

# Life Cycles

**T**he word *cycle* means “go around.” A wheel goes around. You can observe a wheel go through one cycle. Put a mark on a wheel. That’s the beginning point. Turn the wheel and watch the mark go around. When the mark comes back to the beginning point, the wheel has completed one cycle. Another cycle is the one that happens every day, from sunrise one day to sunrise the next day. One year is a cycle. The Moon goes through a cycle of phases each month.

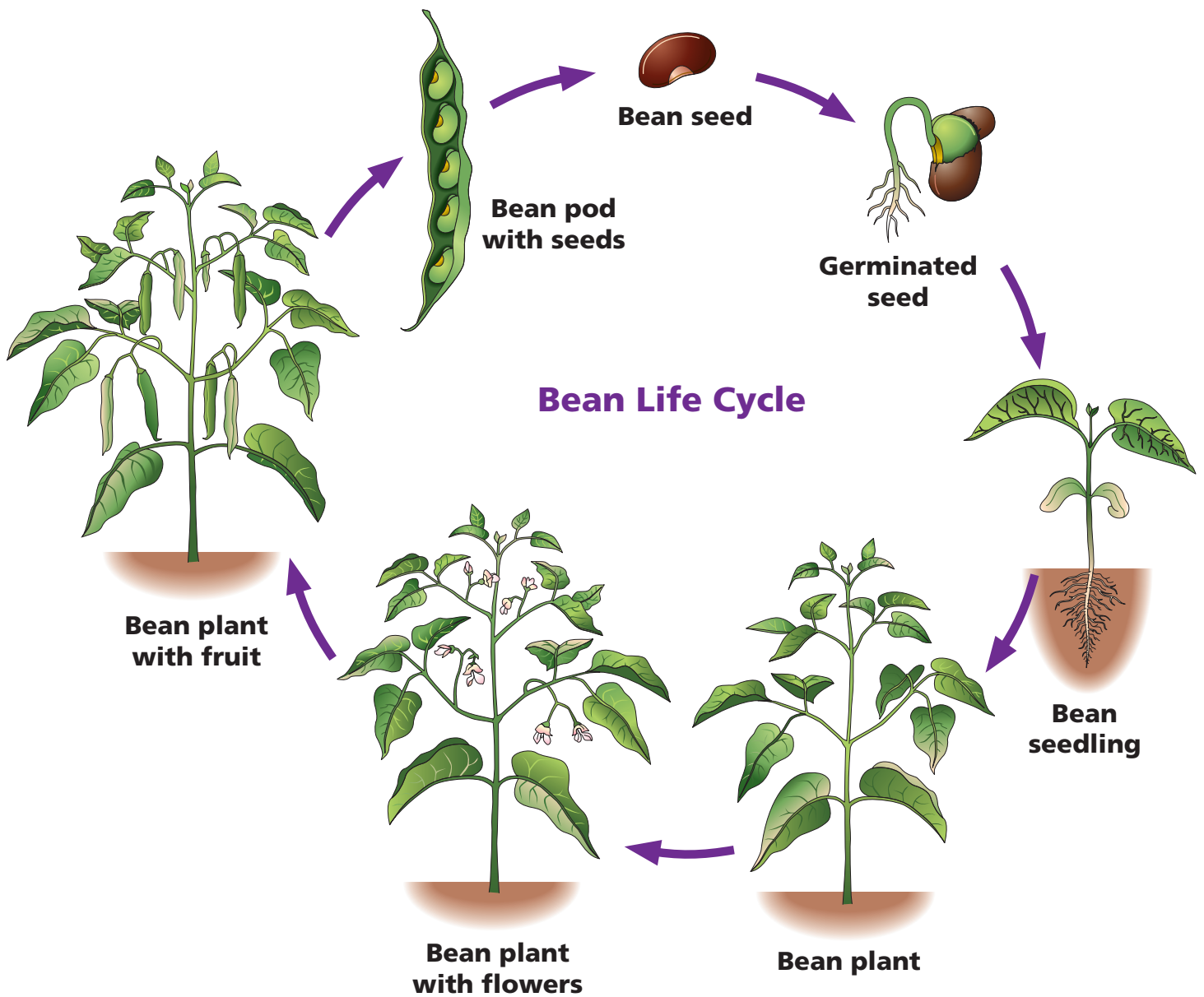
Organisms go through **life cycles**. But an organism’s life cycle is a little different than going around in a circle. Like all cycles, a life cycle has a beginning, things happen, and then you find yourself back at the beginning again.

