

# Metamorphosis

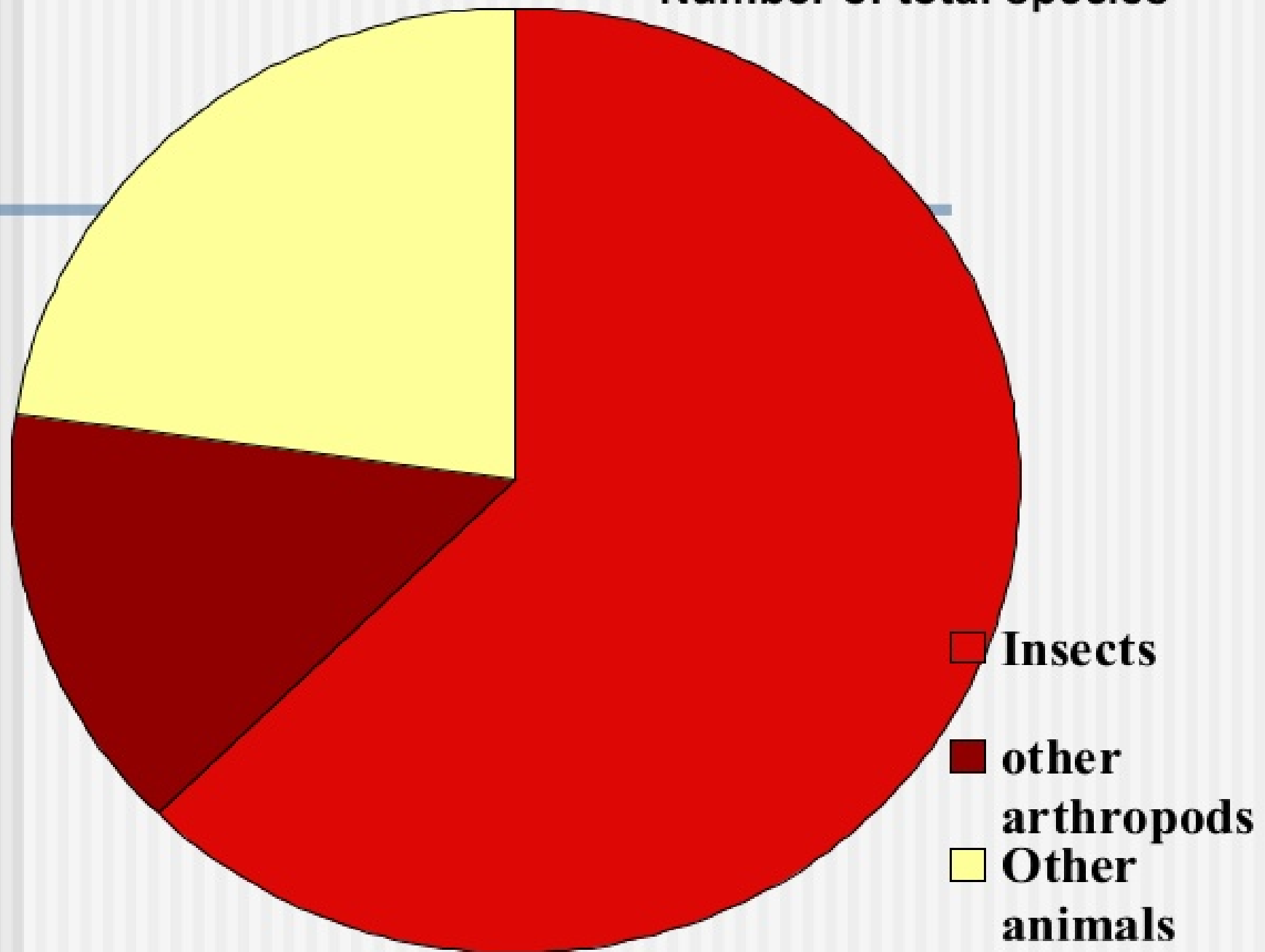


# Insects in the world

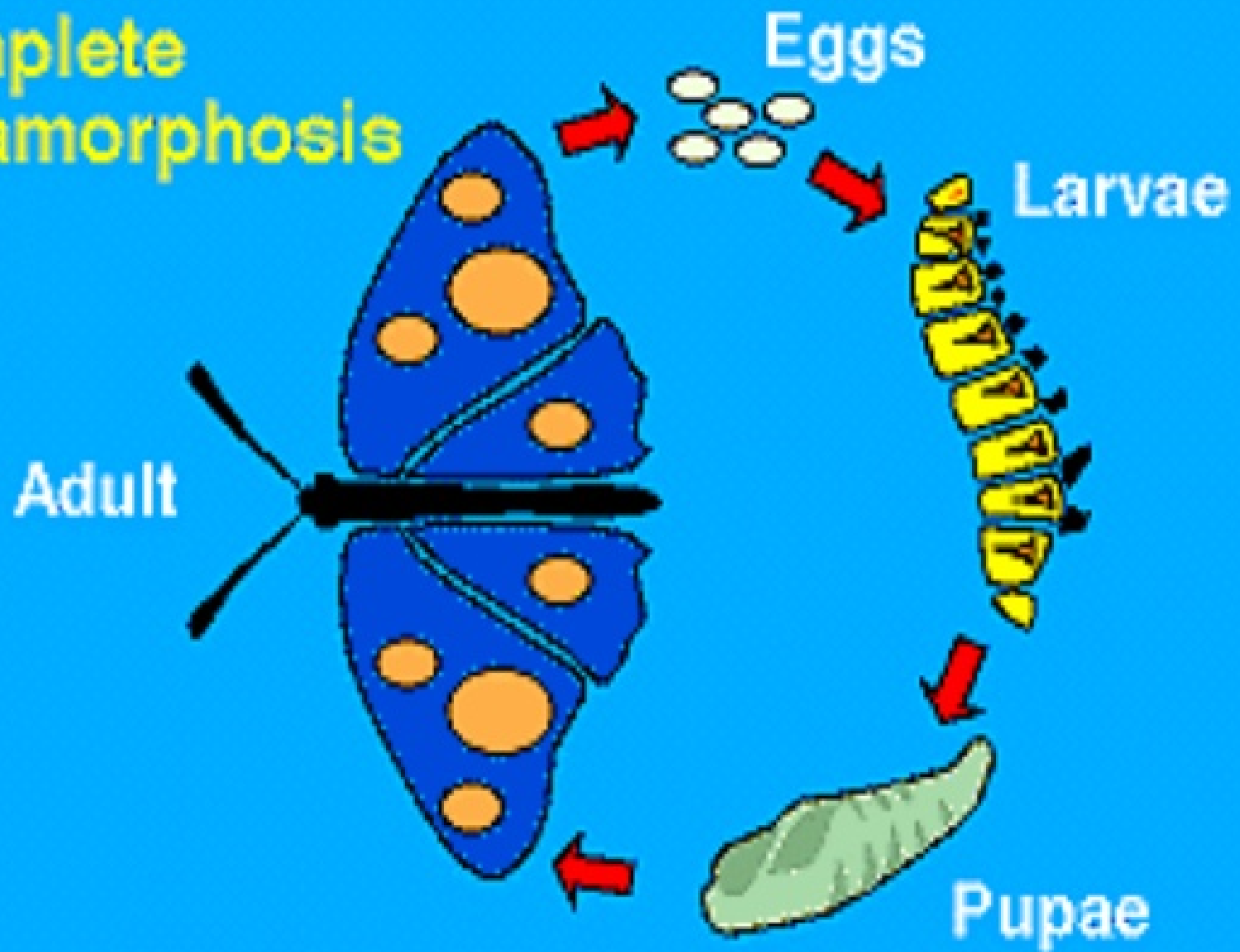
