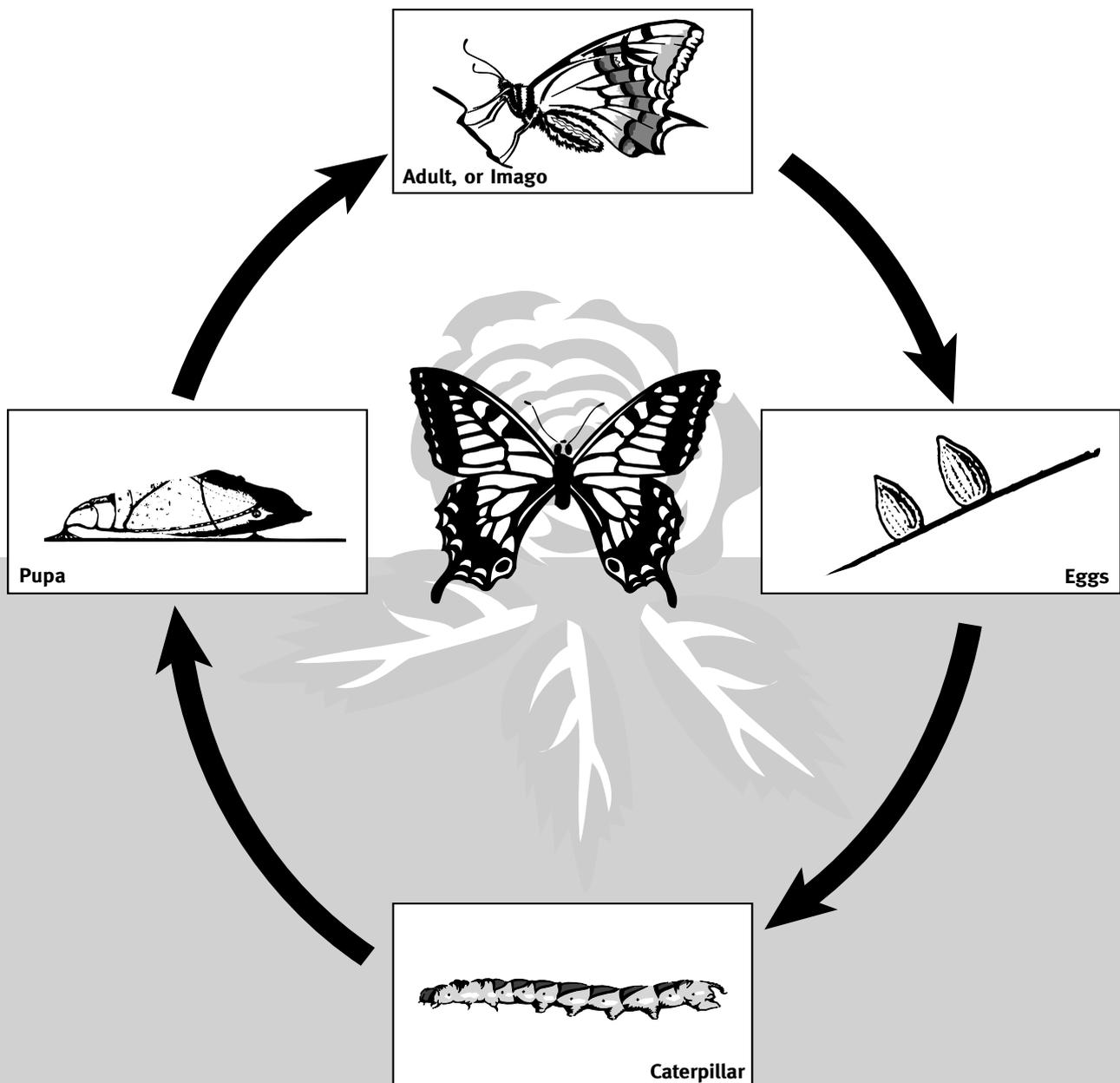
Looking at life cycles

Using a selection of the Discovery cards in this section, children can learn more about insect lifecycles and how to sequence the lifestages of a butterfly correctly. They can also explore metamorphosis.

