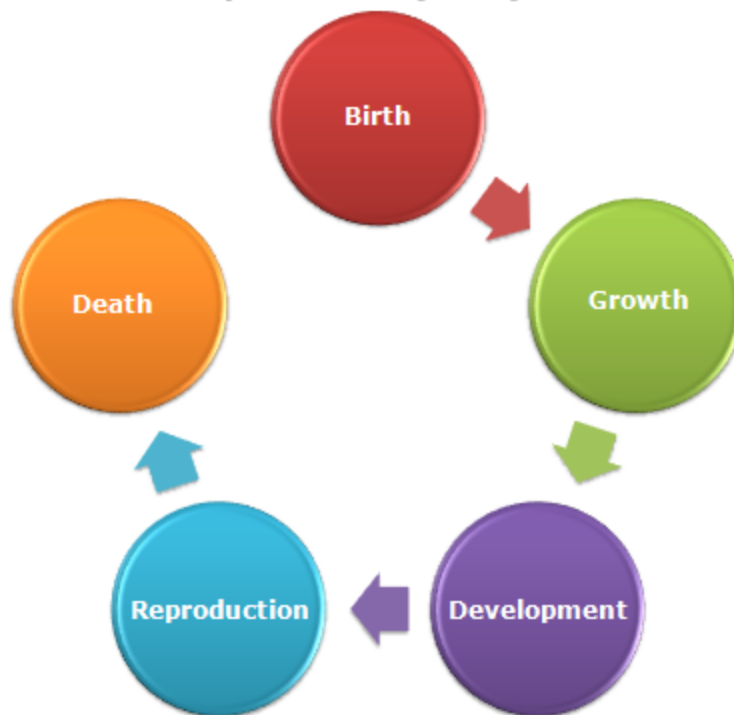


Life Cycles

Life Cycles

Together, all the steps that an organism goes through in its life are called the organism's **life cycle**. Life cycles have five basic steps: birth, growth, development, reproduction, and death.

Life Cycle of a Single Organism



General Stages of a Life Cycle

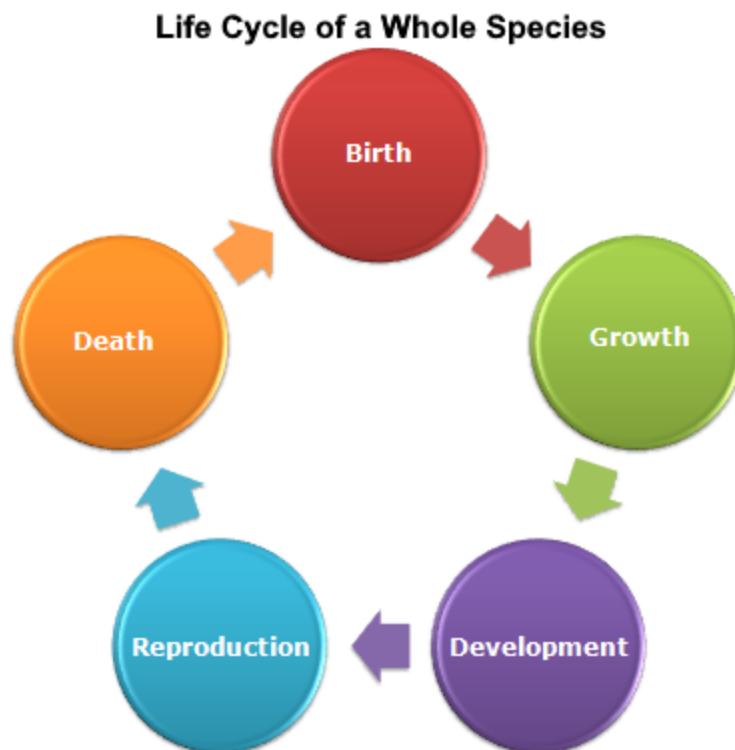
1. **Birth**—The life of every organism must begin at some point. For humans, bears, dogs, cats, and many other animals, the beginning of the life cycle is birth. For birds, snakes, and other animals that lay eggs, the beginning of the life cycle is *hatching*. And plants that grow from seeds begin life when the baby plant breaks out of the seed, which is called *germination*.
2. **Growth**—Organisms become larger through the process of growth. For example, a puppy may grow taller, and its body and ears might get longer. A plant grows taller and wider than it was when it first came out of the seed.

