

THE THEMED RESOURCE GUIDEBOOK:  
**INTRO TO PLANTS**

See the back of this card for instructions on how to use this guide!



GARFIELD PARK  
CONSERVATORY  
ALLIANCE 

# TABLE OF CONTENTS

**How to Navigate Your Experience** – An explanation of how to use the cards for each plant you will observe through the guidebook today.

**What is a Plant** – Provides adults with background on what a plant is, as well as qualities that are common to most plants.

**Plants and their Functions** – Provides adults with details regarding the functions of the six main plant parts.

**Plants by Room** – A master list of all of the plants included in the experience. The plants are organized by room.

**Plant Info Pages** – Each card is a stop where you and your students will learn about a different plant!

**Reflection Questions** – Continue the conversation about plants with your students!

**Intro to Plants Vocabulary** – Adults: brush up on old vocabulary and learn some new terms! Refer back to these cards throughout your time at the Conservatory today.

# HOW TO NAVIGATE YOUR EXPERIENCE

ANYTHING IN **GREEN** CAN BE READ DIRECTLY OUT LOUD TO YOUR STUDENTS!

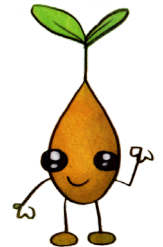
## On the **FRONT** of each card, you will find...

- The room in which the plant is found.
- The name of the plant.
- Where the plant comes from.
- A photograph of the plant.  
\*\*Not all plants may be flowering at the time of your visit!
- A map of the room where you can find the plant, which includes a orange dot to direct you to its specific location.
- A blurb that you can read to your students!

## On the **BACK** of each card, you will find...

- The type of plant part (leaf, fruit, stem, flower, or root).
- Questions you can pose to your students. Encourage your students to ask questions, as well.
- Answers to those questions that will teach you about different plant parts and functions!

I'm Squiggy! Keep an eye out for me throughout the guidebook, because I'm going to help guide you through the Conservatory today!



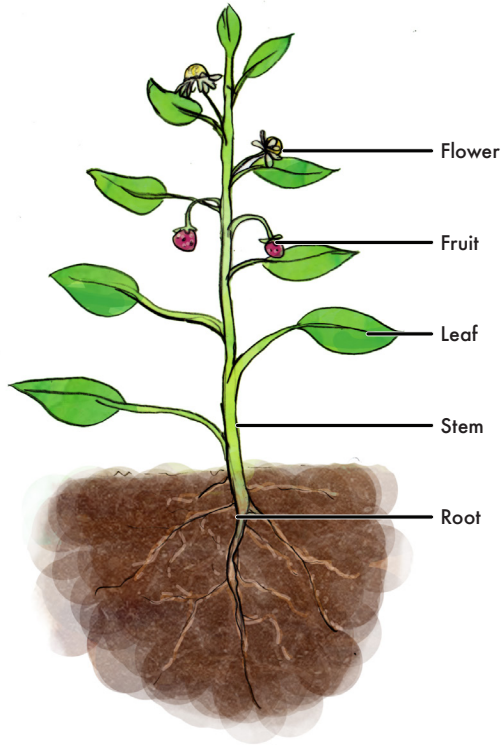
# WHAT IS A PLANT?

Plants are the foundation of all ecosystems (an ecosystem is all of the living and non-living things interacting in an area!). Without plants, there would be no life on Earth, as plants are the only things that can harvest energy from the sun to make food. Most living creatures living on earth rely on plants for food, oxygen, shelter, tools, medicine, and more. The incredible diversity of plants supports all of our various needs.

Most plants are multicellular, eukaryotic, photosynthesizing organisms. In other words, they are made up of more than one cell, are made of complex cells, and make their own food using energy from the sun. This definition is so broad because plants are extremely diverse. For example, not all plants exclusively use photosynthesis to make their own food. A Venus flytrap, for example, does photosynthesis but its main source of food is insects, which the flytrap catches and eats, just like we eat food! Some plants make their own food without using the sun, so technically they are not performing photosynthesis. These plants live at the bottom of the ocean near big vents that emit gases; the plants here use the chemicals from the gases to make food in a process called chemosynthesis.