Butterflies and moths don't begin life as flying insects. They start out as caterpillars, and, as they grow up, their bodies go through a complete change, known as **complete metamorphosis**.

The life cycle of a butterfly has four separate stages:

- First, the adults lay **eggs** on leaves.
- When an egg hatches, a **caterpillar** comes out. The caterpillar feeds on leaves and grows until it is ready to turn into a **pupa**. The pupa of a butterfly is often called a **chrysalis**.
- The body of the butterfly then develops inside the pupa.
- When at last an **adult butterfly** emerges, it flies off to look for a mate, and the cycle starts all over again.





For comparison the life cycle of a locust is shown below. The locust life cycle is an example of **incomplete metamorphosis**.

Possible activities

- Using **Discovery sheet 6a - the life stages of a butterfly**, children can cut out and sequence the life stage illustrations and stick them into the correct boxes **or** they might draw their own pictures of each life stage in the boxes (**suitable for 5 - 7 year olds**).
- Using **Discovery sheet 6b - the lifecycle of a butterfly** children can draw in the butterfly lifecycle and label their diagram (**suitable for 7 - 12 year olds**).
- Using **Discovery sheet 6c - lifecycles** children can identify the correct lifecycle sequence and complete two different lifecycles (**suitable for 7 - 12 year olds**).

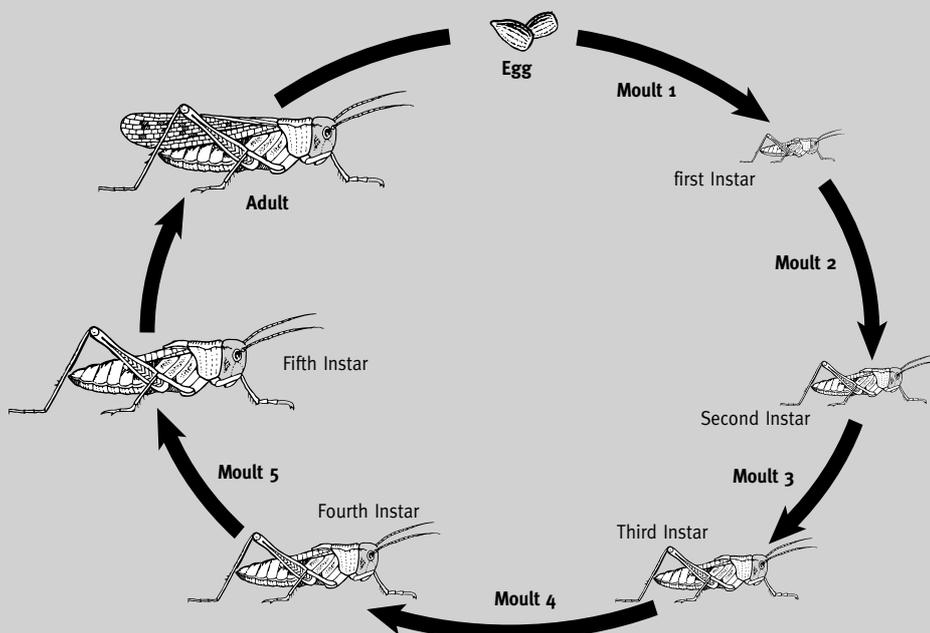
Extension activities

1. Select two invertebrates and discuss with the children how each is adapted to its habitat and its way of life. You might try brainstorming as a whole class exercise to generate ideas. You might also use the Minibeast Wallchart and fact file as a basis for discussion (**suitable for 5 - 7 year olds**).
2. Give the children an open-ended problem-solving task (**suitable for 11 - 12 year olds**). For example you might set the following scene: a group of explorers have just come back from the Amazon rainforest.

They claim that while they were there they discovered a giant leaf-eating beetle. They say that this amazing insect was **100** times bigger than an average beetle. Do you think they are telling the truth? Could a beetle of this size really exist somewhere on earth?

In order to answer this question, children will have to find out all they can about beetles, their body structure, diet and habitat. They will also have to consider size and volume.