3. **Development**—At the same time an organism is growing, it is also changing, or *developing*. During development, an organism becomes more and more like an adult. For example, a young tree might have a smooth, green, flexible trunk. But as the young tree develops, the trunk becomes rougher and stiffer, like an adult's trunk.
4. **Reproduction**—When an organism is in the adult stage, it can create young—called *offspring*—through reproduction. Humans and other animals produce babies. Many plants reproduce by creating seeds. Reproduction is needed for every kind of organism to continue to exist.
5. **Death**—Death is the last stage in the life cycle. Death is the end of life.

Life Cycles are Continuous

Almost all plants, animals, and other kinds of living things can reproduce. So new offspring (young) are always being produced. One cycle of the life cycle diagram shows the life cycle of a single organism. But the continuous cycle shows the life cycle of a whole *species*—all the plants or animals of the same kind.

So, even though an organism only goes through the cycle once during its life (birth to death), the species goes through the cycle continuously. This is shown by the arrow between death and birth in the life cycle below.



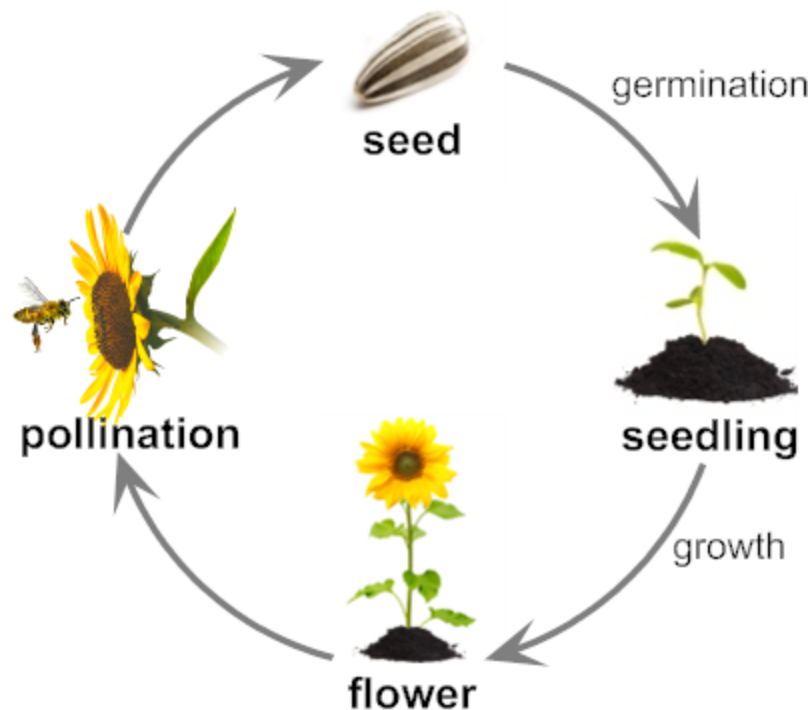
Plant Life Cycles

*The **life cycle** of an organism shows the steps an organism goes through as it begins life, grows, reproduces, and dies. Different kinds of organisms have different life cycles.*

Some plants create new baby plants by producing seeds. These plants can be either flowering plants or nonflowering plants. Flowering plants have flowers, while nonflowering plants do not. The life cycle of a flowering plant is shown below.

Flowering Plant Life Cycle

In flowering plants, flowers are structures that help the plants to produce seeds.



- **Seed**—Seeds are structures that some plants make that allow them to reproduce. Each seed contains a tiny baby plant and the food the plant will need to break out of the seed, grow up through the soil, and grow its first leaves.
- **Seedling**—Young, small plants that have not reached the adult stage are called seedlings.
- **Flower (adult plant)**—Flowers are structures that are produced by adult plants. Seeds are created from flowers.

- **Pollination**—When pollen grains are carried by insects, other animals, wind, or water from the male part of one flower to the female part of another flower, it is called *pollination*.

After pollination, *fertilization* takes place, and then seeds form. In some plants, fruit grows around the seeds to protect them. In other plants (such as dandelions), structures called *seedheads* form. The seedhead or the fruit contains all the seeds produced by one flower. The seeds contained inside fruit are often dispersed (moved somewhere else) by an animal that eats the fruit and then passes the seeds through its body. Seeds contained in seedheads are often scattered by the wind when the seedheads release them.

