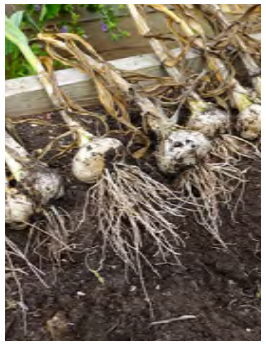
Asexual reproduction

- The parent plant creates an exact copy of itself without involving another plant.
- Natural methods include **runners, tubers, budding** and **bulbs**.
- Forced methods (by humans) include **cuttings**, layering and divisions.


runner


bulbs

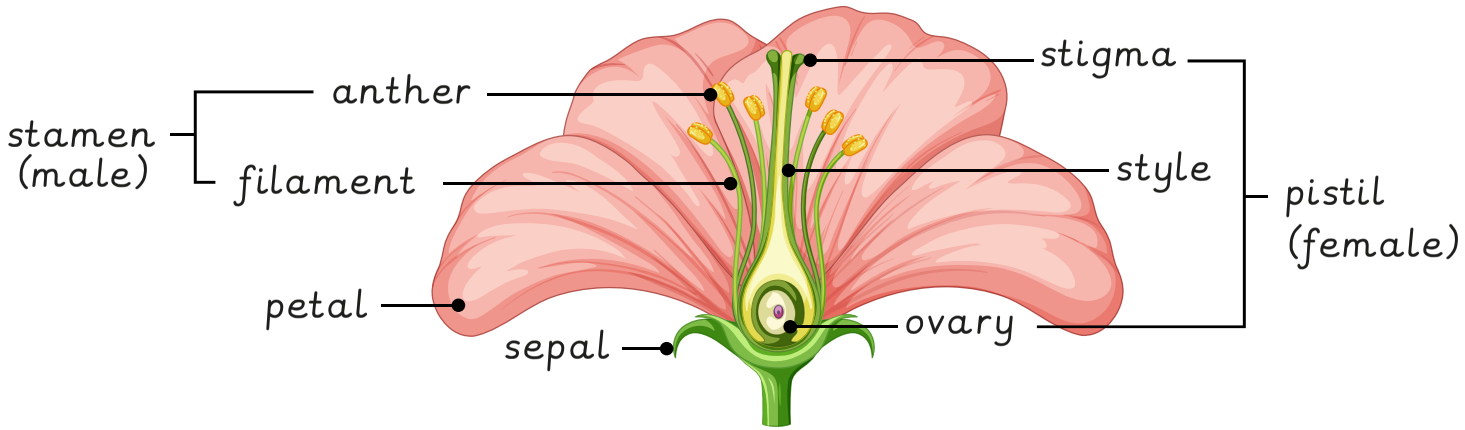

budding


cutting

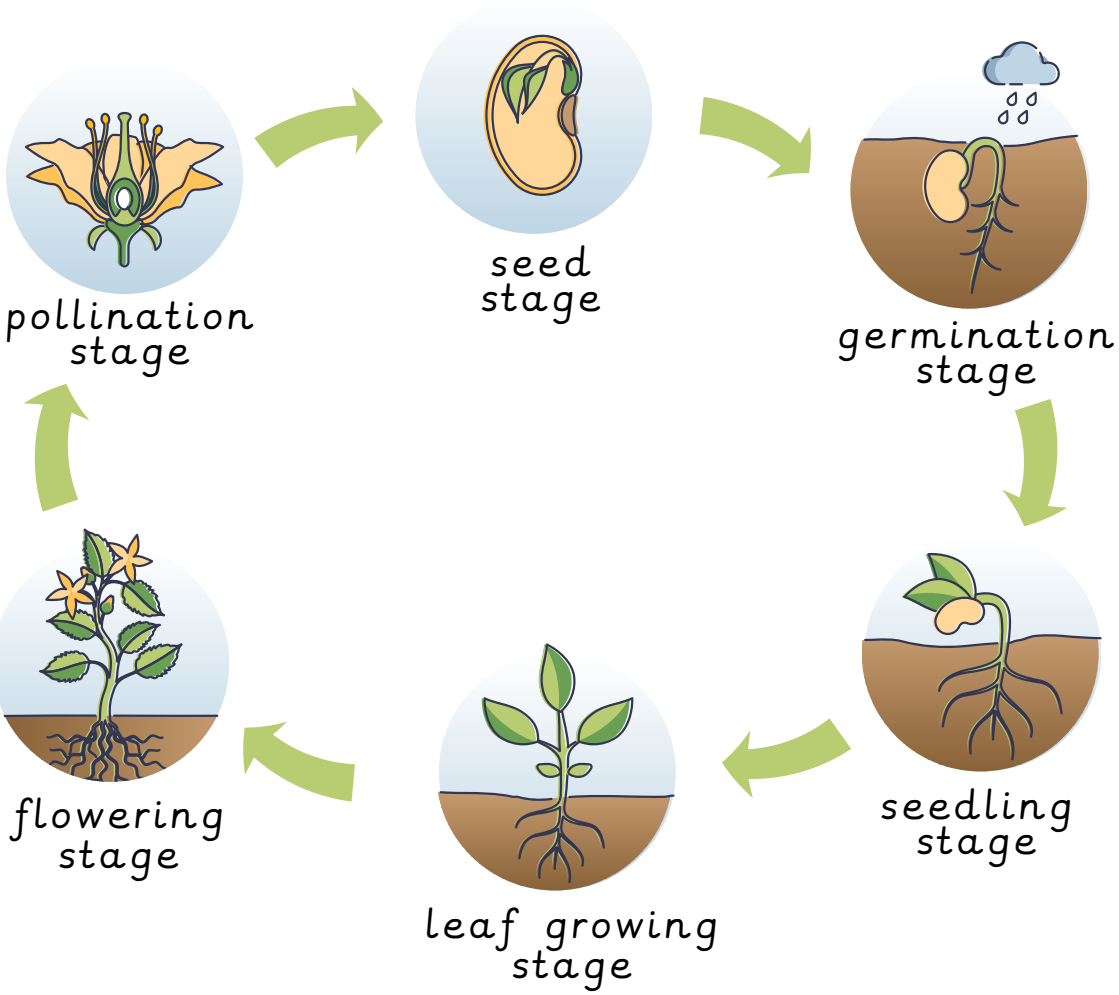

tuber

Sexual reproduction

- Pollen is transferred from the male anther of one flower to the female stigma of a flower on another plant.
- Pollen can be transferred by insects, wind or other animals.
- **Fertilisation** happens when the male **pollen** reaches the **ovary** and combines with the female ovules.
- The fertilised ovule then develops into a seed which can be dispersed by wind, air or animals.
- Seeds can then grow into new plants, starting the plant life cycle again.