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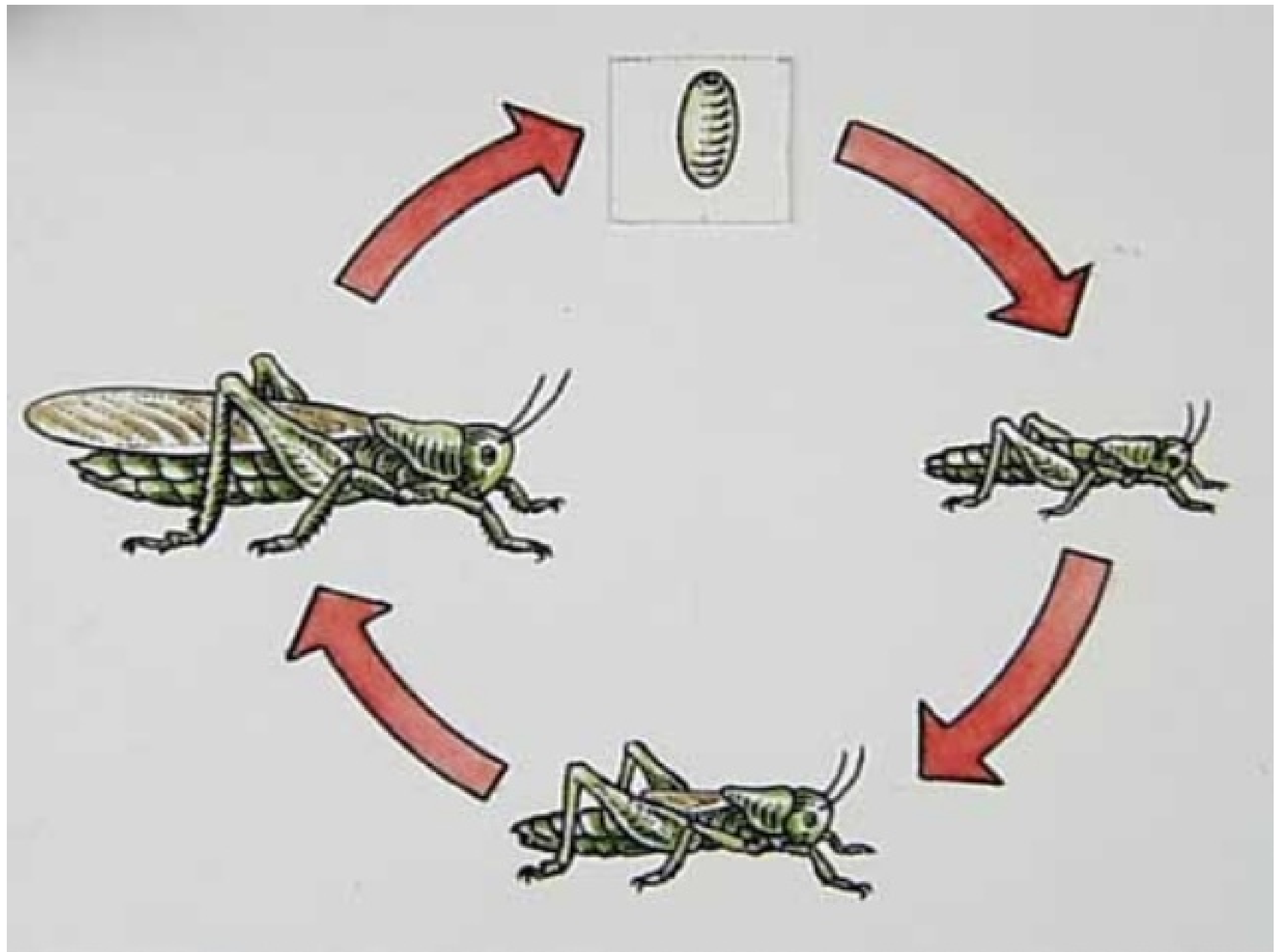
- Most successful animals
- Make up 2 out of three living things
- Make up over 75% of all animals