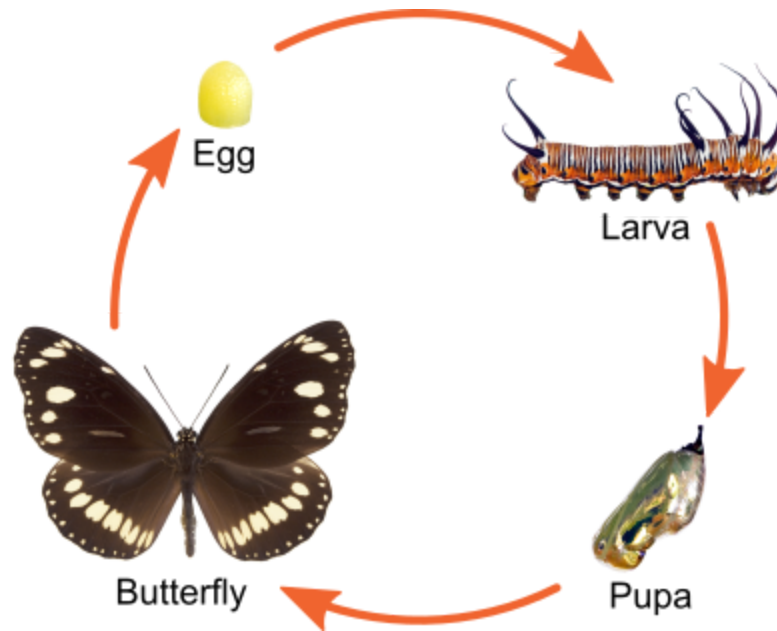
When the conditions are right, *germination* occurs. During germination, the seeds break open and the baby plants inside them begin to grow.

Animal Life Cycles

A life cycle describes all the stages which organisms of the same type go through during their lives. Different kinds of organisms have different life cycles. Individual organisms go through the life cycle only once, but the life cycle repeats over and over for the species.

Butterfly Life Cycle

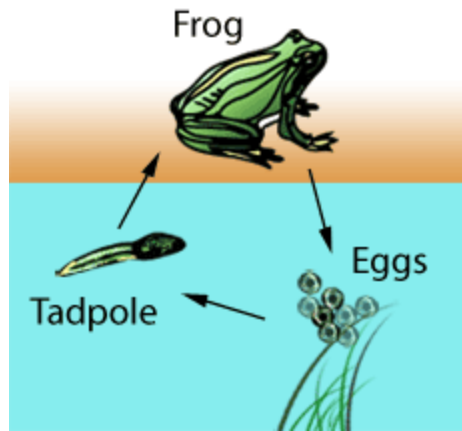
Butterflies and some other insects, such as ladybugs and flies, have similar life cycles. During the life cycles of these insects, a development process called **metamorphosis** takes place. During metamorphosis, the shape and other characteristics of the insect change greatly.



- **Egg**—Adult butterflies lay eggs. When the eggs hatch, caterpillars (larvae) are released.
- **Larva**—The young stage of a butterfly is called the larval stage. Caterpillars are these larvae. Caterpillars eat leaves and grow until they are ready to begin the pupa stage.
- **Pupa**—When the bodies of the caterpillars begin the process that will eventually change them into butterflies, they are in the pupal stage. The word *chrysalis* is sometimes used to describe butterflies in this stage of their lives.
- **Butterfly**—Butterflies are adults. Butterflies lay eggs, and the life cycle for the butterfly's species begins again.

Frog Life Cycle

Some amphibians also have life cycles that involve metamorphosis. An example is the tadpole, which changes into a frog.



- **Eggs**—Frogs lay their eggs in the water, not in a nest on land. When the eggs hatch, the young animals enter the larval stage (tadpoles).
- **Tadpole**—A tadpole is the larval stage of a frog. The tadpole lives in the water while it eats, grows, and gets ready to breathe air and move on land.
- **Frog**—A frog is the adult stage in a frog's life cycle. Adult frogs are able to survive on land.