In this guidebook, we focus on the plant basics: what are the different structures that most plants have and what are the functions of those parts?

# PLANT PARTS AND THEIR FUNCTIONS



## Roots

Roots have two very important jobs! 1) They absorb water and nutrients from the soil that can then be delivered to the rest of the plant. 2) They also hold the plant firmly in place; without roots, plants would just fall over!

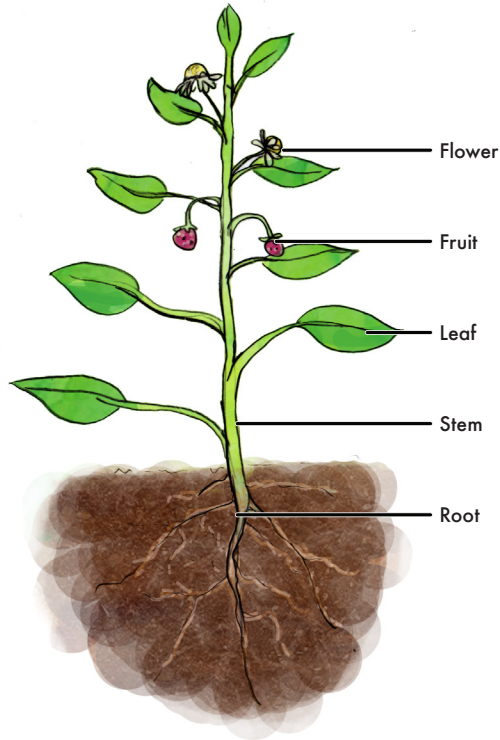
## Stem

Stems help with plant structure. Like roots, they help keep plants standing straight and tall! Stems are also like a highway in a plant: food, water, and nutrients are transported to different parts of the plant through the stem.

## Leaf

Instead of eating food for dinner like you do, plants use light energy from the sun to make their own food. This is called photosynthesis and it takes place in the leaf. There is a special chemical found in leaves called chlorophyll that captures sunlight and is also what makes plants green!

# PLANT PARTS AND THEIR FUNCTIONS CONT.



## Flower

The bright colors and sweet smells of flowers are meant to attract birds, insects, and bats to come drink the flowers' nectar. When these animals and insects drink the nectar from a flower, they unwittingly brush up against pollen. Then, when the animals and insects visit a different flower, the pollen from the first flower will fall off onto the second flower. This is called pollination. Once a flower has been pollinated, fruit and seeds can grow!

## Fruit

Aside from being delicious, the fruit of a plant protects the plant's seeds. Fruit also helps the plant disperse its seeds! When animals eat fruit, they often swallow the seeds. Later on, they expel the seeds from the fruit in their waste. This is how new plants can grow far away from the original plant!

## Seed

Seeds are plant embryos! When pollination occurs, the pollen grain from one plant fertilizes an egg from another plant. That egg becomes a seed. When a seed is planted in the right conditions, the seed will eventually start to sprout!

# PLANTS BY ROOM

Today, you will explore our plant collection. In each room in the Conservatory, you will learn about a different plant part and function! We also have some plants that are extremely different and just, well, wacky!

<b>PALM HOUSE</b>	Formosa Palm, Flaming Sword
<b>FERN ROOM</b>	Bird's Nest Fern, Samoan Tectaria
<b>SUGAR FROM THE SUN</b>	Papyrus, Calamondin Orange Tree, Papaya Tree, Chocolate Tree
<b>CHILDREN'S GARDEN</b>	Gardenia, Pink Powder Puff
<b>DESERT HOUSE</b>	Totem Pole Cactus, Chin Cactus
<b>AROID HOUSE</b>	Lobed Aroid, Sensation Peace Lily

Last but not least, check out our cool carnivorous plants! You can find our pitcher plants in Sugar from the Sun all year round and our Venus flytraps outside in the Sensory Garden during the summer.

