



CONSERVATORY OF FLOWERS

GOLDEN GATE PARK • SAN FRANCISCO

Exploring Rainforest Adaptations

What are Adaptations? Background information for the teacher.

An adaptation is the way a plant species has changed over generations to better survive in its environment. Certain plants have special characteristics to help them survive in the wet, hot, and crowded tropics.

Students sometimes assume an adaptation develops over the lifespan of a single plant. We therefore avoid referring to a plant as “adapting”, which infers that the plant actually thinks about adapting and then takes action to do so. Instead, we talk about the adaptation as a characteristic or structure that has developed over many thousands of generations of plants.

Adaptations help meet the basic needs of a plant species. At the Conservatory, we use the word “SWAN” to help us remember the 4 things that all plants need to survive:

- Sunlight manufactures food energy through the process of photosynthesis.
- Water, usually taken up through the roots, helps the plant move nutrients through the plant.
- Air is necessary for the photosynthesis process. It allows the plant to take in carbon dioxide and release oxygen.
- Nutrients from the soil and decaying plants and insects are absorbed through the roots and help the plant grow strong.

Below are a few examples to discuss with your students. (Corresponding photos to show students are included.)

Problem: No access to ground water.

Resulting Plant Adaptation: Plant stores water.

The rain forest is so crowded that plants live anywhere there’s space. Some orchids are epiphytes, which means they live on other plants instead of on the ground. Because their roots are not in the soil they are unable to collect ground water. These orchids have an adaptation called a pseudobulb, which is a thick part of the stem that stores water. Water is drawn up from the roots, which are exposed rain and covered in a spongy material. Water is then stored in the pseudobulb for when water is scarce.

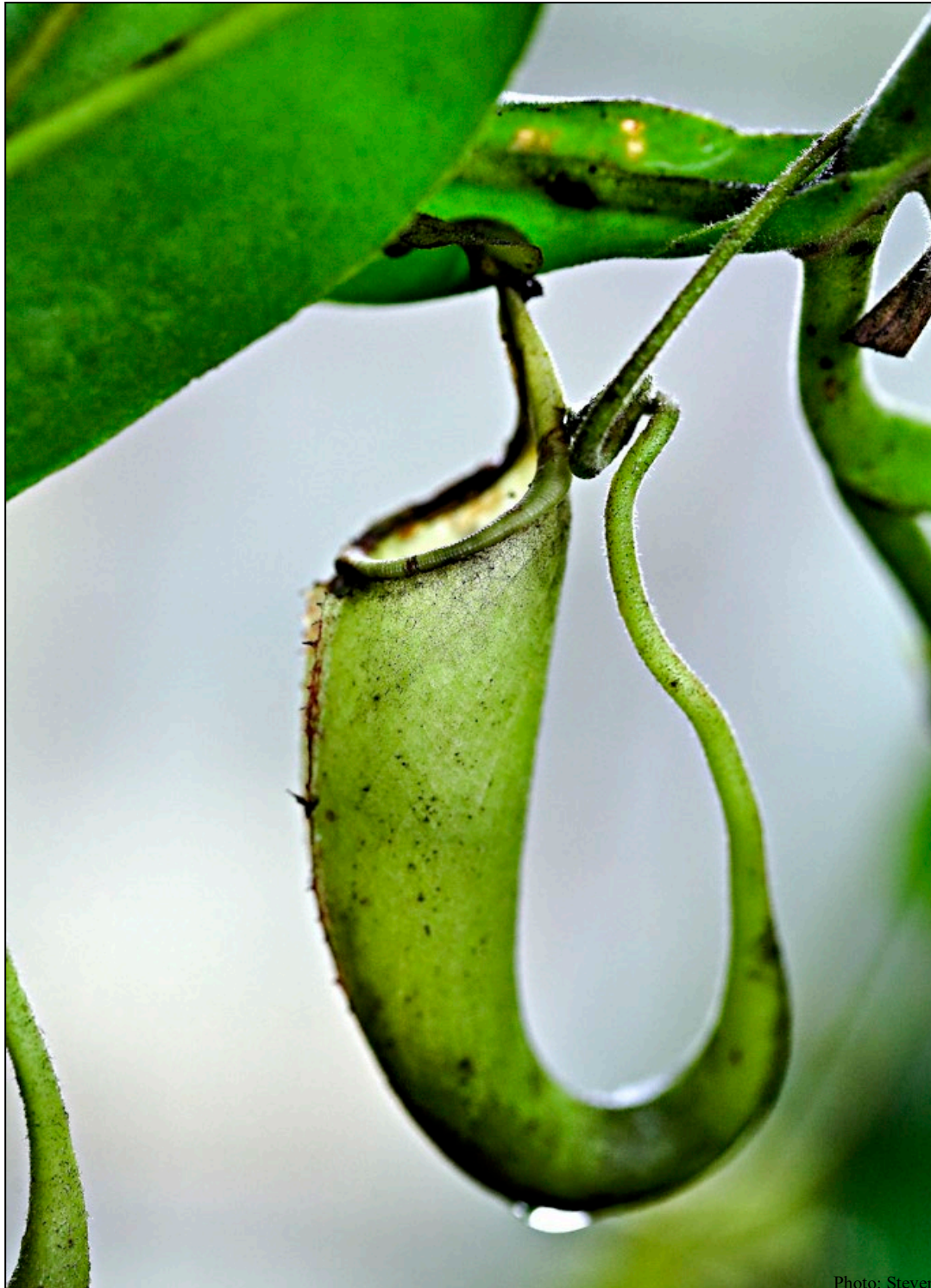
Orchid Pseudobulb



Problem: Lack of nutrients in soil.