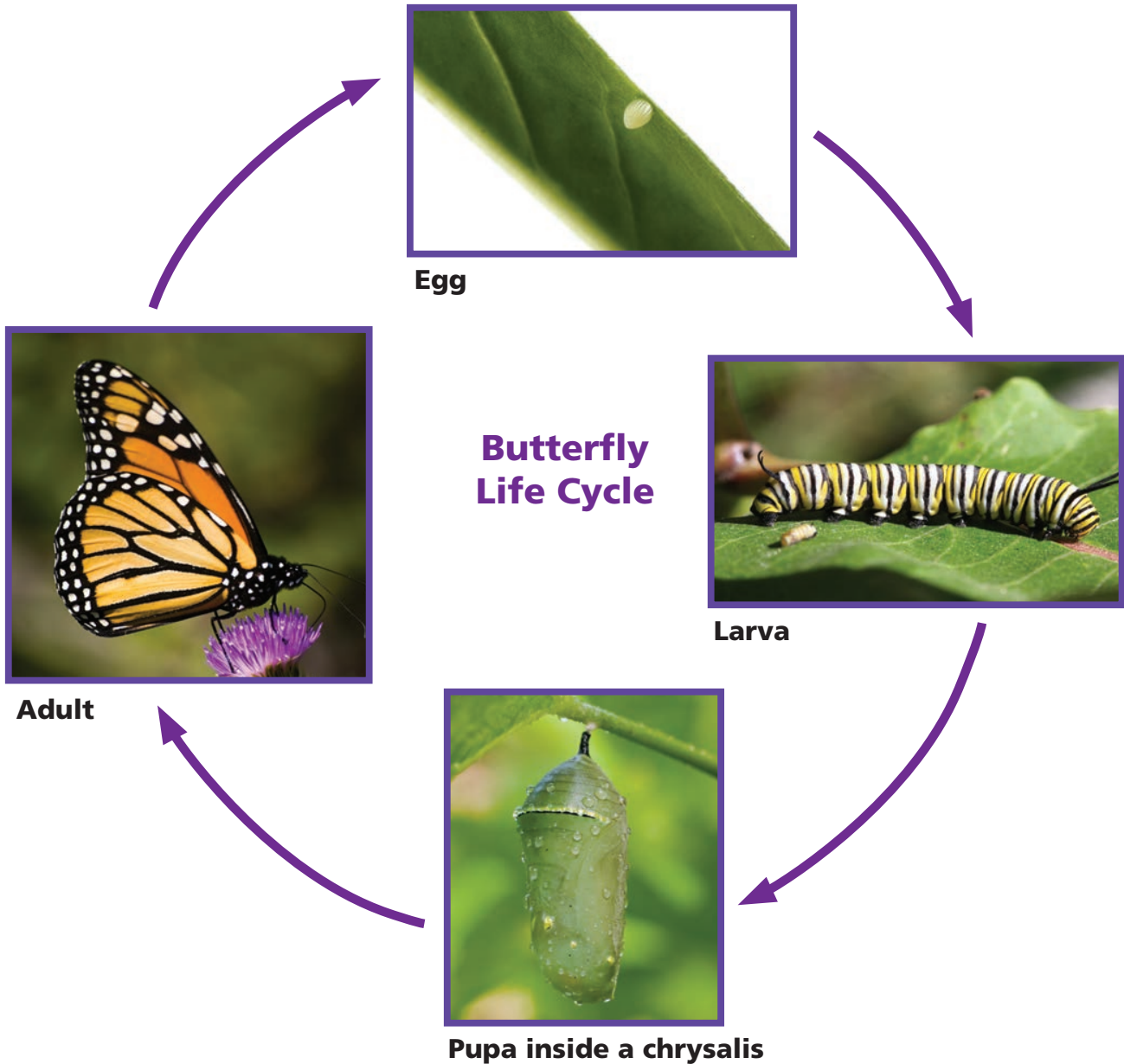
You studied the life cycle of a bean plant. The life cycle started with a bean seed. Inside the bean seed was the dormant embryo of a bean plant. When the bean seed **soaked** up water, the seed germinated. The bean plant started growing.