# WORDS TO DESCRIBE PLANTS

Soft

Pointy<sup>★</sup>

Short

Colorful

Tall

small

Fuzzy

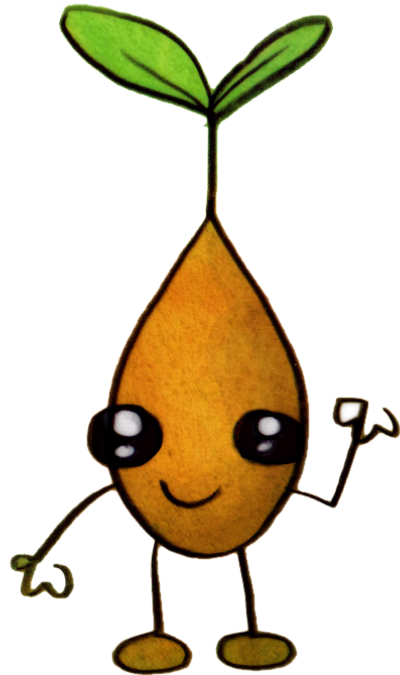
ROUND  
ROUND  
ROUND

Long

**HARD**

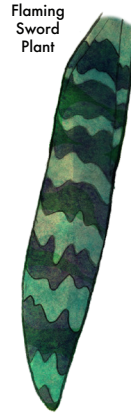
Green



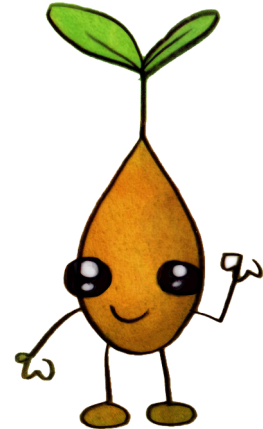


I'm so excited to learn about  
different plants that grow at  
the Conservatory.  
Let's get started!

# LET'S LEARN ABOUT LEAVES IN THE PALM HOUSE!



Leaves come in lots of shapes and sizes! Let's see what kind of leaves we can find in the Palm House!

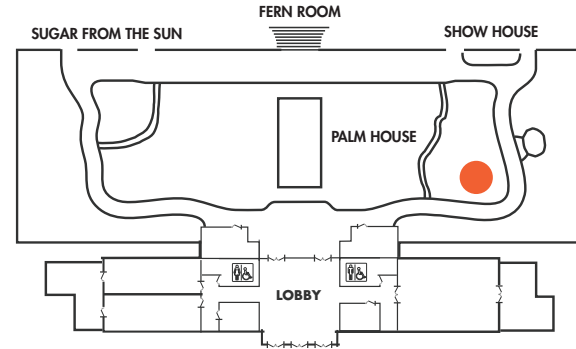


# FORMOSA PALM

**Where it grows:**  
Taiwan, Ryukyu Islands



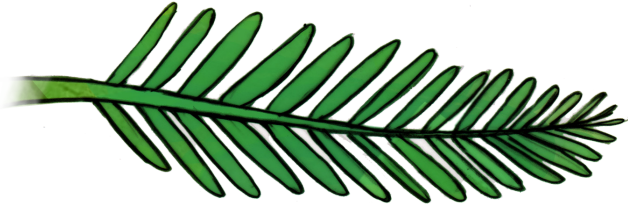
## PALM HOUSE



Use one finger and gently touch the leaves of the Formosa palm. What do they feel like? Take a step back and look at the whole leaf - does it remind you of anything...bird-like? The leaves on the Formosa palm look like feathers of a bird! Palm leaves, or "fronds," grow in three main patterns: feather, fan, and fishtail. The Formosa palm fronds are a great example of the feather pattern.

# FORMOSA PALM

## Plant Part: Leaf



I wonder...

### Are the leaves big or small?

The leaves of the Formosa palm are big so that a LOT of sun can shine on them!

### What color are the leaves?

The leaves are green. Most leaves on a plant are green. This is because of a chemical inside the leaves called chlorophyll. Chlorophyll uses sunlight to make delicious food for the plant – when plants make their own food, we say they are doing photosynthesis!

