

# Worksheets

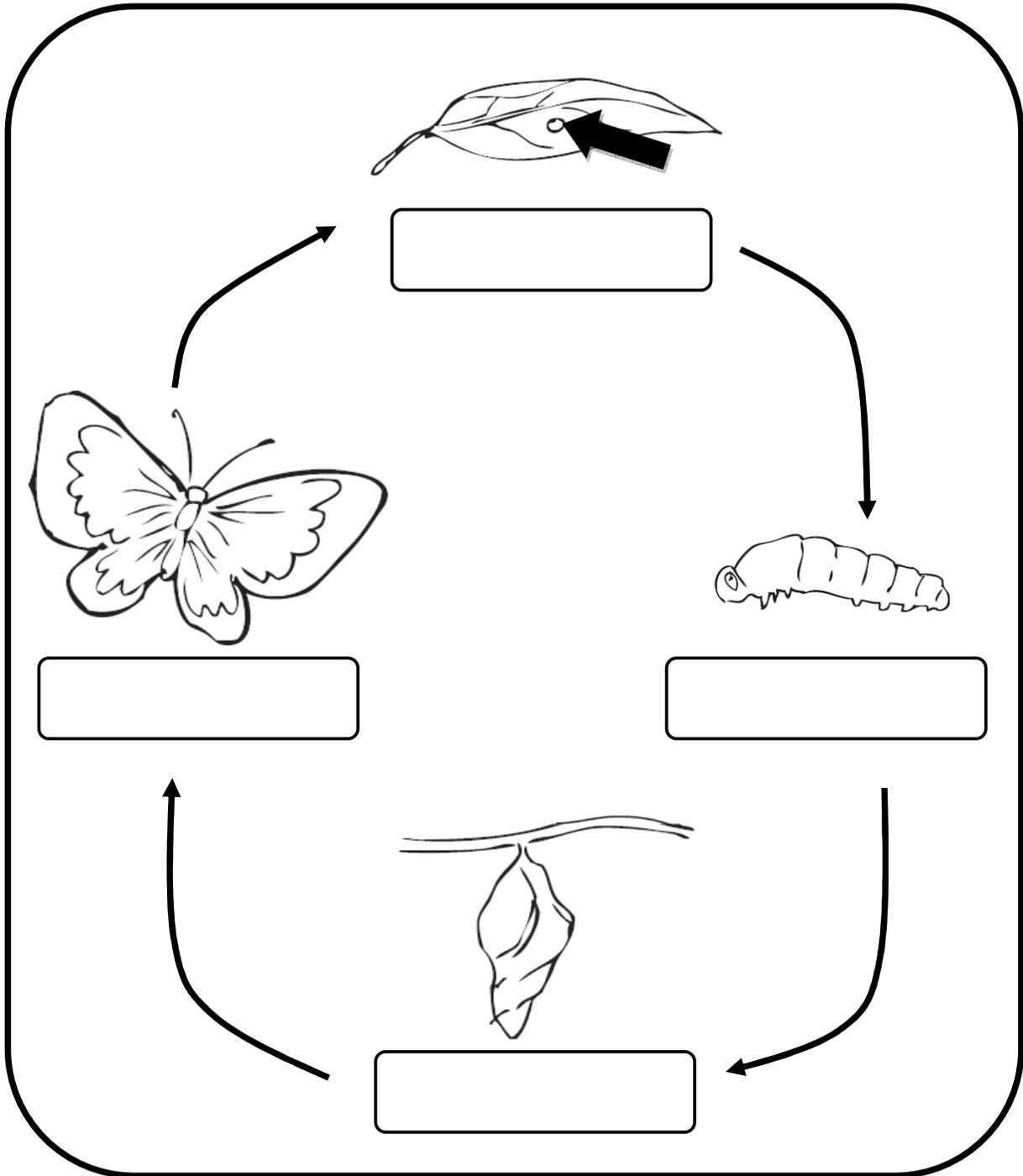
## (Caterpillars of Singapore's Butterflies)

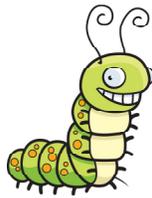
Worksheet	Title	Recommended level
1	Life cycle of a butterfly	P3
2	Am I an insect?	P3
3	Adaptations of the caterpillar - defence mechanism	P6
4	The butterfly and its ecosystem	P6 and lower sec
5	Caterpillar identification	General

# Life cycle of a butterfly

Name: \_\_\_\_\_ ( ) Class: \_\_\_\_\_ Date: \_\_\_\_\_

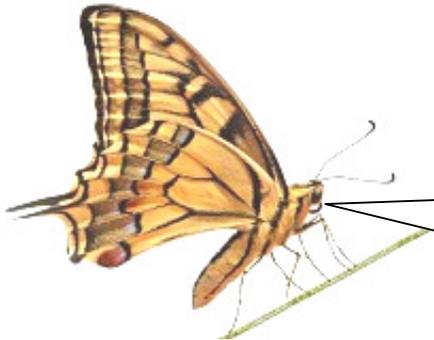
Name the four stages in the life cycle of a butterfly.





