

Orchidaceae

Orchidaceae is one of the two largest families of flowering plants. The current accepted theory is that Orchidaceae arose in the Mid-Cretaceous Period, about 112 million years ago (MYA). This means that orchids were alive with the dinosaurs. After the Cretaceous-Paleogene extinction event, which occurred 65 MYA, Orchidaceae expanded rapidly into the vacated niches.

Today, there are over 880 different genera and almost 28,000 different species. The *Vanilla* genus is one of the oldest orchid genera still surviving and is thought to have arisen about 80 MYA. The *Vanilla planifolia* is a vine found in Central America and Mexico. Its seed pods are used to produce the majority of vanilla extract sold today. The reason pure vanilla extract is so expensive is because the *Vanilla planifolia* flower only opens for one day. Workers must hand fertilize each flower as they open.

Orchids are **perennial herbs**, which means they grow for more than one year and have no woody structures. Orchids can be classified by where they grow. **Terrestrial** orchids grow in the ground and **epiphytic** or **lithophytic** orchids grow in the air attached to trees or rocks. This last type of orchid does not need soil around its roots. It produces **aerial roots**, which grow out into the air to absorb moisture.

Orchids can also be classified by how they grow. **Monopodial** (meaning “one foot”) orchids grow upwards from one stem. New growth appears at the top. The *Vanilla planifolia* is classified as a monopodial vine. **Sympodial** orchids grow outward. New shoots appear from a horizontal stem, called a **rhizome**.

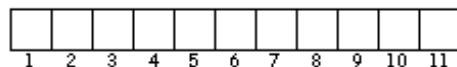
Three major evolutionary adaptations occurred that allowed orchids to grow the way they do. First, most orchid genera grow very slowly to conserve water and nutrient usage. The exceptions to this are the native orchids of the temperate, or colder, climates. These orchids are all terrestrial, and like the other flora of those climates, need to grow rapidly when their growth season arrives. Second, orchids can absorb water and nutrients through their leaves, as well as their roots, to take up as much of these resources as possible when they become available. Water and nutrients are then stored in the leaves and roots of monopodial orchids and in the **pseudobulbs**, or storage structures, and roots of the sympodial orchids. Finally, orchids have **velamen**, a sponge-like substance, around their roots to store the water and nutrients until needed and to help prevent water loss. The actual orchid root is about the thickness of fishing line and runs down the center of the velamen.



Vanilla planifolia

Orchidaceae Word Puzzle

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One of the two largest families of
flowering plants.