## Number of total species



# Complete Metamorphosis





# Incomplete Metamorphosis

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Egg- nymph- adult

**\*Three stages of development**

At each stage the insect looks much the same as it does when it becomes an adult.

Examples: Grasshopper or cockroaches

# Insect Development or Metamorphosis

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- Two forms of development  
(change)
  1. Incomplete
  2. Complete

# Metamorphosis

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- Metamorphosis – The changes in the shape or characteristics of an organism's body as it grows and matures.
- Some animals, especially insects, have one kind of body when they are young and a very different kind of body when they are adults.



# Insect -characters

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- Wings
- Only birds, bats and insects
- Only found in adult insects
- Not all insects have wings (fleas, springtails)

## CLASS INSECTA



two pairs of wings

# Insect -characters

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- **One pair of antennae**

May be  
small

CLASS INSECTA



one pair of antennae

# Insect -characters

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- Three sets of legs

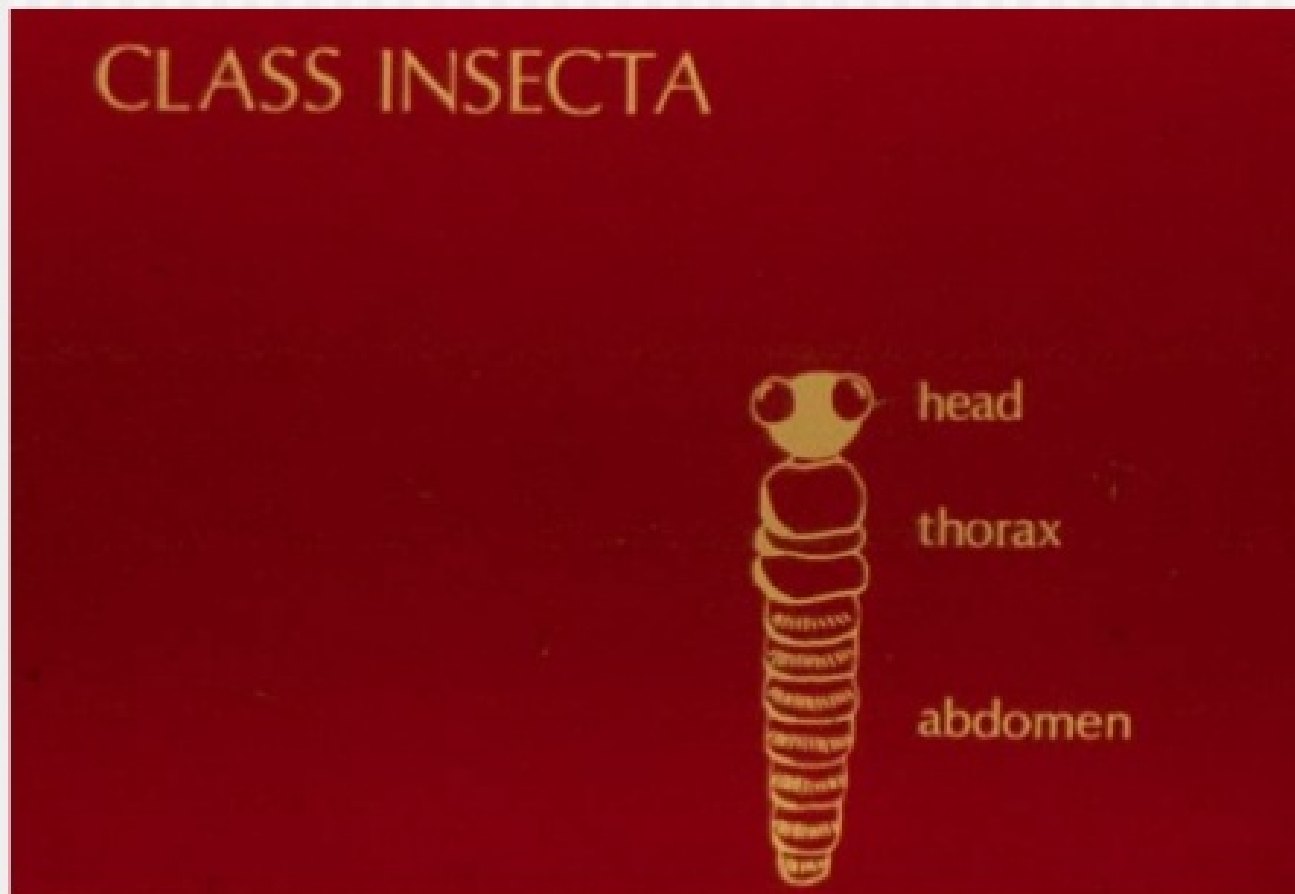
Easiest character to see



# Insect -characters

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- Body divided into three regions



# What is an insect?

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# Arthropods= Insects and their relatives

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Do not have a backbone(invertebrates)

Jointed legged animals include;

Ticks, mites ,spiders ,millipedes

Centipedes, and insects

# What is metamorphosis?

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- Metamorphosis refers to the way that certain organisms develop, grow, and change form.
- Metamorphosis actually means "change".