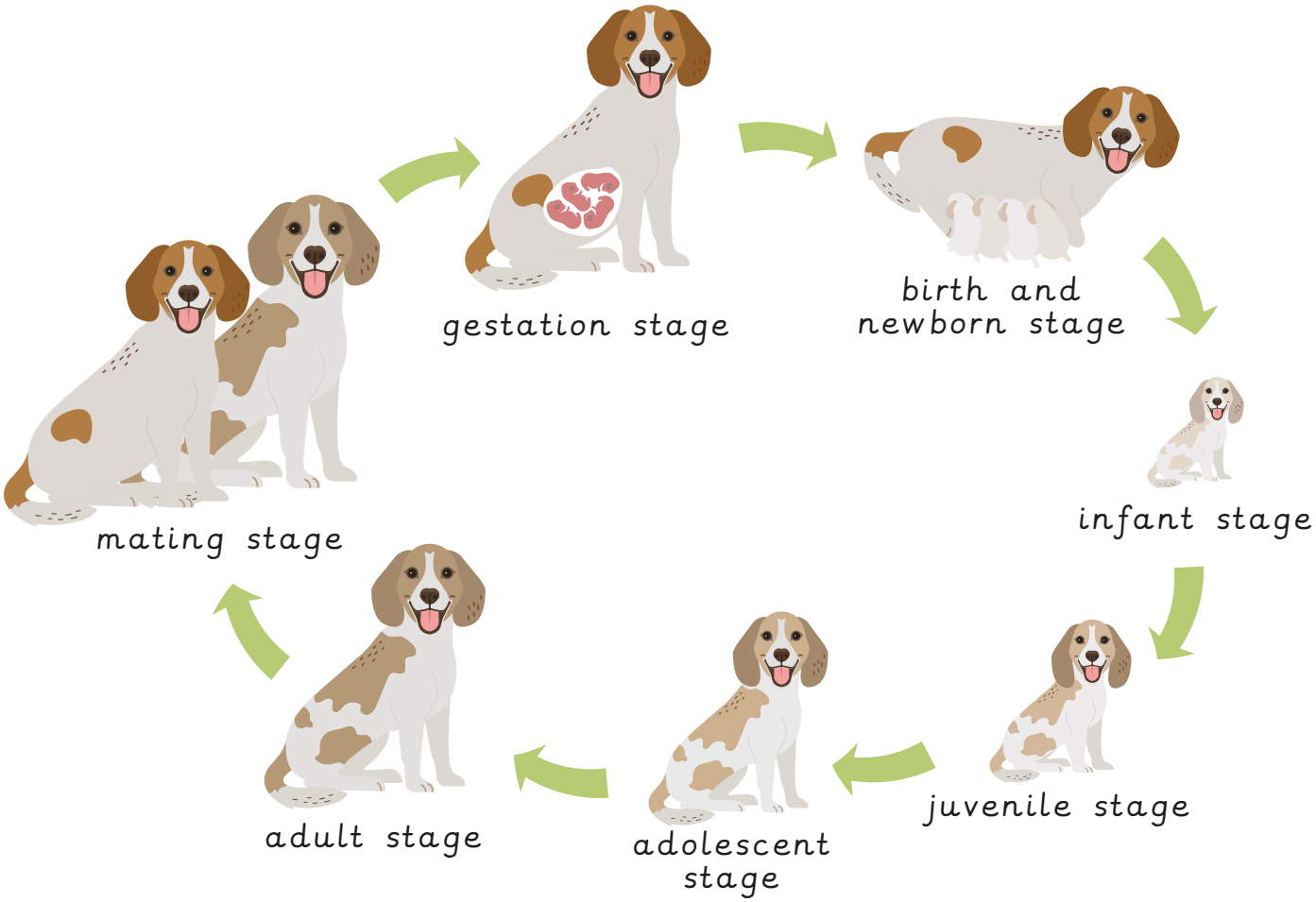


Life cycle of a plant



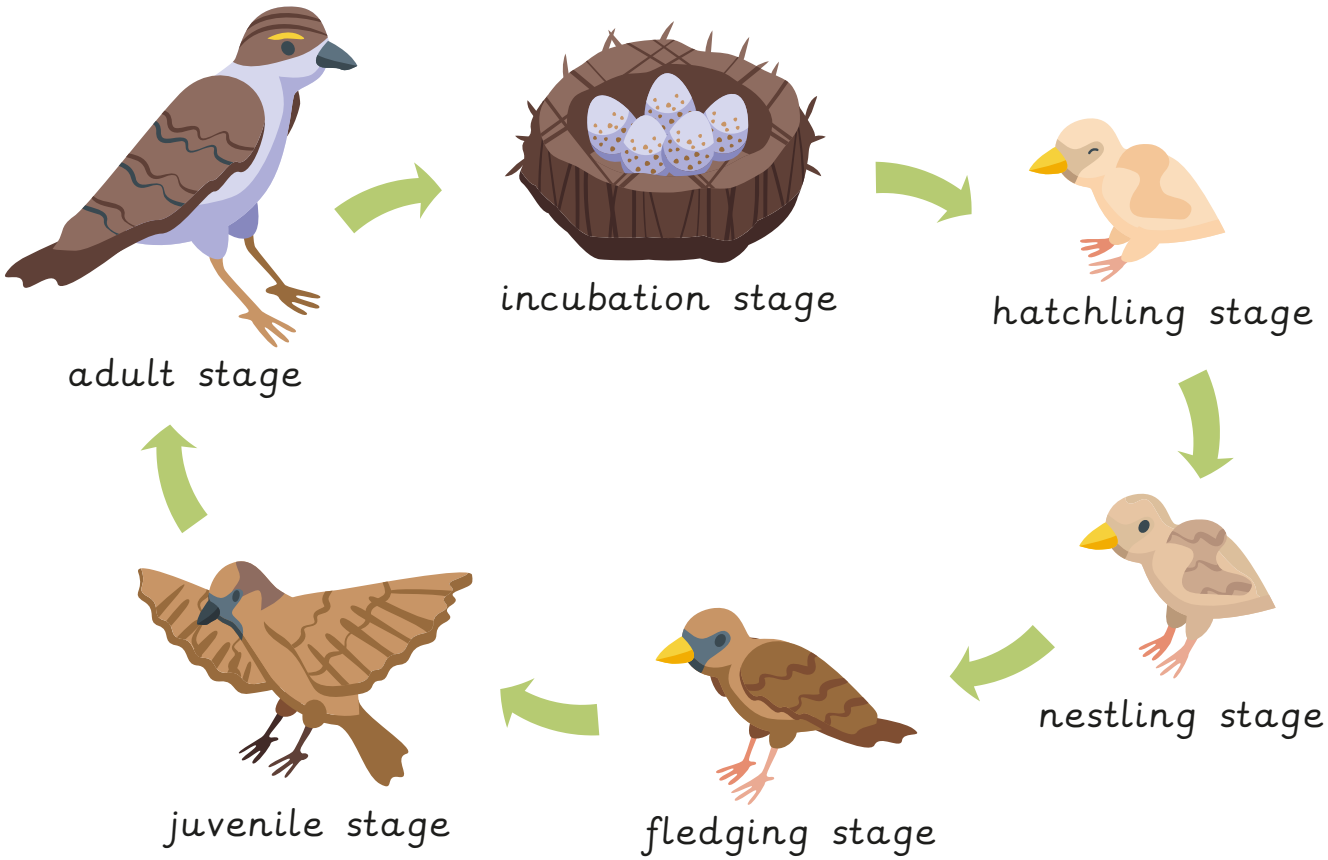
- **Seed stage:** the life cycle begins with a seed, which contains the offspring of the parent plant.
- **Germination stage:** the seed absorbs water and begins to sprout, emerging from the soil as a small shoot.
- **Seedling stage:** the shoot develops into a seedling, growing roots for water and nutrients and leaves for absorbing light.
- **Leaf growing stage:** the plant continues to grow, developing more leaves that enable it to gather more sunlight and grow larger.
- **Flowering stage:** produces flowers, which are the reproductive structures of the plant.
- **Pollination stage:** pollen made by the male part of the flower is transferred to the female parts of flowers, often with the help of wind, insects or animals, leading to fertilisation.
- **Back to seed stage:** after fertilisation, the flowers develop into fruits or seed pods, which contain the new seeds, and the cycle begins again.