Resulting Plant Adaptation: Carnivorous plants get nutrients through decaying insects. The tropical pitcher plant lives in soil that has very little nutrients so this plant species gets their nutrients from insects. The adaptation is in the leaf structure. Over many thousands of years, the pitcher plant has developed modified leaves, called a “pitcher”, that insects fly or crawl into, but can not crawl out of. The carnivorous plant then absorbs the nutrients of decaying insect.

Pitcher Plant



Vocabulary Words

Adaptation An adaptation is the way a plant species has changed over generations to better survive in its environment.

Carnivorous Plant Plant that gets nutrient by trapping and digesting insects and small animals.

Cloud Forest A tropical forest near mountains that is usually covered in clouds.

Environment The conditions that surround plants, animals, and people, including weather, soil, and light.

Epiphyte A plant that grows on other plants. In Latin, “epi” means “on” and “phyte” means “plant”.

Equator An imaginary line around the center of the earth that divides the Northern and Southern Hemispheres.

Habitat The natural environment in which an animal or plant usually lives.

Humidity The amount of water vapor in the air.

Nutrients Elements that provide food for plants.

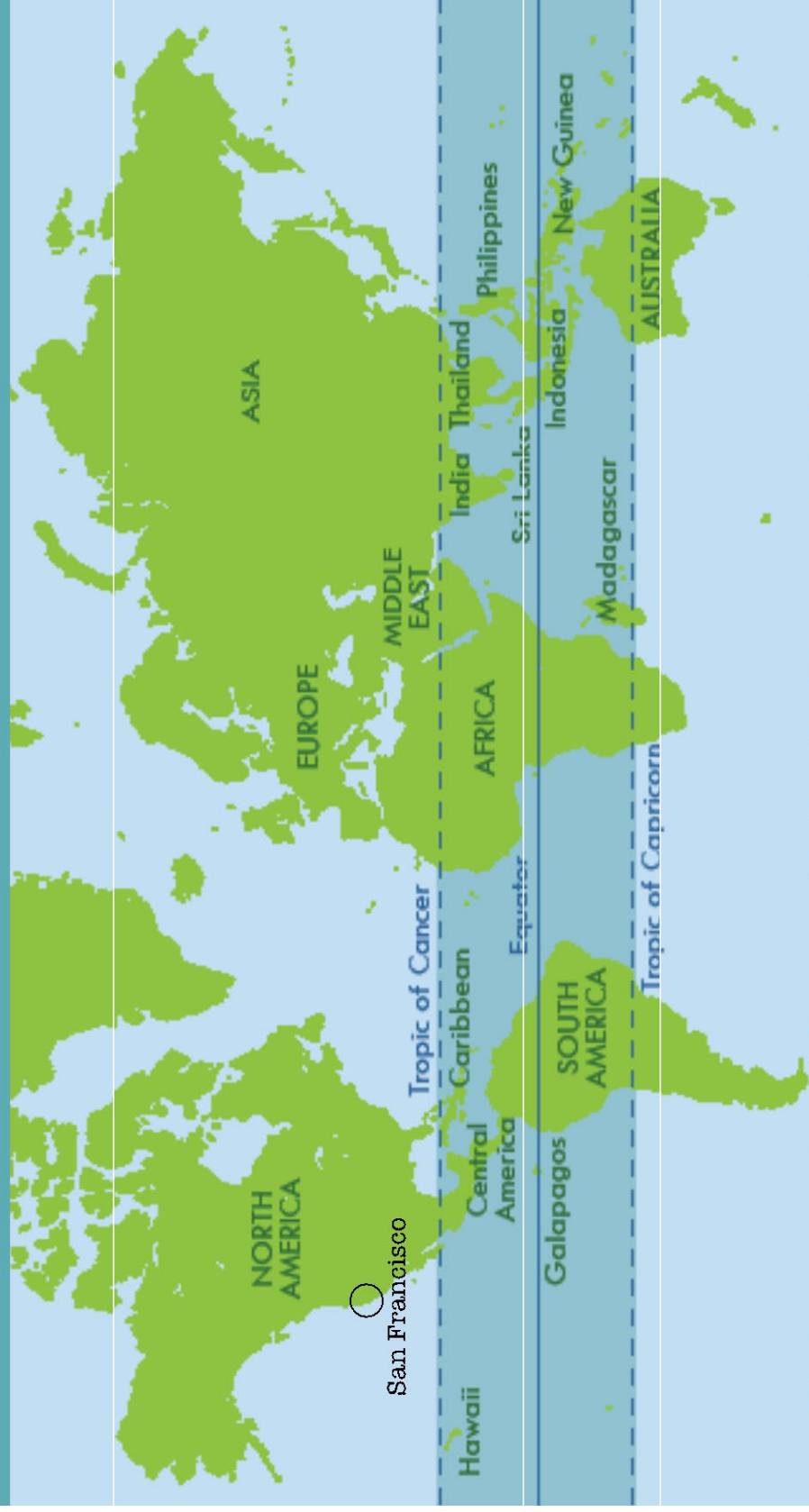
Pseudobulb The part of some orchids that stores water.

