

Reflect

Manny is at his family reunion. First he catches up with his grandparents. People always tell him how much he looks like his grandfather, but Manny does not agree. His grandfather is so much taller, and his face has lots of wrinkles. His grandfather has also lost most of his gray hair. Manny got a haircut last month, and already his hair is getting long again.

Next, Manny spends some time playing with his cousin Lucia. Lucia is only one year old, but she has tons of energy. She crawls everywhere, and when she tries to stand she falls right back down. She does not seem hurt. She just laughs and tries again. Manny would love to know what Lucia is thinking, but she cannot talk yet.

Finally, Manny spots his uncle and aunt. He is amazed by the size of his aunt's belly. She is pregnant with twins. Imagine having two babies inside you! Manny feels tired just thinking about it.



Why are Manny's relatives so different? How different will Manny be when he is his uncle's or his grandfather's age? What does all this have to do with life cycles?

What are the different stages of the life cycle of living things?

A **life cycle** includes all the stages of life, from birth to death. A *stage* is just one step in this process. Manny saw people in different stages of life at his family reunion. He has already lived through some of these stages.

Let's learn more about this.



Everyday Life: Our Life Cycle

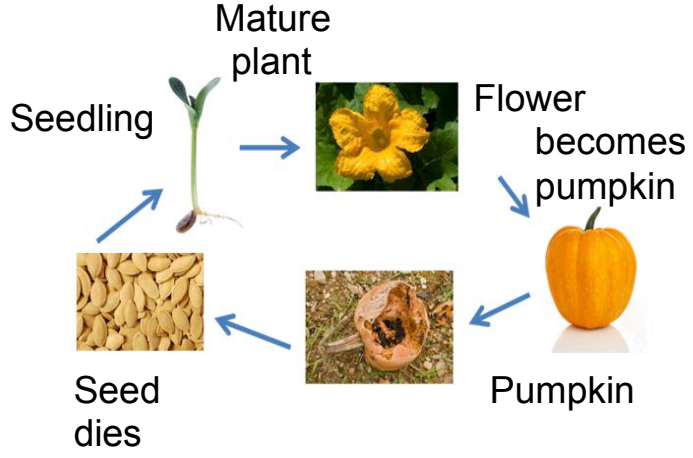
A baby is growing in Manny's aunt's tummy. Manny also started his life in his mother's tummy. When he was born, Manny was a baby. A year or so after that, he became a toddler like Lucia. Manny has grown taller as he gets older. In less than 10 years, he will be a teenager. He will finish growing tall, and he will develop stronger bones and muscles as he becomes an adult.

Reflect

After many years, he will have wrinkles and gray hair, just like his grandfather. Eventually, he will die. These stages make up the life cycle of a human being. Although the changes Manny sees happen gradually over time, we notice the differences between the stages of his family members.

The Life Cycle of Plants

All living creatures—not only humans—have life cycles. Plants, animals, and even insects have life cycles. Plants start as seeds. When a seed is planted in good soil with water, it grows into a seedling. Over time, the seedling grows into a plant. Some plants produce flowers and fruits, which contain seeds. When the plant dies, the seeds can be planted to grow new plants.



germinate: to sprout the first root from a seed

When a plant seed starts to grow, it sprouts or **germinates**. The seed stores food for the baby plant inside the seed. The first thing to grow is the main root, and then the stem and the first leaves. The seed's growing conditions usually need to be damp, warm, and dark, like springtime soil. A dry seed will stay dormant until it soaks in some water. Then it will start to germinate.

Look Out!

Take a look at the following photographs of a tomato plant's life cycle. Can you name each stage?



How can we learn about the life cycles of different plants and animals?

Scientists observe how plants and animals change over time. Each living thing has physical traits that make it unique and different from others. (A *trait* is a characteristic or property of something, such as height, weight, and skin or fur color.) The same kinds of living things have similar traits.

For example, look at the tomato plants above. As a baby tomato plant starts to grow, it looks like a small version of an adult tomato plant. Even though the seedling on the left is small, it has similar leaves, color, and shape as the adult plant in the center. All tomato plants have traits like these at each stage of their life cycles.



Many animals have babies that are just like small versions of themselves. How are the mothers and their babies alike in these photos? How are they different?

Look Out!