Life cycle of a mammal



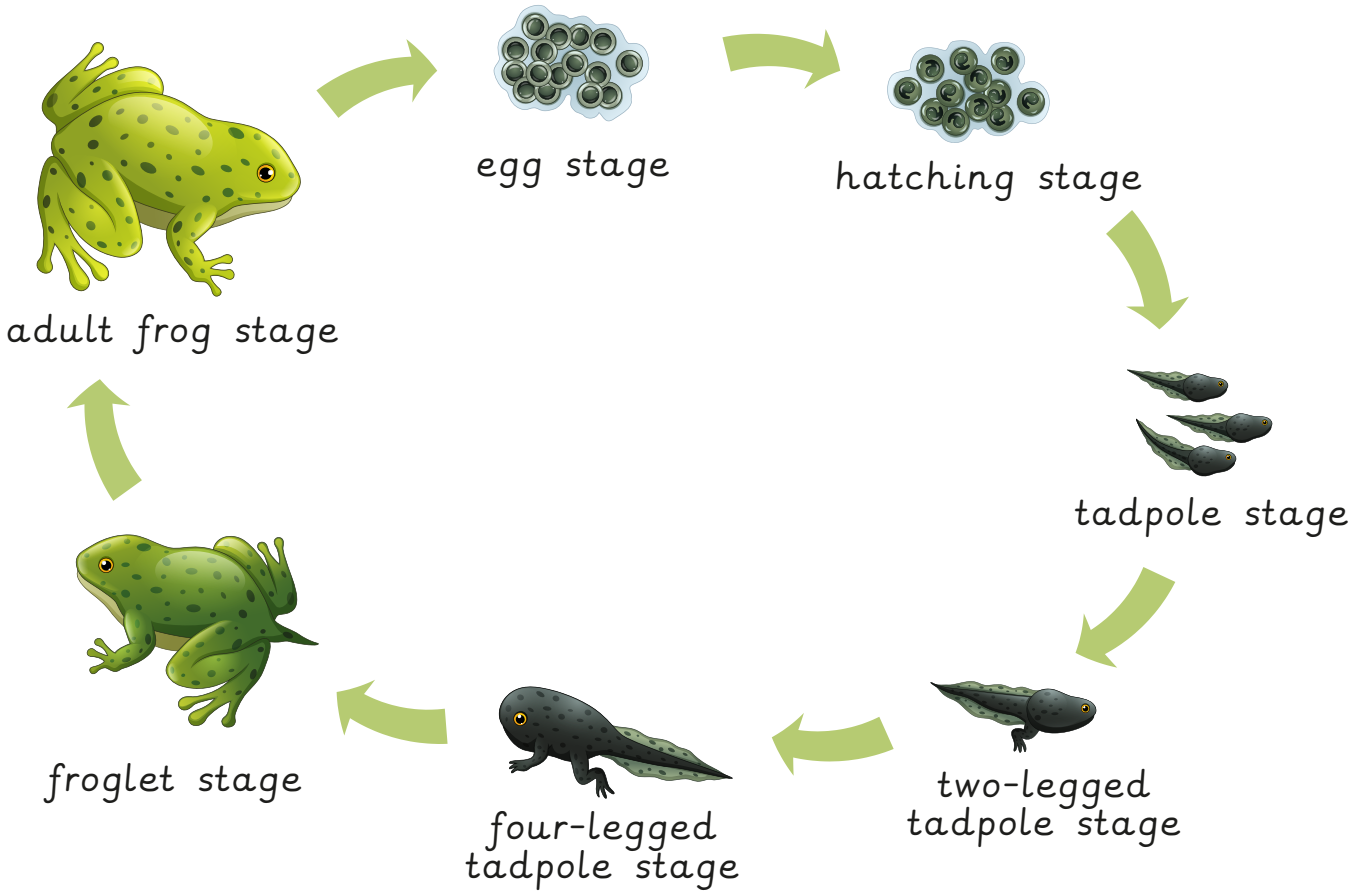
- **Mating:** a male and female mammal produce offspring (new baby mammals) with characteristics of both parents.
- **Gestation:** the offspring develop and grow inside the mother. The time it takes for the offspring to develop differs for different mammals.
- **Birth:** the fully grown baby, or babies, comes out of the mother; most mammals give birth to live young.
- **Newborn:** a baby mammal that has just been born; they usually need a lot of care from their mother. Female mammals produce milk, which provides their offspring with all the nutrients they need in the newborn phase.
- **Infancy:** the baby mammal starts growing and learning things like walking and hunting. They usually still need a lot of help and protection from their parents.
- **Juvenile:** the mammal is older and a bit more independent but is not yet an adult; they keep growing and learning how to live independently.
- **Adolescence:** the mammal is almost an adult; it undergoes changes that prepare it for adult life, like being able to reproduce.