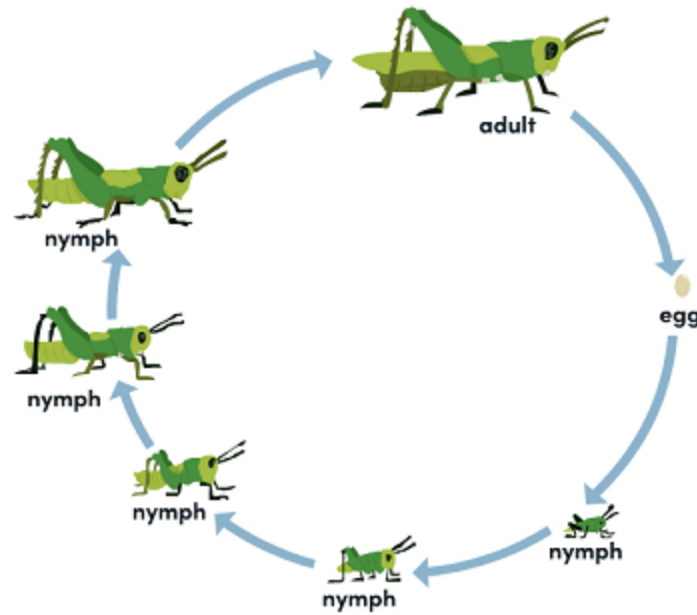
Most amphibians, such as frogs, begin their lives inside eggs that are laid in water. The tadpole—the larval form of the animal—has fins and gills when it hatches from an egg. It stays in the water while it grows and develops. The larva eventually grows legs and lungs, and it loses its gills. This change of a larva (tadpole) into a frog is metamorphosis.

Watch the video below to learn more about the life cycles of insects and amphibians.

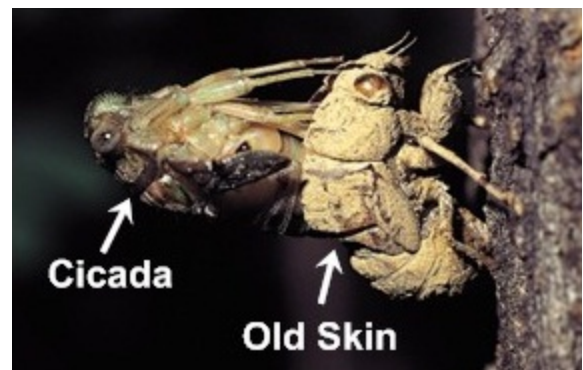
Clip provided by Education Clip Library with permission from ITN Source

Comparing Life Cycles

The life cycles of some insects, such as grasshoppers, are different from the life cycle of the butterfly. Young grasshoppers look much the same as adults, only smaller.



But in the life cycle of these kinds of insects, there are times when the hard outer shells (called *exoskeletons*) must be shed, or taken off. The cicada in the picture is doing this: crawling out of its old, hard shell. Then new, larger shells must grow in their place. This is necessary because a hard exoskeleton cannot grow to a larger size. The life cycle of organisms that go through these life stages is called *incomplete metamorphosis*.



The life cycles of mammals, such as humans, dogs, cats, giraffes, mice, beavers, and bears, are different from the life cycles of butterflies, frogs, and grasshoppers. The mammal life cycle generally has four main stages. These are: egg, embryo, infant, and adult. Mammals are born. From birth, these animals usually look a lot like their parents.



Kittens are infant cats. Like most mammals, baby cats are very similar to adults.

Frogs, butterflies, and ladybugs hatch from eggs. Right after hatching, these animals often look very different from their parents. But after the animals go through metamorphosis, they look much the same as their parents. Birds are another kind of animal that hatches from eggs. The life cycles of birds contain four main stages—egg, baby, young, and adult. Birds look somewhat like their parents when they hatch, but they look more and more like their parents as they grow older.



eggs of the American robin



baby robins

image courtesy of Wikimedia



a young robin

image courtesy of US FWS



an adult robin

image courtesy of US FWS

Length of Animal Life Cycles

Different life cycles take different lengths of time to complete. Some life cycles take much longer than others. Bacteria, flies, butterflies, ladybugs, and rodents have somewhat short life cycles. Humans and some kinds of birds, tortoises, and trees can have longer life cycles of 100 years or more.