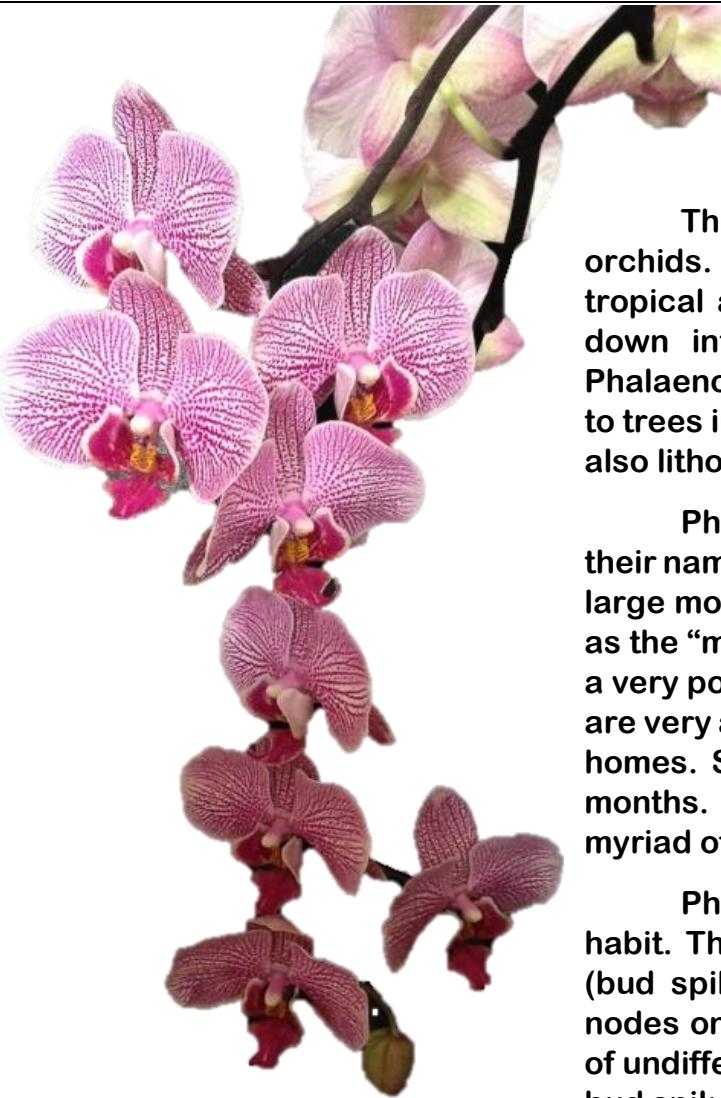
aerial root
epiphytic
herb

lithophytic
monopodial
perennial

pseudobulb
rhizome
sympodial

terrestrial
velamen

1. Use the clues on the right to unscramble the words on the left. Put one letter in each square. Use the word bank at the bottom
2. Copy the letters in the numbered squares to the correct cell at the bottom.



Phalaenopsis

(fail-eh-NOP-sis)

There are about 60 species of Phalaenopsis orchids. These orchids are native to the topical and sub-tropical areas of southeastern Asia, China, Taiwan and down into northern Australia. The great majority of Phalaenopsis orchids are epiphytic plants living attached to trees in the shade under the canopy. A few species are also lithophytic.

Phalaenopsis orchids are thought to have gotten their name because they resembled the obsolete genus of large moths called *Phalaena*. This is why they are known as the “moth orchid”. Phalaenopsis orchids have become a very popular houseplant for several reasons. First, they are very adaptable to the growth conditions found in most homes. Second, their blooms can last from one to four months. Third, they have been hybridized to produce a myriad of colors and patterns.

Phalaenopsis orchids have a monopodial growth habit. They often produce a long, flowing inflorescence (bud spike and flowers). The bud spikes emerge from nodes on the stem between the leaves. Nodes are areas of undifferentiated cells that can become leaves, roots or bud spikes.

Phalaenopsis Care Instructions

Light: Provide bright light, but not direct sunlight. An east or west facing window is best. Shaded south facing windows can also be used. The leaves should be a medium green. If the leaves become darker, it needs more light. If the leaves turn yellow or develop white patches, it's getting too much sun.