Life cycle of a bird



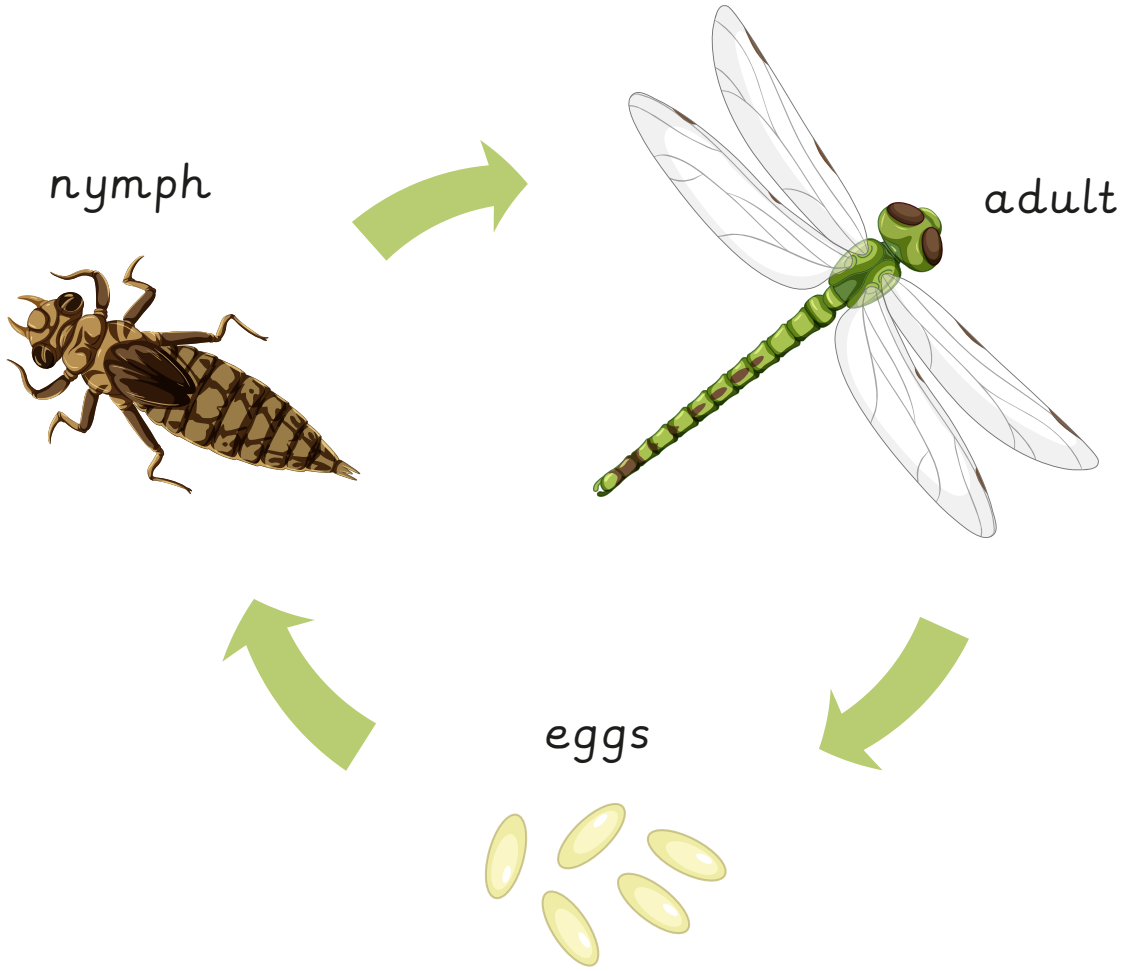
- **Incubation stage:** an egg is laid by the female bird. The egg needs to be kept warm so the offspring inside can grow and develop.
- **Hatchling stage:** the baby bird hatches from the egg. Many hatchlings are blind as their eyes are closed and have no feathers (some have soft fuzzy feathers). Hatchlings rely on their parents for warmth and food.
- **Nestling stage:** a hatchling becomes a nestling as its eyes open and its feathers begin to grow. Nestlings still very much rely on their parents for warmth and food.
- **Fledgling stage:** the nestling becomes a fledgling as it grows flight feathers. The baby bird starts to flap its wings and make short flights but returns to the nest for food and safety.
- **Juvenile stage:** the fledgling finally leaves the nest and its parent's care and becomes a juvenile. It finds its own food but may not have full adult colours to its feathers.
- **Adult stage:** the juvenile stops growing and reaches reproductive maturity; females are now able to lay eggs. Male and female birds find a partner; some even mate for life.

