Reproduction in Plants and Animals

Reflect

Imagine a gardener checking on his growing plants at the beginning of spring. He notices a few tiny insects eating some of his plants. The gardener isn't worried—a few insects are not a concern. But when he comes back several weeks later, his plants are covered in these small insects. There are at least ten times as many insects as there were several weeks ago! Where did all of these insects come from? How do organisms make more of their species?

The tiny insects developing inside these eggs will grow into adult insects.

Reproduction produces offspring

Reproduction is a process by which an organism produces offspring, or young. All organisms reproduce. If they didn't, no species would survive past a single generation. Reproduction allows organisms to pass on their traits, or characteristics to their offspring. Parents pass on their traits through their genetic material, or DNA.

Sexual Reproduction requires two parents

Sexual reproduction requires a male and female. Each parent contributes half of their genetic material, or DNA, to their offspring. The female contributes her DNA in an egg cell. The male contributes his DNA in a sperm cell. When the egg and sperm combine, they form the new offspring.

These puppies are a product of sexual reproduction . They each have a unique mixture of their parents traits.

Offspring may look similar to their parents, but they are not exact copies. In sexual reproduction, each offspring has a mixture of its parent's traits. Parents may pass on **dominant traits** or **recessive traits** to their offspring. Each offspring may be different from its siblings. For example, suppose the father in a human family does not have freckles, but his wife does. Among their children, one child might not have freckles, but the other children might have them. In sexual reproduction, the offspring have a unique combination of their parents' traits. This is why organisms that reproduce sexually have diverse offspring.

dominant trait:
If present, determines the trait of an organism

recessive trait:
A trait that is masked if a dominant trait is present

Reflect

The process of reproduction in a flowering plant takes place in the flower. A **flowering plant** produces seeds through the process of sexual **reproduction**. The flower serves as the plant's reproductive center.

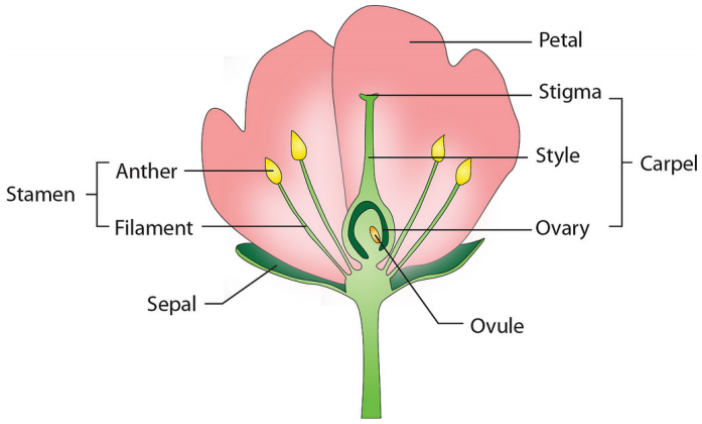
reproduction:
the process of an organism producing more of its own kind

Specific structures in each plant plays a part in plant sexual reproduction.

- **Petals** - They surround the plant's reproductive parts of the flower. Petals are usually a colorful structure arranged in a circle around the top of the stem.
- **Sepals** – Modified leaves that encase a developing flower. Sepals are the sterile parts of the flower and are usually green or leaf like.
- **Stamen** – The male reproductive organ of a flower. The stamen consists of an anther and a stalk (filament). The anther is responsible for producing pollen that contains sperm cells.
- **Pistil** – The female reproductive organ of a flower. The pistil consists of an ovary, stigma, and style. The style is a stalk structure between the ovary and the stigma. The ovary is responsible for producing the egg cells. The stigma has an adhesive area that allows the pollen from the stamen to stick to the pistil.

The flower parts of the plant function together in **pollination** and **fertilization**. Pollination is the movement of pollen from the male part of a plant to the female parts of a plant. Fertilization is the process of the male reproductive material fertilizing the ovum.

fertilization:
occurs when the male and female sex cells unite to form a seed.



The wind assists in the pollination by blowing seeds to another location. Sometimes a plant needs another organism to assist in pollination, such as bees. Animals with fur can also help in the pollination process. If an animal eats a plant's fruit, which contains seeds, the animal will release the seed in their scat.

Reflect

Asexual Reproduction

Eukaryotic organisms reproduce asexually in several ways. Fungi, such as mushrooms, form spores. *Spores* are tiny reproductive structures that contain a copy of the parent DNA. Some organisms reproduce by budding. In budding, a smaller version of the parent organism grows out of the parent. Eventually, it separates from the parent and begins to function on its own. This would be similar to another person growing out of your body!

eukaryotic: describes an organism that has cells with a nucleus and other membrane-bound organelles

Hydra are tiny aquatic animals. The hydra shown on the left is reproducing by budding. The arrow is pointing to the offspring that is growing out of the parent hydra toward the front of the image.

Asexual Reproduction in Plants

Plants can reproduce asexually through a process called **vegetative propagation**. An entire new plant can grow out of a portion of the plant. For example, if you removed a part of the stem and leaf and put it in water, it would form roots and grow to be an adult plant. It would be an exact genetic copy of its parents. Have you ever noticed the “eyes” of potatoes? The eyes are actually buds that sprout new leafy branches. This is an example of asexual reproduction. If you planted the sprouting parts, they would eventually grow into adult potato plants.

