What Makes an Orchid an Orchid?

Critical Thinking Questions

Orchids come in a variety of shapes, sizes, colors, and scents. They grow in soil, on trees, or even on rocks. Orchids flowers, like the flowers of other plants, play a vital role in the Orchid's life cycle. Orchid flowers attract pollinators to their reproductive structures by displaying bright colors and specially adapted labellum's (lips), using mimicry to look like another pollinator and producing amazing, although not always delightful, fragrances.

When a pollinator lands on an orchid flower, it follows the guidelines on the labellum (lip) that directs the pollinator to the nectar source. During the pollinator's trip to the nectar source, it brushes against the pollinia. This sticky ball of pollen then attaches itself to the pollinator's head or abdomen. After exiting the flower, the pollinator flies to another orchid (of the same species). Again, the pollinator follows the guidelines to the nectar source. In the process of gathering nectar, the pollinator brushes against the orchid's stigma depositing the sticky pollinia gathered from the previously visited orchid. This pollination process requires the orchid's reproductive structures be kept in close proximity. To do this, orchids have developed a unique structure called a column that combines both the pistil and stamen.

Despite their wide variety of colors, patterns, shapes, and scents, all orchid flowers share a few key traits that we can use to help identify them.

First, review your *What Makes an Orchid an Orchid* guide to learn key terms and identify the different orchid parts with *Bletia purpurea*, a terrestrial orchid that can be found in Latin America and the West Indies and the model used in the Flower Activity.

Take special notes on the three identifying features: the lip or labellum (the third petal), the pollinia and the column. These three features are used by all orchids to reproduce and attract pollinators, although they may look different on different orchid species.

After reviewing the *What Makes an Orchid an Orchid Guide*, complete the worksheet questions using the Structure Guide and the Key Terms and then make your own paper orchid using the Orchid Flower Activity!

You can share images of your paper orchids with us at gardens@si.edu.

Complete the questions below to see if you know how an orchid flower is different from other flowers.

1. The third petal of an orchid flower, called a lip or labellum, is a highly specialized structure unique to orchids. What overall function does an orchid's flower play in the orchid lifecycle? How does the shape of the Orchid's lip support the flower's function? Describe the lip of the orchid flower that you're researching. How does it perform this function?

2. While most flowers have individual pollen grains that can attach to multiple pollinators as they visit the flower, orchids have pollinia or sticky clusters of pollen that stick to pollinators as a group. Why do you think orchids evolved to have pollinia instead of individual pollen grains?

3. Most flowers have a separate stamen and pistil. Orchid flowers combine both parts into a column. How does this relate to pollination? How does it benefit orchids to have their stamen and pistil next to each other? Can you locate the column on *Bletia purpurea*?

4. The orchid flower could be described as a system. Each part of the flower works together towards a goal. Describe the different parts of this system and the goal they are working towards.

   Bonus Activity: Select three images of different orchids from the Smithsonian Gardens' digital collection. Can you locate and identify their sepals, petals, lip, column, and anther cap? Do you have a live orchid? If so, locate these features on the flower.