The root was the first structure to appear. Soon after that, the first leaves appeared on the end of a stem. The baby bean plant had developed into a bean seedling. For several weeks the bean plant got bigger and grew more leaves and stems.

When the bean plant was mature, it developed **flowers**. The flowers changed into fruits, called green beans. Seeds developed inside the fruits. When the fruits were mature, there was a crop of new bean seeds. The bean plant had gone through its life cycle. The plant started as a seed and completed the cycle when it produced new seeds. The seeds might grow into new plants. The life cycle repeats over and over again.





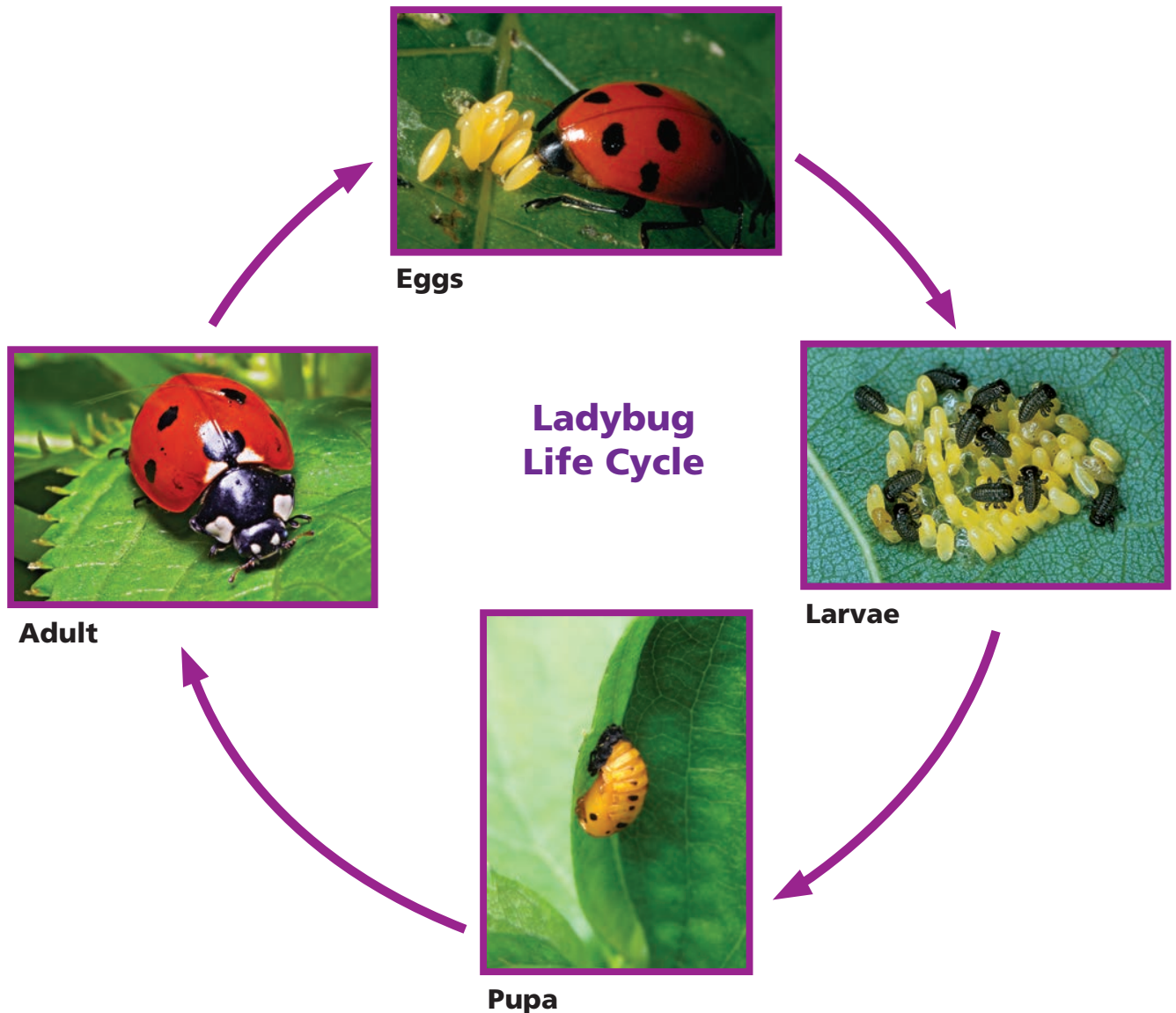
## Butterfly Life Cycle

Other organisms have life cycles, too. But animal life cycles can be very different from the life cycle of a bean plant. Some animals are born alive, and some animals hatch from eggs. They all grow up to be adults. The adults mate and produce offspring. The life cycle of the monarch butterfly starts with an egg. A tiny larva called a caterpillar hatches out of the egg. The caterpillar eats and grows. When it is about as big as your finger, the caterpillar changes into a pupa inside a **chrysalis**. In a couple of weeks, the adult butterfly breaks out of the chrysalis and flies away. In a year, the female lays eggs, completing the life cycle.

# Ladybug Life Cycle

Ladybugs, like monarch butterflies, are insects. Ladybugs and butterflies have similar stages in their life cycles. This life cycle is shared by a number of other kinds of insects.

The ladybug life cycle starts when adult ladybugs mate and the female lays eggs. When an egg hatches, a larva comes out. The black larva is the offspring, but it doesn't look like its parents. The larva eats and grows for 3 or 4 weeks before it pupates. Inside the pupa, the larva is changing. When the pupa opens, an adult ladybug comes out. Adult ladybugs are red with black spots. Now the ladybug offspring looks just like its parents.





