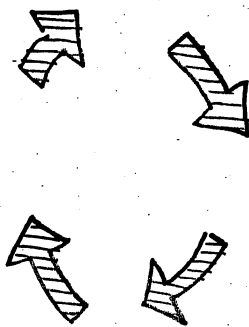


Growing up

# metamorphosis

place the growing up images for the monarch butterfly or cecropia moth in the correct order.

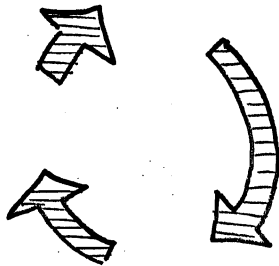


Why did you pick this order?

cecropia moth  
monarch butterfly

think and search question

place the growing up images for the praying mantis or lady bug beetle in the correct order.



Standards 52e, 52f, 56a, 56b, 56d, 57a, 57c, 57d, 57e

Our goal is to understand complete and incomplete metamorphosis - change in form



# life cycle

Complete metamorphosis

incomplete metamorphosis

How is complete metamorphosis different from incomplete metamorphosis?

think and search question

### Growth and Development

After an insect hatches, it follows one of three patterns of growth and development, depending on its species. The simplest pattern occurs in a few kinds of primitive wingless insects, including silver fish and springtails. When these insects hatch, they look exactly like their parents, except for size. The young insects live in the same surroundings and eat the same food in the same way as the adults. They grow to adulthood by splitting out of it. After the insects reach a certain size and their reproductive organs have fully developed, they can mate. From the time they hatch until they die, these insects change little, except to grow larger.

Other insects have a far different pattern of growth and development. The young look different from their parents, and are called nymphs or larvae. This change is called *metamorphosis*. An insect goes through one of two types of metamorphosis, incomplete or complete.

Incomplete Metamorphosis occurs in such insects as grasshoppers, may flies, roaches, damselflies, dragonflies, cicadas, and chinch bugs. These insects pass through three stages: (1) egg, (2) nymph, and (3) adult.

Among such insects as grasshoppers and chinch bugs, the nymphs look much like their parents, except that they have no wings. The wings first appear as little pads after the insect has shed its exoskeleton a few times. With each molt, the wings enlarge. After the last molt, the adult comes out with its wings fully developed. The nymphs usually live in the same places and eat the same food as the adults.

Among dragonflies and damselflies, the nymphs differ greatly from their parents. The adults are beautiful winged insects that spend much of their

live in flight. The wingless nymphs live in water and breathe by means of gills. The nymphs are often called *nymphs*. After they reach full growth, they crawl out of the water onto a plant stem or rock. They then shed their shells for the last time and become winged adults.

**Complete Metamorphosis** takes place in most species of insects, including butterflies, moths, bees, flies, bees, wasps, and ants. These insects go through four stages: (1) egg, (2) larva, (3) pupa, and (4) adult. The larvae of these insects are wormlike creatures that look completely different from their parents. Among many species, the larvae live in different places and eat different foods. They do not have their parents' compound eyes and wings. Most of them have chewing mouth parts, though their parents may have sucking mouth parts. Some larvae have no legs. Others may have many extra leg like structures on the abdomen. The larvae of many species have special names. For example, the larvae of butterflies and moths are called caterpillars; those of flies, mosquitoes, and beetles, grubs; and those of mosquitoes, wigglers. Larvae simply eat and grow, molting several times as their skin becomes too tight. In one day, a caterpillar may eat several times its weight in leaves.

After a larva completes its growth, it stops eating. It then becomes a pupa. In preparation for this stage, some larvae spin a cocoon or form some other protective covering around their bodies. Most pupae lie quietly and appear lifeless. But inside the protective covering there is great activity. The larval structures are being broken down—largely into a liquid—and re-formed in to adult organs. After the change is complete, the pupal covering cracks open and the adult insect crawls out.

define- nymph-

larvae-

these images are available on our web site



sally

life cycle