Not all animal babies look like their parents, so let's take a look at another animal life cycle. Frogs are examples of animals that change from birth to adulthood. Follow the pictures below, starting in the top-left corner.



A mother frog lays eggs in wet places. This mass of jelly-like eggs is called **frog spawn**. Baby frogs, or *tadpoles*, hatch from these eggs. Like fish, tadpoles breathe through gills. They have a long tail but no arms or legs.



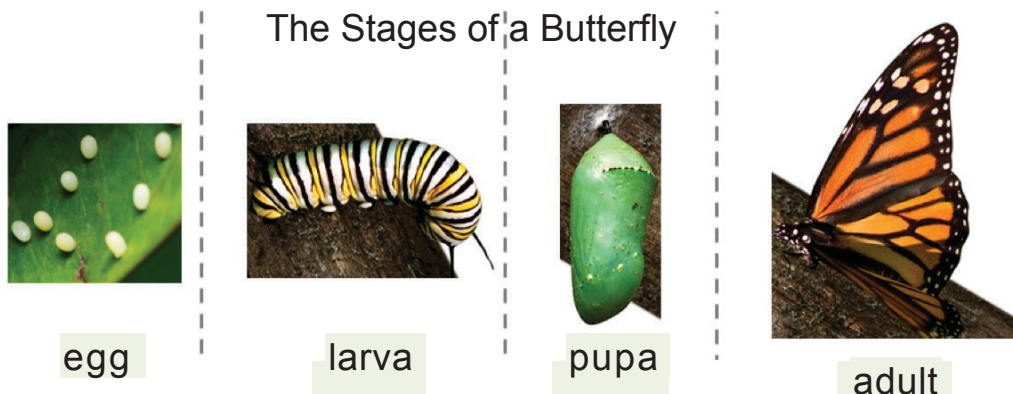
This adult frog now has lungs and breathes air. She cannot breathe under water. She will find a wet place to lay eggs. Then the tadpoles can slide into water when they are born.



As the tadpole grows, skin covers its gills. Tiny legs and arms sprout. Its tail becomes shorter and eventually disappears. It is time for the frog to climb out of the water and breathe air. This is a froglet.

Look Out!

Insects change during their life cycle. Most insects, like butterflies, beetles, and bees, have four stages. Each stage is different. When you look at an insect you can tell what stage it is in.



Egg: The first stage is the egg. Adult insects can lay hundreds of eggs. They are very tiny. Sometimes the eggs hatch right away. A mosquito egg hatches in two days! Other eggs survive all winter long before hatching in the spring.



Larva: The next stage is the larva. A caterpillar is a larva! Larvae look like short, fat worms with legs. Larvae eat a lot and begin shedding their skin when they grow. Then they grow new skin.

Pupa: After the larva grows enough, insects go into the pupa stage, in which the larva wraps itself up in a hard shell. This is called a **cocoon** or **chrysalis**. The insect does not come out for a while. It does not eat any food. It rests for a long time. But, there are big changes happening! Inside, the pupa slowly changes into an adult.

Look closely.
You can see butterfly wings inside the chrysalis!
The pupa is changing to an adult.

Adult: The insect comes out of its cocoon as an adult. Adult insects look very different from the larva that entered the cocoon. For example, a



Damselfly only have three stages in their life cycle. Eggs are laid in ponds and hatched into nymphs. Adults live above the water and can fly. Grasshoppers, dragonflies and cockroaches also only have three stages.

wiggly caterpillar enters the pupa stage, but flies out as a butterfly. Many adult insects fly away and lay eggs.