Rain Forest A tropical forest with very tall trees and over 100 inches of rainfall every year.

Temperature How hot or cold the air is.

Tropics The regions of the Earth that are near the Equator, between the Tropics of Cancer and Capricorn.

Map of the Tropics



The Tropics are located between the Tropic of Cancer and the Tropic of Capricorn.

Share what you learned!

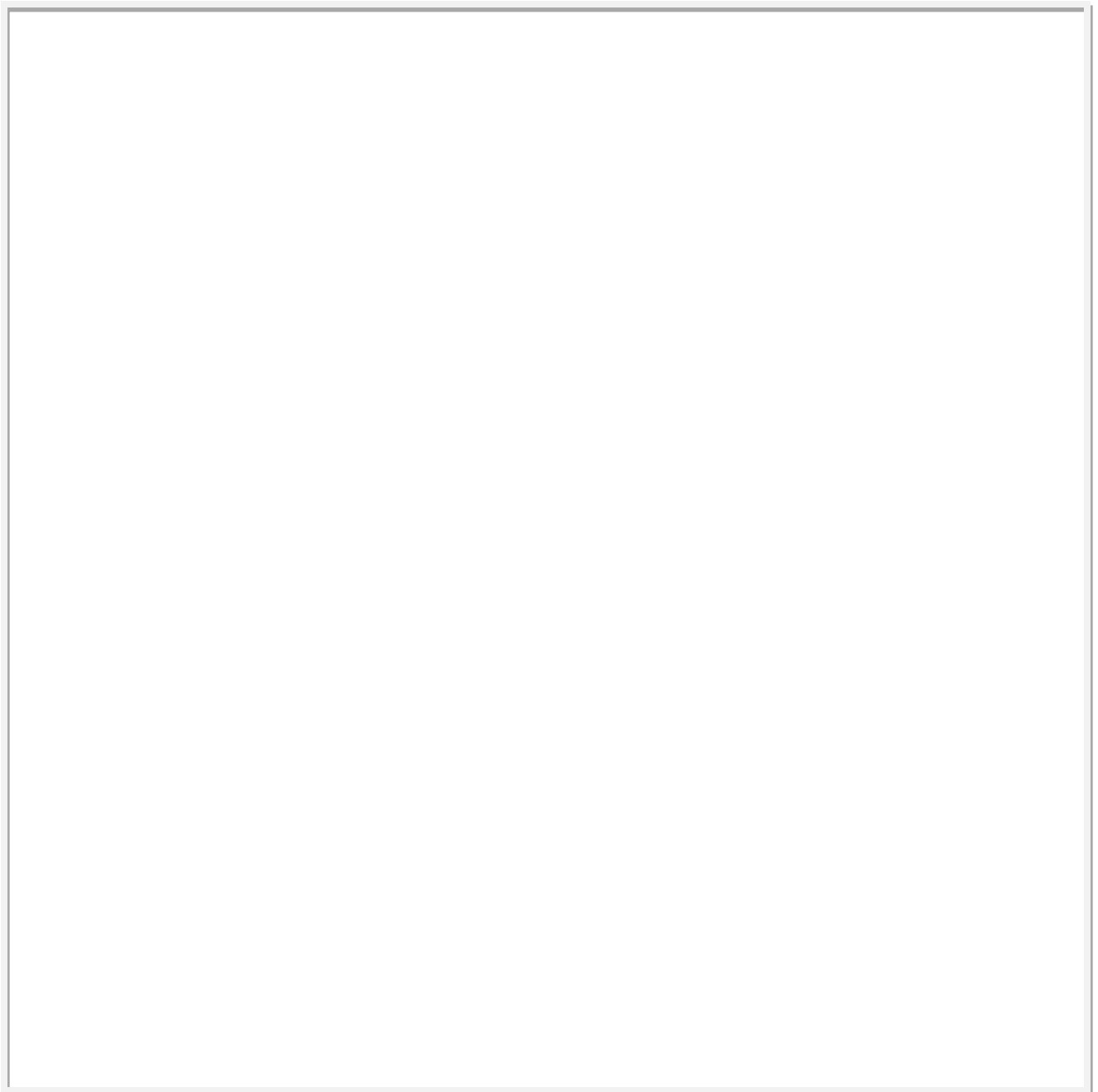
If you could design a plant, what three adaptations would it have?

1) _____

2) _____

3) _____

Draw what your plant would look like.

A large, empty rectangular box with a thin black border, intended for drawing a plant. The box is positioned below the text 'Draw what your plant would look like.' and occupies the lower half of the page.