### Why do you think plants need leaves?

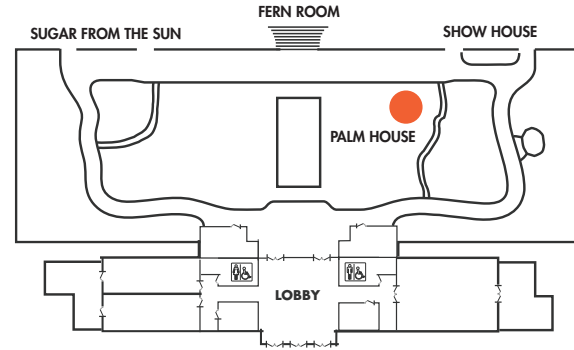
Plants need leaves to do photosynthesis! Without leaves, plants would not be able to use sunlight to make food.

# FLAMING SWORD

**Where it grows:**  
Trinidad



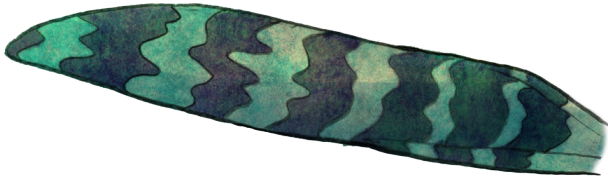
## PALM HOUSE



We do not want to touch this plant because it can be sharp and pointy! Instead, pretend you have binoculars or a magnifying glass to get a good look at this plant. What do you see?

# FLAMING SWORD

## Plant Part: Leaf



I wonder...

How are these leaves different from the leaves on the Formosa palm tree? Are they the same size and shape?

These leaves are much smaller than the leaves on the Formosa palm! The leaves on the flaming sword are arranged in a circle to create a cup in the center of the plant! Their cups are a lot like the ones you use for milk or juice, except they're only meant to hold water for the plant to drink!

What stands out to you when you look at this plant?

There is something big and red shooting up from the middle of the plant! It is actually a leaf! It is big and red to attract pollinators to come drink the nectar from its little, yellow flowers! (note to facilitators, the plant is not always flowering, so you may not always see the "sword"!)

Why do you think this plant is called the flaming sword?

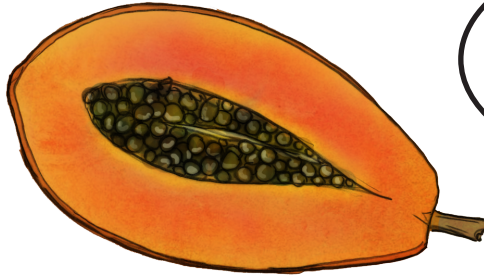
This plant is called the flaming sword because of the big, red leaf - it looks like a sword that is on fire!

# LET'S FIND OUT ABOUT FRUIT IN SUGAR FROM THE SUN!

Calamondin  
Orange

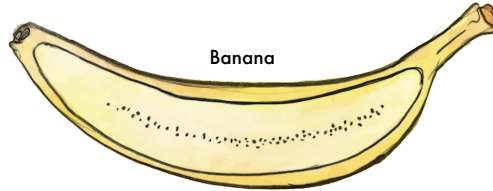


Papaya

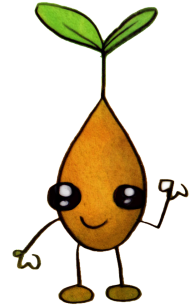


Cacao Pod

Banana



Fruits are so delicious!  
But did you know they're  
also really important for  
making new plants?



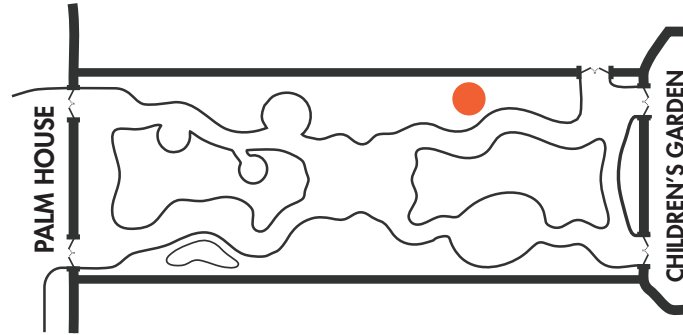
# PAPAYA

## Where it grows:

South America



## SUGAR FROM THE SUN

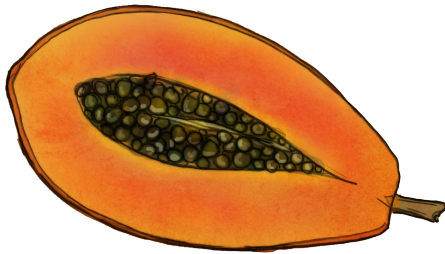


Look up! Do you see the papaya fruit hanging from the tree? Pretend to be an explorer by walking on the stone path to get a closer look! What do you think the fruit tastes like?