Try Now

Larva



Adult



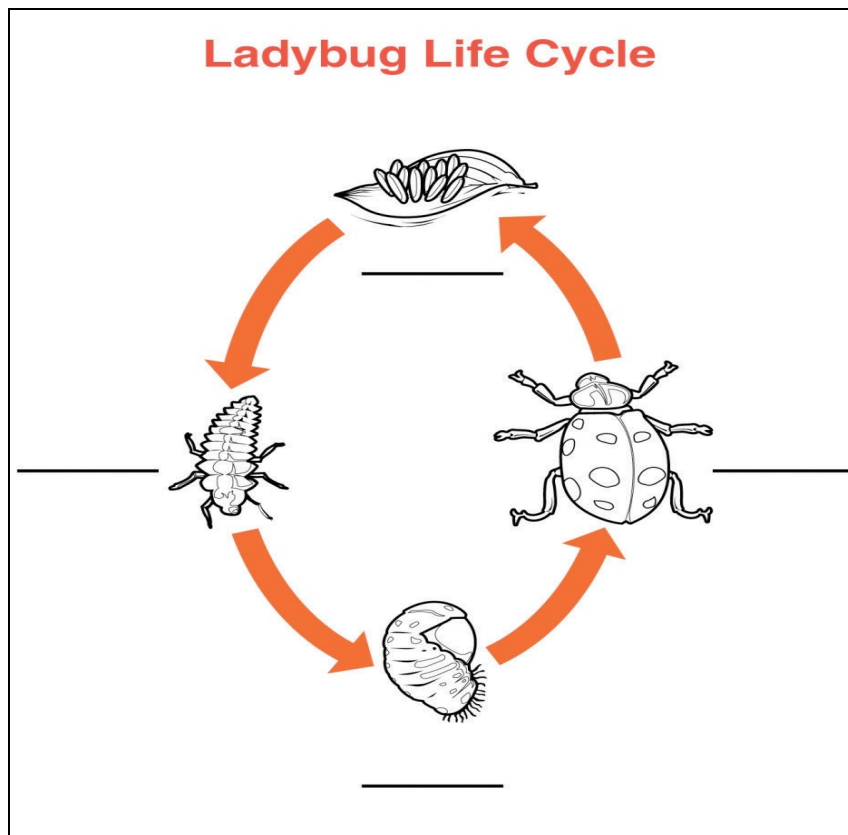
(Beetle)

There are many differences between the larva and adult beetle. Name three ways they are different.

1. _____
2. _____
3. _____

What Do You Think?

Identify each stage of the following life cycle. Then search the Internet for photographs of each stage. Color the pictures according to your photographs.



Try Now

You can catch your own tadpoles and watch them grow.

1. Find a plastic tub or fish tank, a plastic cup or container, and a bucket.
2. Collect rocks or gravel and place them on the bottom of your tub.
3. Place a large rock or two in the tub.
4. Visit a pond, small lake, or anywhere with standing water. Take an adult with you.
5. Look around the edges of the pond for tadpoles.
6. Scoop up some pond water in the bucket.
7. Scoop up the tadpoles with the cup and put them in the bucket. Try not to touch the tadpoles. The bacteria from your hands could harm them.
8. Fill the tub about three inches high with pond water. You can also use distilled or spring water. If you use tap water, let it sit about a day before putting in the tadpoles. This will allow the chlorine in the water to evaporate.
9. Make sure some of the rocks are above the water's surface. The tadpoles will need a place to go once they become froglets.
10. Place a couple of plants in the tub.
11. Include some moss and algae from the pond.
12. Let the habitat sit for a day or two. Allow everything in it to settle.
13. Gently scoop the tadpoles from the bucket.
14. Gently release them into the habitat.
15. Feed them a little lettuce every three days. You can tear the lettuce into little pieces. Freeze it overnight. Then allow it to thaw before placing a pinch of it inside the tadpole container.
16. Remove a third of the water every week and replace it with pond water or clean distilled water.
17. Watch the tadpoles turn into froglets.
18. Feed them meat as they start moving out of the water. You can feed them bloodworms or small crickets from a pet store.
19. Place a lid with vents on the tub when the frogs start coming out of the water. Otherwise, they will hop out of the tub!



Connecting With Your Child

Into the Wild

Next time you take your child to an area with wild animals—for example, a zoo, forest, butterfly house, or park—take that opportunity to focus on the life cycles of animals. Ask your child to identify or describe the life cycle stage for each animal, plant, or insect you see. Then ask your child to name the next life cycle stage for each of these living things. Point out the other people looking at the animals and ask your child about the life cycle stages of these people. Allow them to come up with creative responses. Encourage them to identify the stages based on their own prior knowledge and to support their ideas with logical evidence.

Make sure you take time to visit the nursery or the insect house if you are going to the zoo. Children love young animals, which also are perfect examples of the beginning of a life cycle. This approach will give your child an opportunity to reinforce their learning in a fun way.

Here are some questions to discuss with your child:

- How are the life stages you observed different from one another?
- Why do we name the different stages of a life cycle?
- Why do we compare life cycles of different animals, plants, and insects?
- How many stages of a life cycle can you identify in your family?