**Eggs**

## **Trout Life Cycle**



**Adult trout**



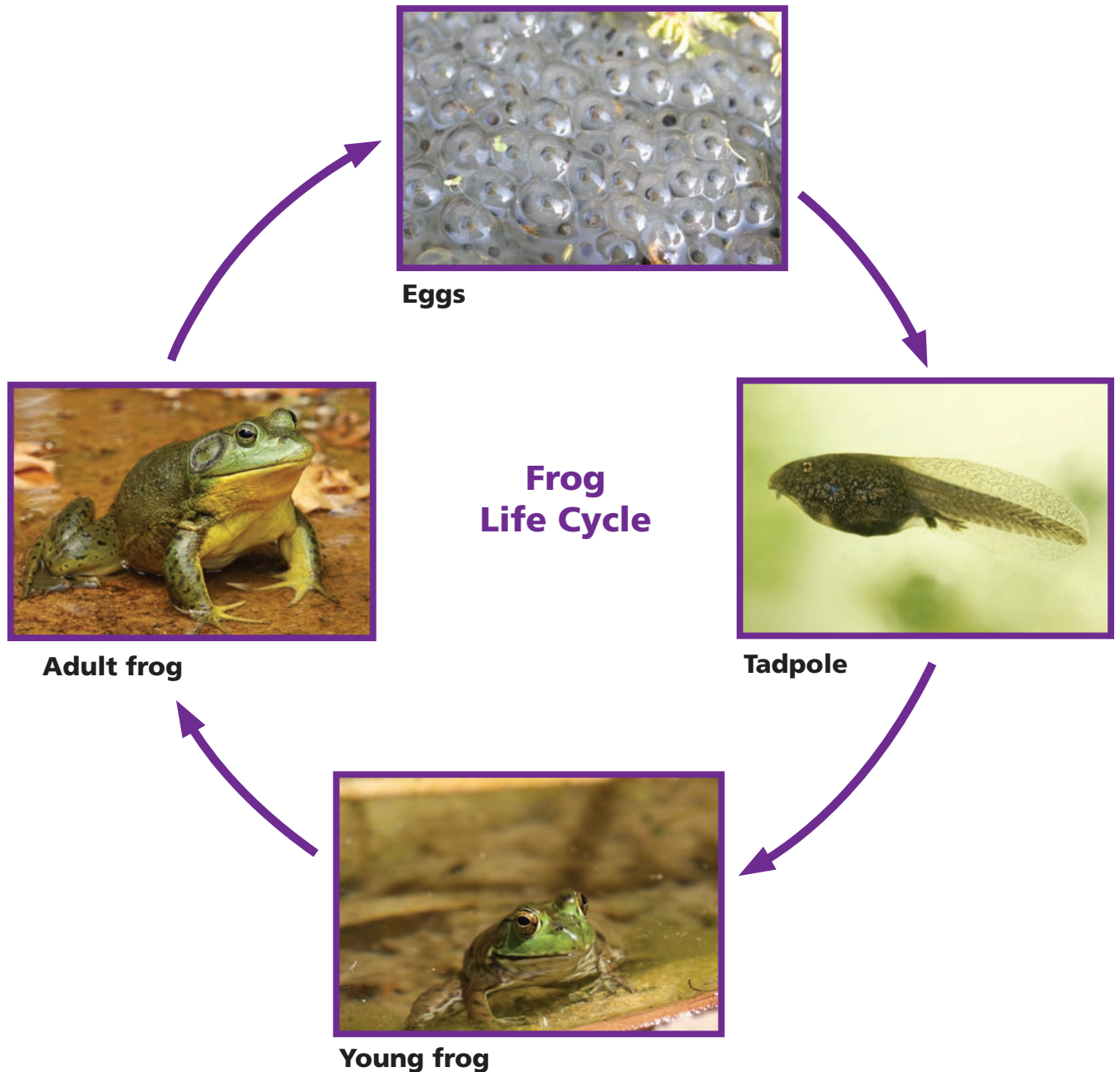
**Young trout**

## **Trout Life Cycle**

Trout lay eggs in streams. After 6 to 8 weeks, the eggs hatch. Tiny, fat babies swim out. You can see that they are fish. But they don't look like their parents yet. For the next year, they grow up little by little. In 2 years, they are adults. They look just like their parents. They mate and lay eggs in the stream. Can you describe the trout life cycle?

## Frog Life Cycle

Frogs lay eggs in water, too. When an egg hatches, a tadpole swims out. It looks more like a fish with a big head than a frog. A tadpole doesn't look like its parents. The tadpole eats and grows. In a few weeks, the tadpole starts to change. Its long, flat tail gets shorter, and its legs start to grow. In a few more weeks, the tadpole has grown into a frog. Now it looks just like its parents.



## Goose Life Cycle



**Eggs**



**Young geese (goslings)**



**Adult goose**

## Other Animal Life Cycles

The goose's life cycle starts with an egg. When the egg hatches, a baby gosling comes out. Soon, the offspring grows and matures. In a year, the female goose is ready to lay eggs. The life cycle is complete.

Mammals, such as mice, do not lay eggs. Baby mice grow inside the mother just like humans. The offspring are born alive. Newborn mice are pink, hairless, and blind. You can see that they are mice, but they don't look like their parents yet. In a few days, the babies open their eyes, and their fur starts to grow. In a few months, the offspring will be adults. They will be ready to continue the life cycle and have babies of their own.

The elephant's life cycle starts with the birth of a baby elephant. The baby elephant eats and grows for years. When a female elephant is 12 or 13 years old, she will have her first baby. With the birth of her baby, the life cycle is complete.