# PAPAYA

## Plant Part: **Fruit**



I wonder...

### Who do you think likes to eat papaya fruit?

Many animals eat papaya, including tropical birds, monkeys...and people!

### What do you think is inside the fruit?

If you slice open a papaya, you will find smooth orange fruit flesh, as well as many tiny black seeds. Seeds are usually found in the middle of a fruit so that the skin and flesh protect it, kind of like a helmet protects your head. Can you think of a fruit you like to eat that has seeds in the middle?

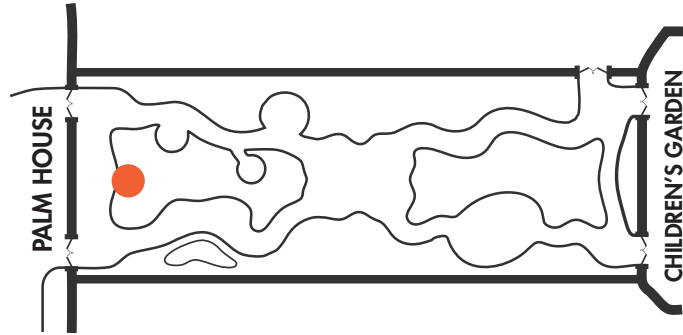
# CHOCOLATE TREE

## Where it grows:

Central America



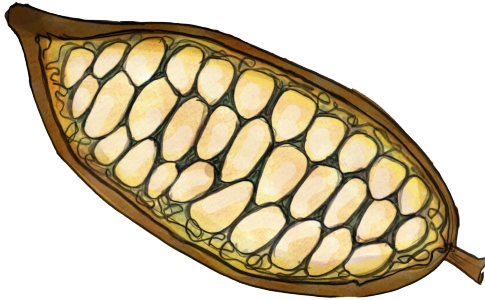
# SUGAR FROM THE SUN



Did you know that chocolate comes from trees? Sure enough, we make chocolate from the seeds that are found inside the fruit of the chocolate tree! We call the fruit "cacao pods." Look closely to see if you can find any cacao pods growing on our tree - they look like tiny, green footballs!

# CHOCOLATE TREE

## Plant Part: **Fruit**



**I wonder...**

**Do you see the flowers on the chocolate tree? Where do they grow?**

The flowers are tiny and white, and they grow straight from the trunk and branches of the tree! (note to facilitators, the plant is not always flowering)

**What do you think the chocolate fruit tastes like?**

The inside flesh of a cacao pod is white and slimy, just like boogers! However, this white substance actually tastes fruity and delicious - monkeys, rats, squirrels, and humans love to eat it!

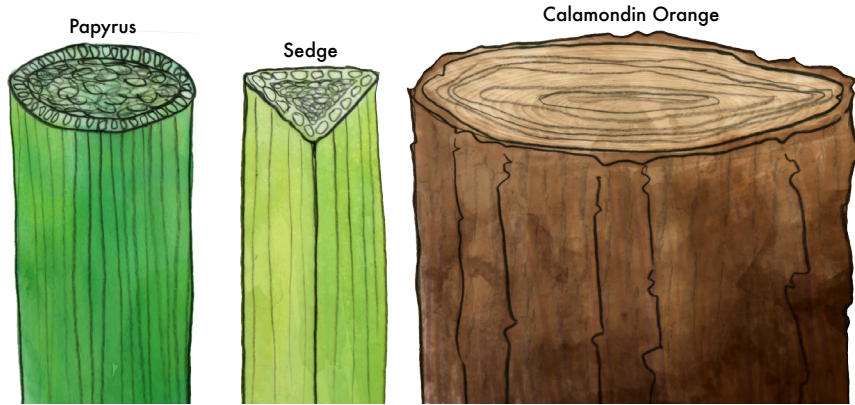
**How do you think new chocolate trees grow?**

The tastiness of the fruit helps the plant spread seeds: when animals eat fruit, they throw the seeds on the ground or swallow them and poop them out later. The seeds will then grow into new plants!