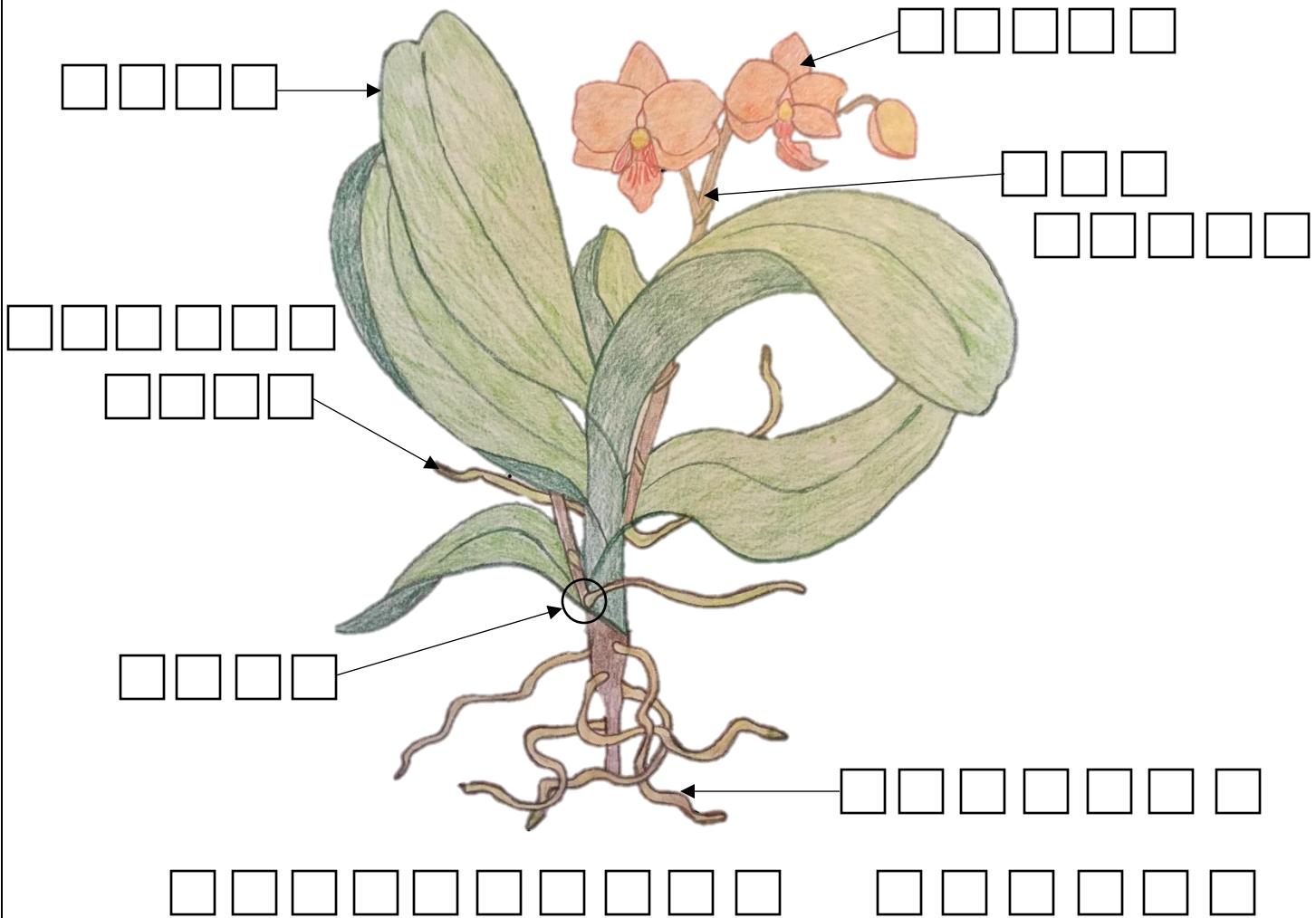
Temperature: The ideal temperature range is 75 °F to 85 °F, although most of these orchids grow very well in normal household temperatures of 70 °F to 75 °F. They like cooler nighttime temperatures as low as 60 °F. Nighttime temperatures down to 55 °F in the fall are what cues this orchid to begin budding.

Water: Because these orchids have no real water storage structure, the plant should never completely dry out. However, because their roots are covered in the sponge-like velamen, they don't like sitting in water either. Too much water will rot the roots. Thoroughly water the plant every 5 to 7 days when the media is just about completely dry. Make sure the water can drain from the pot.

Humidity: These orchids prefer a humidity of 50% to 70%, but can tolerate a normal household humidity of about 40%.

Fertilize: Fertilize twice a month with a good orchid fertilizer (19-4-23).

Fill In The Blanks



Glossary

Aerial Roots – roots that grow out into the air.

Bloom – all orchid flowers have 3 sepals, or outer petals, and 3 petals. One of the petals is modified into a labellum or lip. Sometimes these sepals and petals may be fused together.

Bud Spike – a long stem that produces flower buds, possibly with branching.

Inflorescence – the combination of a bud spike and the flowers.

Leaf – leaves on monopodial orchids are usually larger and thicker to store water and nutrients for the orchid

Monopodial Growth – a vertical growth pattern with a single stem. New growth appears at the top.

Node – an area of undifferentiated cells that can develop into leaves, roots or bud spikes

Velamen – a sponge-like substance surrounding orchid roots that absorbs and stores water and nutrients.