

Invertebrates & Animal Life Cycles

Week 30 — Wednesday | Animals Without Backbones

Reading Time

When you think about all the animals on Earth, vertebrates (animals with backbones) are only a small part of the story. **Invertebrates** are animals that do NOT have a backbone, and they make up about **97% of all animal species** on Earth! That's right — there are far more kinds of animals without backbones than with them. Invertebrates include insects, spiders, worms, jellyfish, octopus, clams, starfish, and many more.

Insects are the largest group of invertebrates. They have six legs, three body parts (head, thorax, abdomen), and most have wings. There are over 1 million known species of insects! Ants, bees, butterflies, beetles, grasshoppers, and flies are all insects. Insects have an **exoskeleton** — a hard outer shell that protects their body instead of an internal skeleton. Some insects go through **complete metamorphosis** (egg → larva → pupa → adult), while others go through **incomplete metamorphosis** (egg → nymph → adult).

Arachnids are another invertebrate group. They have eight legs and two body parts (cephalothorax and abdomen). Spiders, scorpions, ticks, and mites are arachnids. Unlike insects, arachnids do NOT have antennae or wings. Most spiders produce silk to build webs for catching prey. Only a tiny fraction of spider species are dangerous to humans — most are actually helpful because they eat pests!

Other invertebrates include **crustaceans** (crabs, lobsters, shrimp) with hard shells, **mollusks** (snails, clams, octopus, squid) with soft bodies, and **annelids** (earthworms) with segmented bodies. **Echinoderms** (starfish, sea urchins, sand dollars) have a water vascular system that helps them move and catch food. **Cnidarians** (jellyfish, corals, sea anemones) have stinging cells called **cnidocytes** that they use to catch prey.

Reading Questions

1. What percentage of animal species are invertebrates?

2. How many legs do insects have? How many legs do arachnids have?

3. What is an exoskeleton and how is it different from a backbone?

4. Explain the difference between complete and incomplete metamorphosis. Give an example of each.

Vocabulary Grid

 **Invertebrate**

 **Exoskeleton**

 **Metamorphosis**

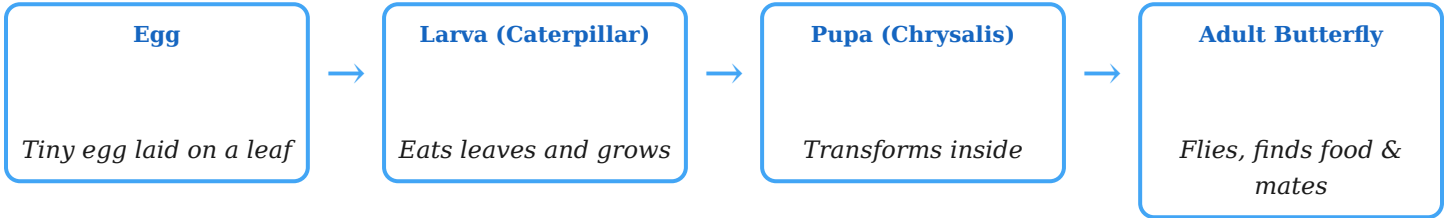
 **Arachnid**

 **Crustacean**

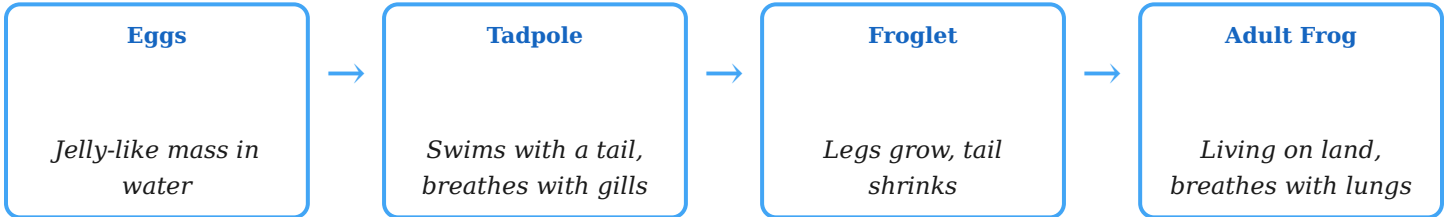
 **Mollusk**

Animal Life Cycles

Butterfly Life Cycle — Complete Metamorphosis



Frog Life Cycle — Metamorphosis



Vertebrate vs. Invertebrate Comparison

Feature	Vertebrates	Invertebrates
Backbone	Yes	No
Body type		
Skeleton		
Examples		
Number of species		
Size range		

Insect or Not an Insect?

Write YES if it's an insect, NO if it's not. Explain why.

Animal	Insect? (YES/NO)	Why?
Butterfly		
Spider		
Beetle		
Scorpion		
Ant		
Centipede		
Grasshopper		
Tick		

Draw a Butterfly Life Cycle

Draw each stage of the butterfly life cycle. Label each stage.



Mini Investigation: Earthworm Observation

Materials: An earthworm (ask an adult to help!), a magnifying glass, a damp paper towel, a plastic container with holes in the lid.

Steps:

1. Place the damp paper towel in the container and gently set the earthworm on top.
2. Observe the earthworm for 5 minutes. Draw what you see.
3. Notice how it moves — does it use legs? How does it move without legs?
4. Gently touch the earthworm and note its reaction.
5. After observing, return the earthworm to damp soil outside.

Draw your earthworm and label what you can see:



Observations:

1. How does the earthworm move? _____
2. What did you notice about its skin? _____
3. Earthworms are _____ (vertebrate/invertebrate). Why? _____

Think About It

If invertebrates make up 97% of all animal species, why do people usually think about vertebrates more? Do you think invertebrates are important? Explain.