**How do we turn seeds into chocolate?**

Making the seeds into the chocolate bars we know and love is hard work! First you have to dry and roast the beans. Then, the beans are sent all over the world, where other ingredients are added to make it sweet and delicious!

# LET'S STUDY STEMS IN SUGAR FROM THE SUN



People like you have bones for support, but plants have stems.



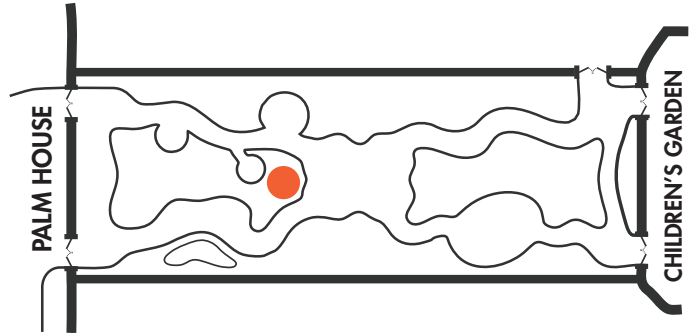
# PAPYRUS

**Where it grows:**

Africa



## SUGAR FROM THE SUN



What a funny looking plant! Gently touch the top, poofy part and then the long, hard stem. Did you know that we used to make paper from the stem of this plant?

# PAPYRUS

## Plant Part: **Stem**

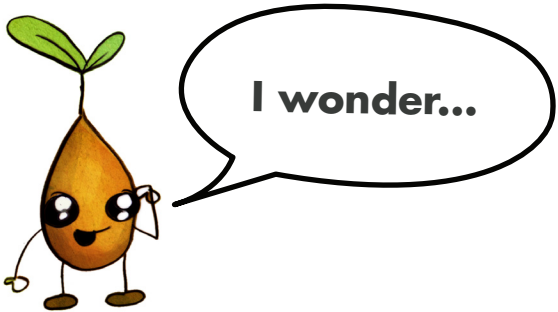


### What does it look like the stem is doing?

Papyrus stems (and all other plant stems!) help keep the plant standing straight and tall.

### What do you think is inside the stem?

Stems help bring water and nutrients to all parts of the plant! Inside the stem, there are long tubes. These tubes are how water, food, and nutrients get from one place in the plant to another.



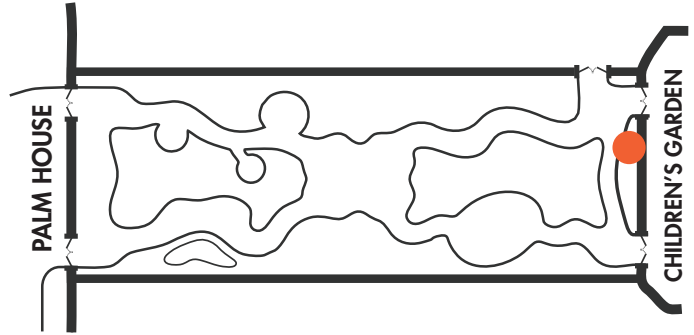
# CALAMONDIN ORANGE TREE

**Where it grows:**

Philippines



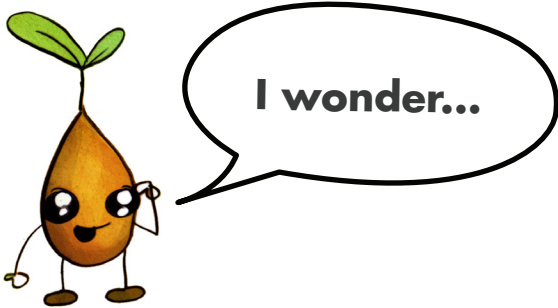
## SUGAR FROM THE SUN



What kind of fruit do you think grows on this tree? That's right - oranges! Please do not try to pick them; we want all of our visitors to be able to see the beautiful fruit!

# CALAMONDIN ORANGE TREE

## Plant Part: **Stem**



What does the stem (or trunk!) of the tree feel like?