## Mouse Life Cycle



**Baby mice**



**Young mouse**



**Adult mouse**

## Life Is a Repeating Cycle

Plants, insects, fish, frogs, birds, mammals, and all other living things have life cycles. An organism's life cycle is defined by stages. The organism goes through these important stages between the time it is born and the time it produces offspring. The life cycle of the bean takes a few weeks. The life cycles of the monarch butterfly and the frog take about a year. The life cycle of the elephant takes more than 10 years. All these life cycles are different. Think about the time the life cycle takes for each organism and the stages the organism goes through. Both the time and the stages are different for every different kind of organism.



### Review Questions

1. What is a life cycle?
2. Illustrate and compare the life cycles of butterflies, frogs, and beans.



# Darkling Beetles

**D**arkling beetles are insects. They live in almost every part of the world, from the desert to the rain forest. There are many different kinds. In North America alone, there are 1,400 kinds of darkling beetles! One kind of darkling beetle is *Tenebrio*.

The adult *Tenebrio* beetle is about 1.9 centimeters (cm) long. It is dark brown to black and usually lives in dark, dry places. Like other insects, the darkling beetle has six legs and three body parts. These parts are the head, thorax, and abdomen. Like other beetles, it has two pairs of wings. The front wings cover and protect the back wings and abdomen. Even with wings, darkling beetles cannot fly.

## Life Cycle

The darkling beetle goes through four stages in its life cycle. The stages are egg, larva, pupa, and adult beetle. Female beetles lay 500 to 1,000 eggs at a time. The eggs at 1 millimeter (mm) are almost too small to see. Tiny larvae hatch from the eggs in about a week.

The larvae of *Tenebrio* beetles are a yellow-gold color. They are called mealworms, but they are not worms at all. The larvae eat cereals and grains. They grow to a length of 3 cm. The larvae molt (shed their tough outer skin) several times in order to grow. After about 3 months, the larvae change into pupae.

The pupa is a resting stage. The insect's body begins to change into an adult beetle. The pupa stage lasts about 2 weeks. Then the beetle comes out as an adult. This cycle of changes is called complete metamorphosis.



**A larva (mealworm)**



**A pupa**



**An adult *Tenebrio* beetle**

## Characteristics

Darkling beetles inherit most of their characteristics from their parents. Inherited characteristics pass from generation to generation. That's why parents and offspring look alike. Darkling beetles get their size and color from their parents. They get their head, antennae, thorax, and six legs from their parents.

Some characteristics are caused by the environment. Things can happen to change how a beetle looks. If a beetle gets into a fight, it might lose a piece of wing cover. It could even lose a leg. The beetle looks different.

If the beetle becomes a parent, what will its offspring look like? Will they have broken wing covers and five legs? No. Changes like these are caused by the environment. They are not passed on to offspring.

In the natural environment, *Tenebrio* beetles live in grasslands where there are plenty of seeds. They also make their homes near humans. They get into cupboards, pantries, and chicken farms. For this reason, darkling beetles might be thought of as pests. But they are harmless to humans.



**Darkling beetles inherit most of their characteristics from their parents.**



## Other Beetles

What makes a beetle a beetle? The most important characteristic that all beetles share is their short, hard front wings called elytra. When a beetle folds its wings, the elytra cover its entire abdomen. This shell gives a beetle its armored appearance. When a beetle flies, it lifts its elytra so that its back wings can move.

All beetles go through the same four stages of growth as the darkling beetle. Females lay eggs that hatch into wormlike larvae. The larvae eat, grow, and pupate. Finally, the pupae change into adults. At least 250,000 kinds of beetles have been described by scientists. Beetles can be less than 1 cm to more than 15 cm long.

Beetles live in just about every environment on Earth. They live in rain forests, deserts, mountain lakes, rivers, and northern forests. They can live in people's homes and gardens. They can even live in sewers. The only environment they don't live in is the ocean.

Beetles eat almost everything. Some eat leaves, fruit, bark, seeds, and grains. Others are parasites and live on or in living animals. Some beetles are scavengers, living on dead animals or dung. Beetles can be helpful to humans. For example, beetles called ladybugs are predators. They eat small insects that destroy gardens and farm plants.



**Another kind of darkling beetle**



**A metallic-green fig beetle**



**A ten-lined June beetle**