Before They Fly

Use life cycle evidence to distinguish two patterns of insect development.

ZOO.5.7 "Differentiate between complete and incomplete metamorphosis in insects' life cycles."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each insect's immature stages, circle every mention of a pupa or its absence, and number the stages in order. Use your marks to compare complete and incomplete metamorphosis.

What Happens Before Adulthood?

1. On a warm evening, a mosquito lays eggs on still water. The eggs hatch into swimming larvae that feed in the water. Each larva later becomes a pupa, a stage that does not feed. Inside the pupa, the mosquito's body changes greatly before a winged adult emerges. This sequence, egg, larva, pupa, adult, is complete metamorphosis. The larva has a different body form and habitat from the flying adult. A person watching only the adult near the pond might miss the two very different immature stages below the surface.

2. In a grassy field, a grasshopper begins as an egg in the soil. It hatches as a nymph, a small grasshopper-like insect without fully developed wings. The nymph eats plants and sheds its outer covering several times as it grows. Wing buds appear and enlarge through later nymph stages; the adult has working wings. This egg, nymph, adult sequence is incomplete metamorphosis. There is no pupal stage. Unlike a mosquito larva, a grasshopper nymph already resembles its adult form, although its size, wings, and ability to reproduce still change.

3. The same clues help when observing other insects. A ladybug begins as an egg, then becomes a long, spiny larva that eats other insects. It forms a pupa before emerging as a rounded adult. A cricket, by contrast, hatches as a nymph shaped much like a small adult cricket. It molts as it grows, but it never enters a pupa. Both adults may have wings, so wings alone do not tell which pattern occurred. To classify a life cycle, look for the immature body's form and check whether a pupal stage separates larva from adult.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do the immature forms of a mosquito and a grasshopper differ in their resemblance to the adults?

2. Which stage occurs between larva and adult in a mosquito but has no counterpart in a grasshopper's life cycle? How does that difference affect each classification?

3. Classify the ladybug's and cricket's metamorphosis. Give one stage from each life cycle that supports your classifications.

4. Why would seeing only winged adult insects be insufficient to tell whether they had complete or incomplete metamorphosis?

3 YOUR TURN

Your own words

Invent two insects, one with complete metamorphosis and one with incomplete metamorphosis. In four to six sentences, name each insect's stages in order and describe one change in its body that shows why its life cycle fits that pattern.

Before They Fly

PART 1 · READ AND MARK

Underline each insect's immature stages, circle every mention of a pupa or its absence, and number the stages in order. Use your marks to compare complete and incomplete metamorphosis. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do the immature forms of a mosquito and a grasshopper differ in their resemblance to the adults?	**A mosquito larva has a different body form from the adult. A grasshopper nymph already resembles a small adult grasshopper.**
2	Which stage occurs between larva and adult in a mosquito but has no counterpart in a grasshopper's life cycle? How does that difference affect each classification?	**The pupal stage occurs in the mosquito but not the grasshopper. The mosquito has complete metamorphosis, while the grasshopper has incomplete metamorphosis.**
3	Classify the ladybug's and cricket's metamorphosis. Give one stage from each life cycle that supports your classifications.	**The ladybug has complete metamorphosis because it forms a pupa. The cricket has incomplete metamorphosis because it develops as a nymph and never enters a pupa.**
4	Why would seeing only winged adult insects be insufficient to tell whether they had complete or incomplete metamorphosis?	**Adults from either pattern may have wings. You need evidence of the immature stages, especially whether the insect had a pupa.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

My invented marsh skimmer has complete metamorphosis: egg, larva, pupa, adult. Its worm-shaped larva becomes a pupa before emerging as a winged adult with a different body form. My invented stone hopper has incomplete metamorphosis: egg, nymph, adult. Its nymph looks like a small adult, and its wing buds grow through several molts without a pupal stage.

Accept different invented insects if their stages are in the correct order and their body changes fit the stated type. A complete life cycle must include a pupa; an incomplete life cycle must not.