# Two Types of Metamorphosis

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- **INCOMPLETE METAMORPHOSIS**  
- has THREE stages
- **COMPLETE METAMORPHOSIS** -  
has FOUR stages.



# **INCOMPLETE METAMORPHOSIS**

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Let's take a closer look  
at each stage!

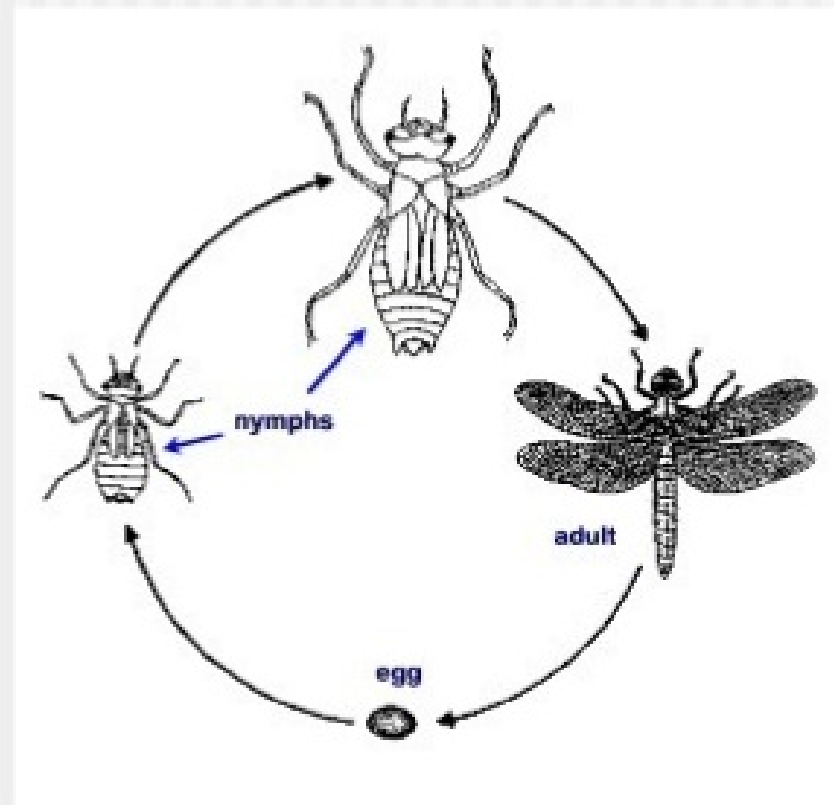
# 3 STAGES OF INCOMPLETE METAMORPHOSIS

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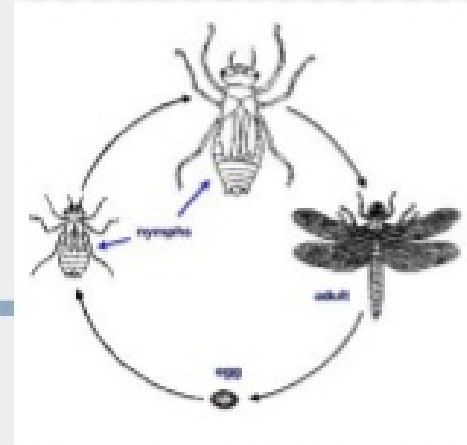
■ Egg

■ Nymph

■ Adult

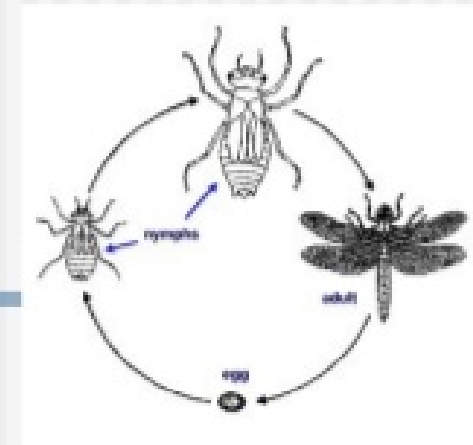


## ■ EGG



- A female insect lays eggs. These eggs are often covered by an egg case which protects the eggs and holds them together.

