

METAMORPHOSIS

REPRODUCTION

Sexual ♂+♀

Most animals reproduce via **SEXUAL REPRODUCTION**, such as butterflies & moths. Once female butterflies mate with male butterflies, the eggs become fertilized and then the miraculous phenomenon of **DEVELOPMENT** begins...

WHAT IS DEVELOPMENT?

The process by which an animal completes its life cycle, going from an egg to a mature adult that can reproduce and continue the cycle.

WHAT IS METAMORPHOSIS?

The developmental process of an organism from an immature form to an adult form through distinct life stages.

WHAT IS COMPLETE METAMORPHOSIS?

- A type of metamorphosis in which the organism goes through 4 **distinct life** stages that differ from each other; 1) the egg, 2) the caterpillar (or larvae), 3) the pupa, and 4) the adult.
 - The caterpillars molt their skin a number of times before becoming a pupa; the phases between the molts are referred to as **instars**.

BUTTERFLY LIFE CYCLE

DO YOU REMEMBER THE
STAGES OF THE
BUTTERFLY
LIFE CYCLE?



BUTTERFLY LIFE CYCLE

DO YOU REMEMBER THE
STAGES OF THE
BUTTERFLY
LIFE CYCLE?

Egg



Caterpillar



Butterfly

Chrysalis



BUT NOT ALL INSECTS
UNDERGO COMPLETE
METAMORPHOSIS

MANY INSECT DEVELOP VIA
INCOMPLETE
METAMORPHOSIS

WHAT IS INCOMPLETE METAMORPHOSIS?

- A type of metamorphosis in which the organism goes through 3 gradual stages 1) the egg 2) the nymph and 3) the adult.
 - The nymphs hatch out of the egg looking like small adults, then go through a series of molts, getting larger each time until they are a full grown adult.
 - The number of molts varies between and even within species.

INCOMPLETE METAMORPHOSIS



INCOMPLETE METAMORPHOSIS

Egg



Adult

Nymph



CAN YOU IDENTIFY THE
DIFFERENCE BETWEEN
COMPLETE AND
INCOMPLETE
METAMORPHOSIS??

LIFE CYCLES

Complete Metamorphosis

Incomplete Metamorphosis

LIFE CYCLES

Complete Metamorphosis

- Four life stages (eggs, larvae, pupae, adults)
- Life stages look different from each other
- Multiple instars/molts before pupating

Incomplete Metamorphosis

- Three life stages (eggs, nymphs, adults)
- Nymphs look similar to adults
- Multiple instars/molts before reaching adulthood

LIFE CYCLES

- Can you think of other examples of species that undergo complete and incomplete metamorphosis?

COMPLETE METAMORPHOSIS

Egg



Larva



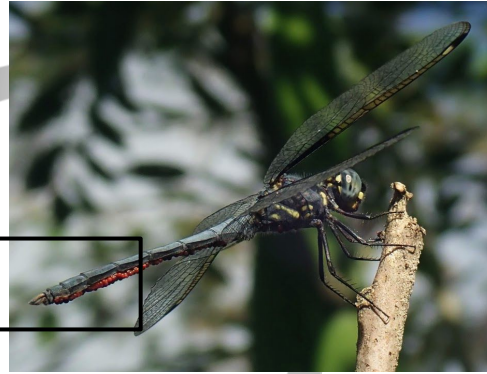
Adult



Pupa

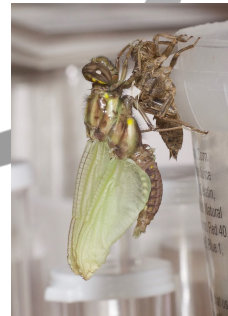
INCOMPLETE METAMORPHOSIS

Egg



Adult
Dragonfly

Nymph



Nymph