Note: The exoskeleton is a very efficient means of support for a small organism. But as arthropods become larger, their volume and body mass increase in proportion to the cube of their linear dimensions. This means that the exoskeleton must become very much heavier and thicker in order to remain effective. There is no solution to this mechanical problem and it limits the size of **terrestrial** arthropods to around 10 -15 cm in any direction. Aquatic arthropods like the Japanese Spider Crab get support from the water around them and so they can be bigger than terrestrial arthropods. The heaviest insects in the world are goliath beetles. They can weigh up to 100 g and reach the size of a tennis ball.



Locusts develop their adult form gradually, without any sudden change in body shape. This is called incomplete metamorphosis.

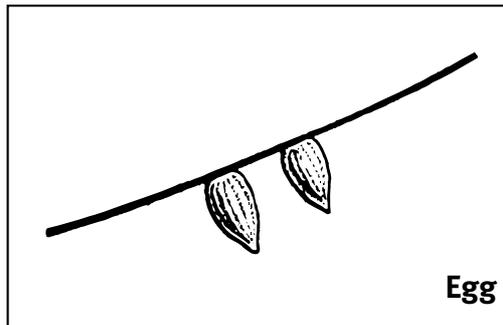
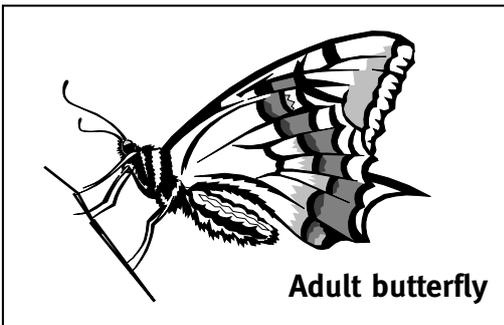
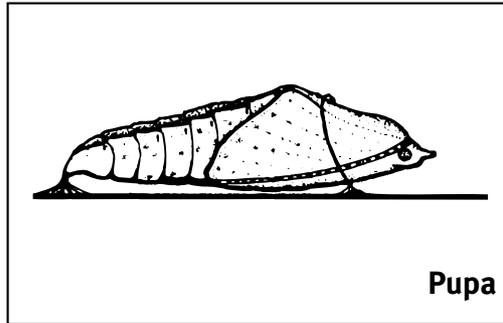
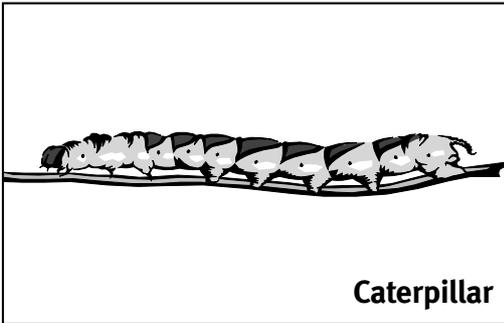
Locusts lay eggs in damp, warm soil or sand. After around 10 days young locusts, called nymphs, emerge. These nymphs have large heads. They do not have wings, only wing buds but otherwise they look like smaller versions of the adult.

As the nymphs grow, they shed their skins or moult. After the fifth moult they are mature adults with fully formed wings and sexual organs.



Name: _____

Put the pictures below in the correct order



The correct order of the life stages of a butterfly is:

1

2

3

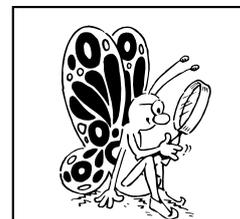
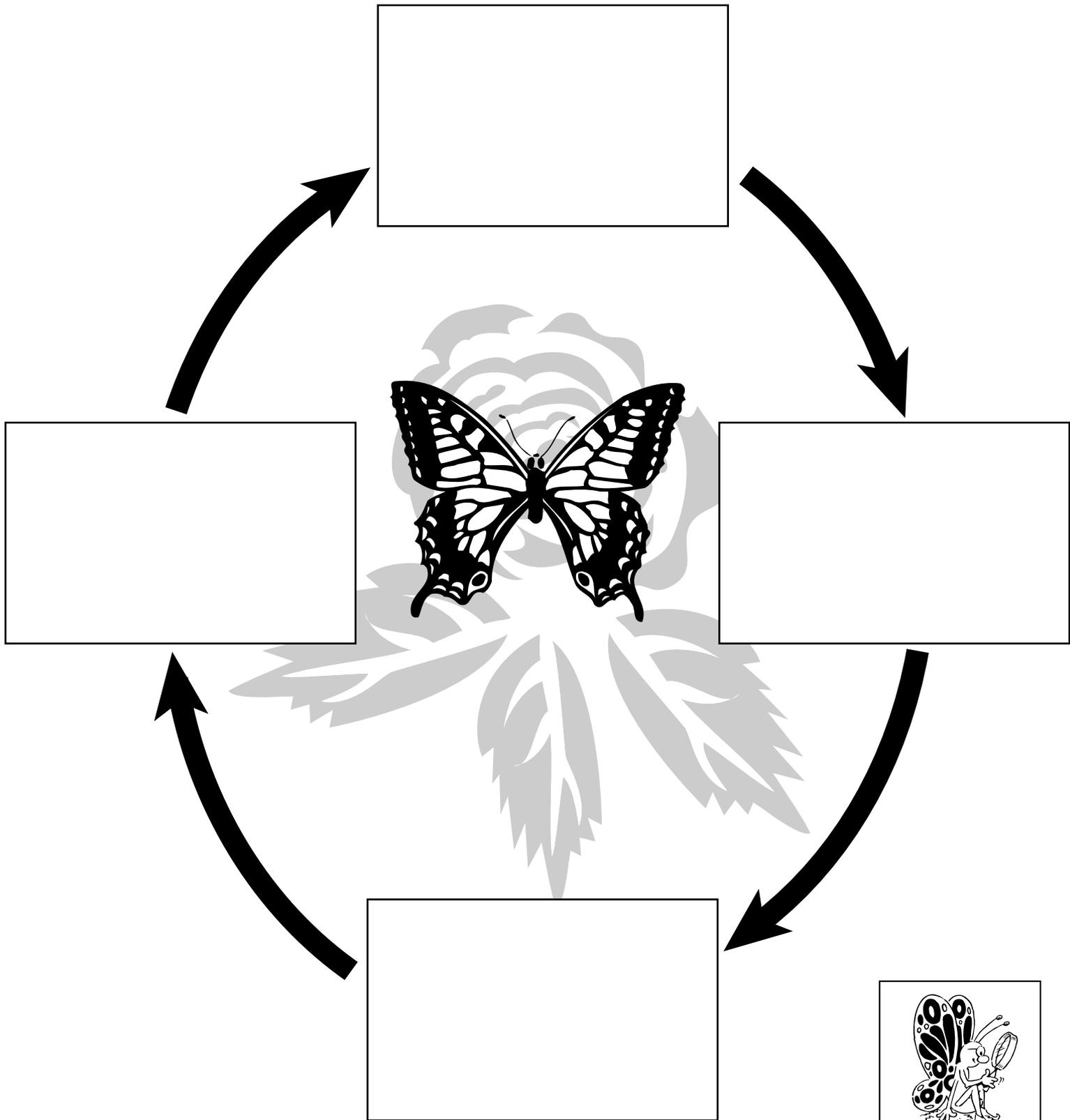
4



The life cycle of a butterfly



Name: _____



Life cycles

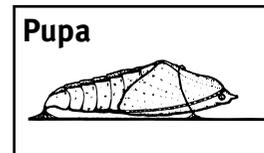
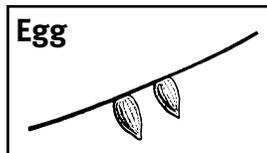
Name: _____

The butterfly changes through complete metamorphosis.
Which sentence is correct?

	Yes	No
butterfly → egg → caterpillar → pupa	<input type="checkbox"/>	<input type="checkbox"/>
egg → caterpillar → pupa → butterfly	<input type="checkbox"/>	<input type="checkbox"/>
caterpillar → egg → butterfly → pupa	<input type="checkbox"/>	<input type="checkbox"/>
pupa → butterfly → caterpillar → egg	<input type="checkbox"/>	<input type="checkbox"/>

Complete the life cycles below:

The butterfly



The locust