# ■ NYMPH

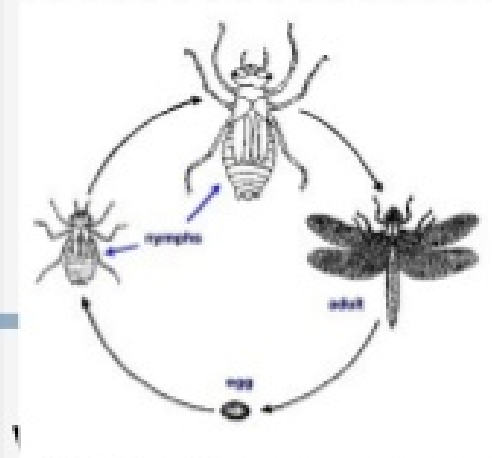


- The eggs hatch into nymphs.
- Nymphs look like small adults, but usually don't have wings.
- Insect nymphs eat the same food that the adult insect eats.
- Nymphs shed or molt their exoskeletons (outer casings made up of a hard substance called chitin) and replace them with larger ones several times as they grow.
- Most nymphs molt 4-8 times.

## ■ ADULT

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- The insects stop molting when they reach their adult size. By this time, they have also grown wings.

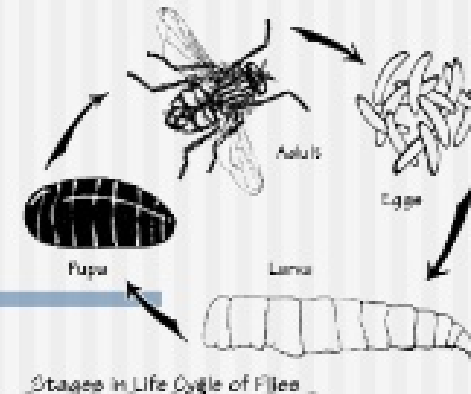


# **COMPLETE METAMORPHOSIS**

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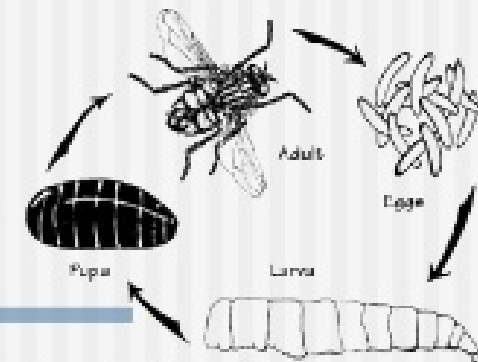
Let's take a closer look  
at each stage!

# ■ PUPA



- Larva make cocoons around themselves.
- Larva don't eat while they're inside their cocoons.
- Their bodies develop into an adult shape with wings, legs, internal organs, etc.
- This change takes anywhere from 4 days to many months.

# ■ ADULT

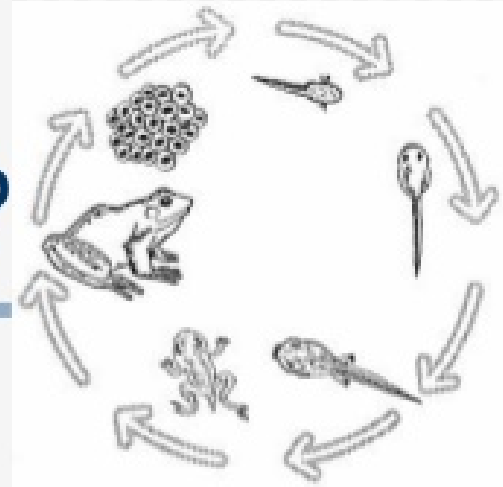


Stages in Life Cycle of Flies

- Inside the cocoon, the larvae change into adults. After a period of time, the adult breaks out of the cocoon.



# WHAT ABOUT FROGS?



- Frogs undergo a different type of COMPLETE METAMORPHOSIS.
- From the egg emerges a tadpole, which lives in the water, breathes with gills, and has a tail.
- As the tadpole grows, lungs and legs form, and the gills and tail are absorbed into the body.
- Finally, the animal leaves the water and lives mainly on land, as a frog.