The sprouting buds of this red potato are an example of vegetative propagation.

Look Out!

Bacteria, fungi and plants are not the only organisms that reproduce asexually. In some animals, like fish, reptiles, and amphibians, an unfertilized egg can develop into a full-grown adult. This offspring would only have a copy of the female’s DNA. For example, in some insects called aphids, asexual reproduction can occur when an unfertilized egg develops inside the female. Once the egg has fully developed, the female gives birth to a genetically identical offspring!

Reflect

Increasing the Odds of Reproductive Success

Animals engage in characteristic behaviors that increase the odds of reproduction. Animals and plants develop characteristic structures and behaviors to help them survive in their environment and pass on genetic information to their offspring. It is important that the offspring be cared for and protected so they can grow to adulthood and reproduce. The continuation of a species depends on successful reproduction of offspring that will extend the generations of that plant or animal.

Nest building, herding young into the middle of a pack, sharing care, and changing shelter location to avoid predators are examples of animal behavior that lead to better chances of survival and reproductive success for their offspring. Many birds build nests for their young, but some do not. Different species of birds build different types of nests. Some nests are high up in trees and others are on the ground. Some birds build floating nests in marshes and bayous. The purpose of the bird nest is to have a protected, warm place to lay the eggs. The nest also provides a place where birds can incubate the eggs and raise their young once they hatch.

Large animals such as elephants and wildebeests move their young into the middle of the herd at any sign of predators. This defensive tactic allows the older and larger adults to protect the young animals. Elephants also live in a matriarchal group where the mother elephants group together to help each other care for their young.

Cheetahs, in contrast, raise their young alone. A mother cheetah will move her offspring every 4 or 5 days to prevent a build-up of odors that could lead predators to her den. After 18 months of teaching her young how to hunt, the siblings form their own living and hunting group.

Unique mating behavior (like croaking or singing, extending tail feathers, or giving pebbles) and mating features (colorful male bird feathers, colored chest sacs, or large cheek pads) in animals attract prospective partners to complete the reproductive cycle.

Try Now

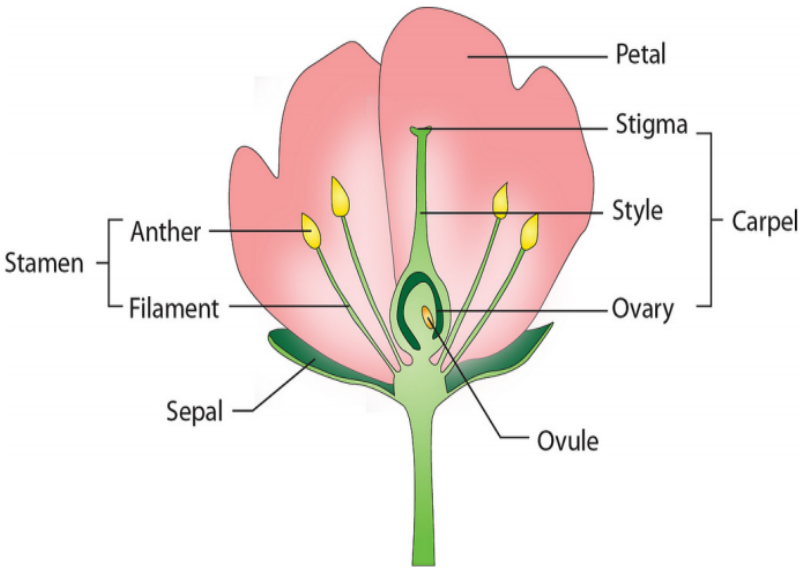
What Do You Know?

Use what you know about asexual and sexual reproduction to sort the following terms into the correct column. If the term is related to asexual reproduction, write it in the column on the left. If the term is related to sexual reproduction, write it in the column on the right. If the term is related to both types of reproduction, write it in both columns.

Terms: DNA, male and female, one parent, unique, spores, uniform, traits, egg and sperm.

Asexual reproduction	Sexual reproduction

Look at the picture of a flowering plant. Identify which parts are male structures and which are female structures.



Connecting With Your Child

Asexual Reproduction in Plants

To help your child learn more about asexual reproduction, test the vegetative propagation capabilities of a household plant. Choose a common household plant such as the spider plant (scientific name: *Chlorophytum comosum*). Try vegetative propagation using several different parts of the plant, such as a piece of stem, a piece of root, a leaf (with no stem), an leaf with some stem, and the tip of a leaf.

Place a toothpick on either side of your plant part (or in the case of the leaf, put the toothpick right through it). Then place the plant part in a cup of water and position the toothpick so a portion of the plant part is not totally submerged and that it has access to light and air. Change the water every few days to prevent it from getting stagnant. Observe how long it takes the plant to start growing, and note if the plant part does not grow at all. You and your child could also try planting the plant parts in some potting soil to see if that changes your results. You can also try this with a potato that has sprouted or with an avocado pit.

Here are some questions to discuss with students:

- Which parts of the plant successfully formed new plants?
- How does the DNA in the new plants compare to the DNA of the parent plant?
- Why might this strategy be an advantage for plants in the wild?
- How might gardeners use this method to populate their gardens?