Life cycle of a amphibian



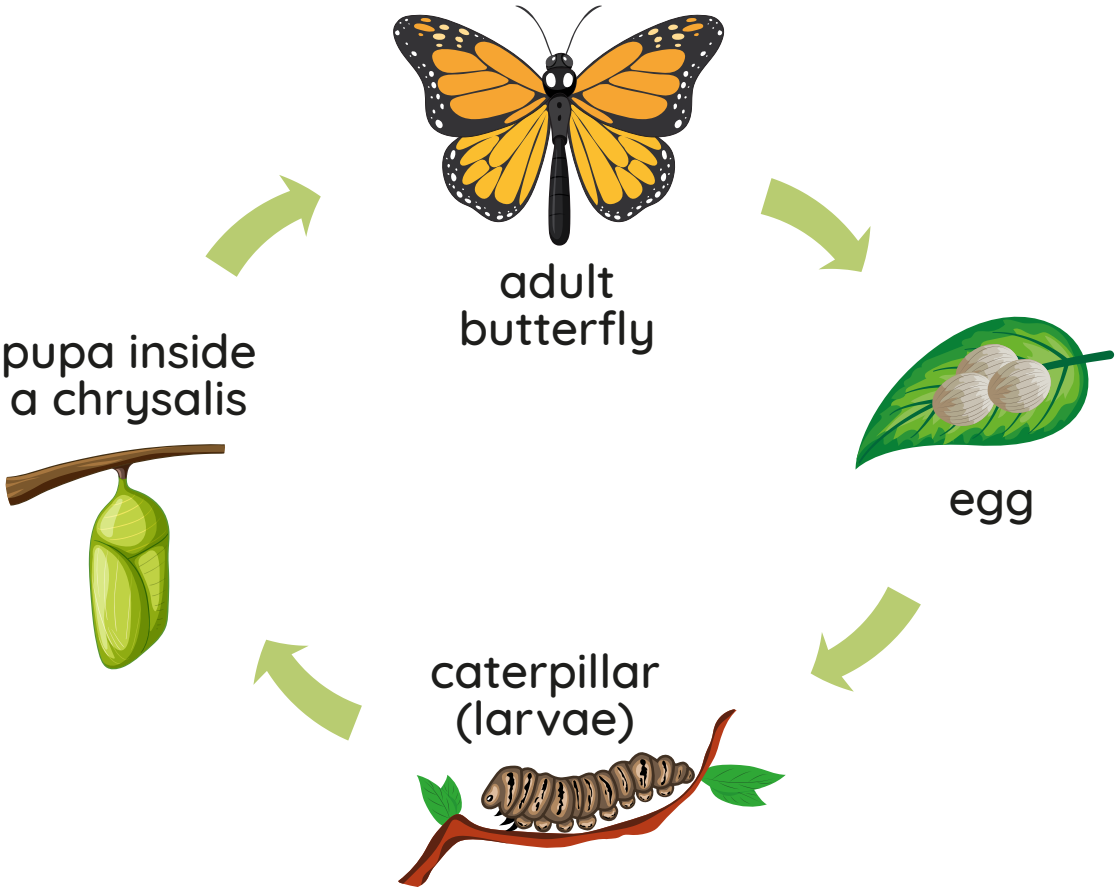
- **Egg stage:** the frog starts as an egg, often laid in water.
- **Embryo stage:** inside the egg, the frog begins to develop.
- **Tadpole stage:** after hatching, it becomes a tadpole, breathing with gills and swimming in water.
- **Two-legged tadpole stage:** the tadpole grows its back legs.
- **Four-legged tadpole stage:** the tadpole then grows its front legs and its tail shortens.
- **Froglet stage:** with a small tail remaining, it begins to develop lungs for breathing air.
- **Frog stage:** as an adult frog, it lives on land and in water, breathing with lungs.

Three-stage insect life cycle



- **Egg:** the insect is laid as an egg, typically in an environment that helps the survival of the next stage, like on a leaf
- **Nymph:** after hatching, the insect enters a nymph stage where it looks like a smaller version of the adult, but without wings. It grows and moults (sheds its skin) several times.
- **Adult:** the insect emerges from a final moult as a fully developed adult with wings. It can now reproduce.

Four-stage insect life cycle



- **Egg:** the insect begins life as an egg, often laid in a location suitable for the next stage, like on a leaf
- **Larva:** the larva looks very different from the adult. It eats and grows, moulting (shedding its skin) several times until it is large enough for the next stage.
- **Pupa:** the transformation stage where the insect develops inside a protective casing (chrysalis or cocoon) and undergoes metamorphosis. Some insects do not metamorphose in a protective casing but instead burrow underground (some beetles) or are protected in a nest (bees and wasps).
- **Adult:** the fully developed insect emerges, ready for reproduction and other adult activities. Adult insects mate and start the life cycle again.