# Am I an insect?

Name: \_\_\_\_\_ ( ) Class: \_\_\_\_\_ Date: \_\_\_\_\_



An insect has \_\_\_ body parts: head, thorax and abdomen.

It has \_\_\_ legs coming out from its thorax.

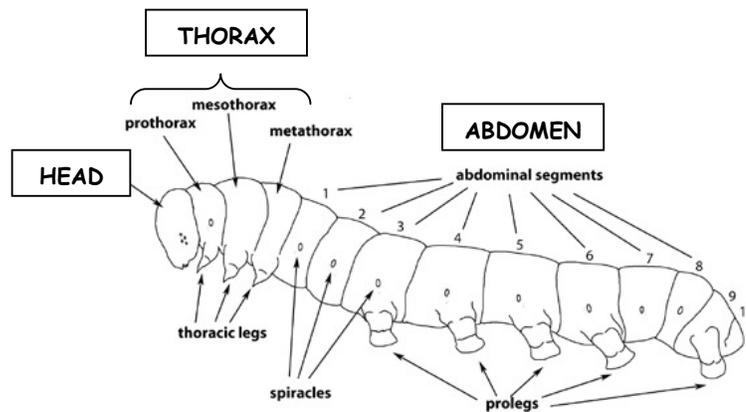
I have these characteristics, so I am an insect!

I don't look like you, Mummy. What am I? Am I a worm or an insect?



Help the mother butterfly explain to the caterpillar by filling in the blanks with helping words from the box below:

prolegs                  real                  insect                  different                  many



My dear caterpillar, you are an \_\_\_\_\_ like me! You look \_\_\_\_\_ because it seems that you have \_\_\_\_\_ legs. But if you look carefully, you will see that you have two different types of legs. Just behind your head (on your thorax) you have 3 pairs of legs which are the real legs. These are called the thoracic legs, and they have joints and small claws at their ends. The other legs which you see at your rear (on your abdomen) are not \_\_\_\_\_ legs. These are called the \_\_\_\_\_, and are quite fleshy and have no visible joints.

# Adaptations of the caterpillar – defence mechanism

Name: \_\_\_\_\_ ( ) Class: \_\_\_\_\_ Date: \_\_\_\_\_

All butterfly species have defensive mechanisms against predators and parasitoids in both the egg and caterpillar stages. Many predators feed on caterpillars as they are a rich source of protein. As a result, caterpillars have evolved various means of defence.

State whether the following defensive mechanisms are structural or behavioural adaptations (or both) and how these adaptations help the species to survive.

## (A) Egg Stage

	Mechanism	Type of adaptation (structural/ behavioural)	How does this adaptation help the species in its survival?
1	The egg takes the same colour as the substrate (or the leaves) that it is laid on, or resembles the plant parts in the vicinity.		
2	The mother butterfly lays the egg in a tight space between leaves or flower buds within a gelatinous matrix, or in a mess of hair that is glued to the egg.		
3	The mother butterfly lays eggs in clusters.		
4	The mother butterfly stands guard over its cluster of eggs for days until they hatch.		

**(B) Caterpillar Stage**

	<b>Mechanism</b>	<b>Type of adaptation (structural/ behavioral)</b>	<b>How does this adaptation help the species in its survival?</b>
1	The caterpillar feeds on plants with toxic chemicals and stores these toxins in its body. The caterpillar is unaffected by the toxins, but a predator will be poisoned if it eats the caterpillar.		
2	The caterpillar has patterns or prominent spines which warn predators of its toxicity.		
3	The caterpillar constructs a leaf shelter in which to rest in-between feeds.		
4	The caterpillar forcefully catapults its frass pellets (waste) away from its resting or feeding site.		
5	The caterpillar produces brightly-coloured structures on its body (by turning out specialised glands), and emits a strong scent when a predator appears.		

6	The caterpillar possesses nectary glands that attract the attendance of ants.		
7	The caterpillar's body colour and markings match the plant part it is feeding or resting on (such as thorns). It can even mimic objects in the environment, such as bird droppings.		

# The Caterpillar and its impact on the ecosystem

Name: \_\_\_\_\_ ( ) Class: \_\_\_\_\_ Date: \_\_\_\_\_

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## *Case Study:*

When the population of Caterpillar Species X suddenly increases in Forest A, the birds that feed on the caterpillar are affected. For instance, the increased population of caterpillars may heavily defoliate the trees on which they live, in turn exposing any bird nests that are located on the trees. The defoliation may also affect the temperature and humidity of the forest.

- (a) Explain how the population of birds will be positively affected by the increase in the number of Caterpillar Species X.

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- (b) Explain how the population of birds will be negatively affected by the increase in the number of Caterpillar Species X.

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- (c) How do you think the temperature and humidity of the forest may be affected when the trees are heavily defoliated? Will this impact the animals in the forest?

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# Caterpillar identification

Name: \_\_\_\_\_ ( ) Class: \_\_\_\_\_ Date: \_\_\_\_\_

Have fun matching these caterpillars to their names!

Plain Nawab	•	•	
Blue Spotted Crow	•	•	
Lime Butterfly	•	•	
Plain Tiger	•	•	
Painted Jezebel	•	•	
Chocolate Pansy	•	•	
Common Birdwing	•	•	

