

NATURE'S LABORATORY

*"Break open a cherry tree and there are no flowers,
but the spring breeze brings forth myriad blossoms."*

--Ikkyu Sojun

Be it a field of clover or a arrangement of irises, nothing spells out springtime like a flower in full bloom. While we might cherish flowers for their intrinsic beauty, to a plant, a flower is more than mere ornamentation. A flower is billboard, bait and breeding ground for flowers to come. For all its spangle, a flower is a costly investment for any plant, but the payoff is worthwhile. Flowers are how plants insure the daisies and daffodils of today are there to be enjoyed tomorrow.

Consider a plant. Consider a flower. For the most part, plants are green or brown, composed of leafy chlorophyll or woody bark. But flowers are something different altogether. For one thing, they're not green. Instead, they're vibrant shades of blues, reds, yellows and all the colors in-between. Why should a plant invest so much energy in an ephemeral flower?

With their vibrant colors and unique shapes, flowers are attractants for potential pollinators. Drawn to the appealing petals, a hummingbird plunges its slender bill deep into the flower in search of nectar. As its grooved tongue laps at the nectar, pollen is brushed off the anther onto the hummingbird's head and is deposited on the next flower's stigma. In this way, flowers attract pollinators to work for them.

Four major structures make up a flower: sepals, petals, stamens, and carpels. Where the flower meets the stem are the leaf-like sepals, which protect the floral bud before the flower opens. Petals, the most prominent floral features, advertise to insects and other pollinators with bright colors, some of which are invisible to the human eye.

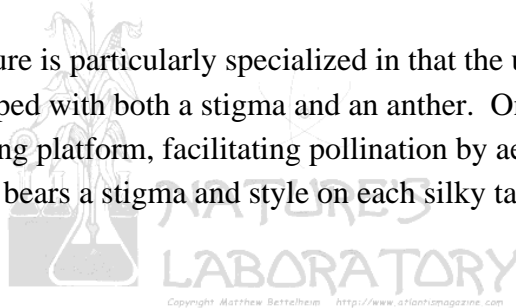
Protected within the petals lies the stamen and carpel, the reproductive parts of a flower. The stamen is made up of a pollen-storing anther which is supported by the filament. The carpel protects a plant's eggs. The ovary, located at the base of the carpel, is where eggs develop. Atop the ovary stands the style, which supports the stigma. There, the stigma's sticky surface collects pollen. After the pollen penetrates the ovary, the fertilized eggs develop into seeds. And seeds, like those nestled in an apple or those cornrowed in a sunflower's nodding head, have the potential to grow into a future apple sapling or sunflower.

As important as it is to the reproductive cycle of plants, pollen is also responsible for the bane of spring, hay fever. Also known as "allergic rhinitis" and "pollinosis", hay fever is simply an allergy to wind-borne pollens. The sneezing, swelling and itching associated with hay fever are your body's defense mechanism against an otherwise harmless intruder.

Although you probably have a mental picture of the ideal flower — an iris, or perhaps a rose — not every plant boasts such delicate buds. Irises and roses are what biologists call complete flowers. Some plants, like many grasses, have incomplete flowers. In this case, grasses lack petals.

Other flowers, like the sunflower, are deceptive. Rather than one whole flower, a sunflower is really a composite flower. If you look closely at the "flower", you'll see that the head is actually filled with hundreds of little complete flowers where, eventually, the sunflower seeds will develop. And those "petals" framing the apparent flower are actually imperfect flowers known as ray flowers.

An orchid's floral structure is particularly specialized in that the usually single stamen is fused with the style, topped with both a stigma and an anther. One petal, the lip of the flower, serves as a landing platform, facilitating pollination by aerial insects. A corn stalk, on the other hand, bears a stigma and style on each silky tassel that erupts from the end of an ear of corn.



Hands On: A garden is the ideal way to study flowers in a natural setting. Whether you plant vegetables, fruit trees or simply flowering plants, each offer the opportunity to catch a flower in action. To see the component structures of a flower, pick what you think might be a complete flower. First, inspect the flower at all angles. Identify each of the structures, noting their location in relation to each other. See if you can feel the sticky surface of the stigma. Sketch the flower, recording as much detail as possible.

Then, with the help of an adult, carefully cut the flower in half. Halved, you can see inside the ovary. Sketch the flower halves. Notice how and where each flower component buds out from the heart of the flower.

Venture out into the garden and try to find different examples of complete and incomplete flowers. If flower petals are important for attracting pollinators, why might grasses and other incomplete flowers not need petals? How else might a plant spread pollen? Could pollination strategies differ for plants that live near streams? In meadows?

Based on what you've learned, which plants are most likely responsible for hay fever, flowering plants or non-flowering plants?

Equally as interesting as the flowers to be pollinated are the pollinators themselves. From far away, you might notice hummingbirds frequenting flowers. There are still other pollinators less visible to the eye. Roam around the garden at eye-level with the flowers to see who's visiting your garden. Keep track of all the insects you find in the flowerbed. Be they bumbling bumblebees or hardworking mason bees, there are plenty of backyard visitors to watch at work.

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