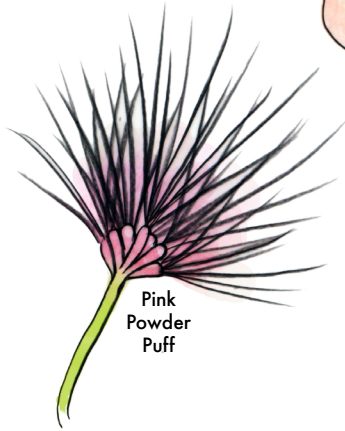
The trunk probably feels hard and a little bit rough.

How is it different from the stem of the papyrus? If you can't remember what the papyrus stem feels like, you can go back to touch it again!

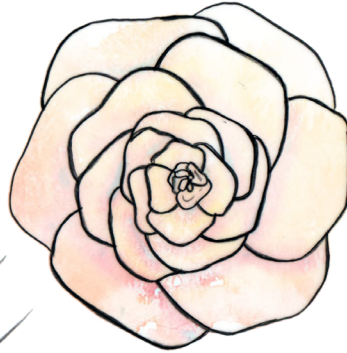
As you may have noticed, the stem of the calamondin orange tree has bark, while the stem of the papyrus does not. Plants that are bigger, like trees, often have bark because bark strengthens the stem and protects trees from storms, disease, and fire. Even though the stems of the calamondin orange tree and the papyrus look different, they have the same important jobs: helping the plant stand up straight and allowing food, water, and nutrients to travel throughout the plant!



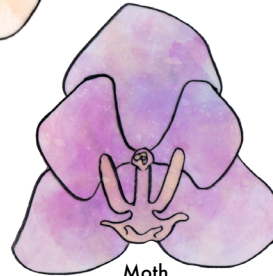
# LET'S FIGURE OUT FLOWERS IN THE CHILDREN'S GARDEN!



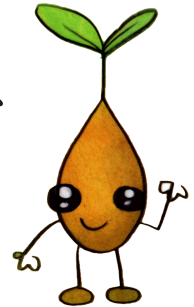
Pink  
Powder  
Puff



Gardenia



Moth  
Orchid



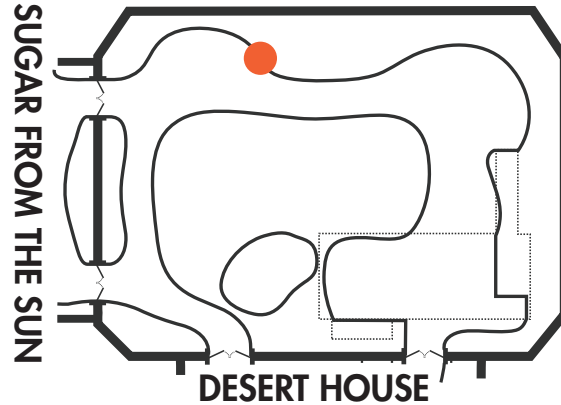
# GARDENIA

**Where it grows:**

Polynesia



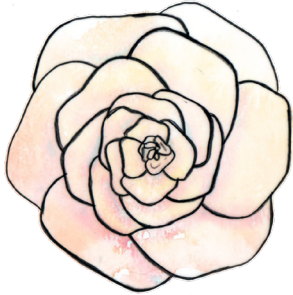
## CHILDREN'S GARDEN



Smell the gardenia flower! What does it smell like? Many lotions and candles have a gardenia scent because so many people love it!

# GARDENIA

## Plant Part: Flower



I wonder...

### How do you think flowers help the plant?

Flowers' sweet smells attract birds, bats, bees, butterflies, and other insects to come drink the flowers' nectar. When these animals drink the nectar from a flower, they brush up against its pollen. Then, when the animals and insects visit a different flower, the pollen from the first flower falls off the animal or insect onto the second flower. This is one way plants are pollinated, which is required before fruits and seeds can grow!

### What does the gardenia smell like?

The gardenia flower smells very, very sweet!

### Why do you think the gardenia smells the way it does?

Sweet flower smells attract pollinators. The gardenia's strong, sweet smell and snow white color attract moths. When the moths drink the nectar from different gardenias, they spread pollen from flower to flower!

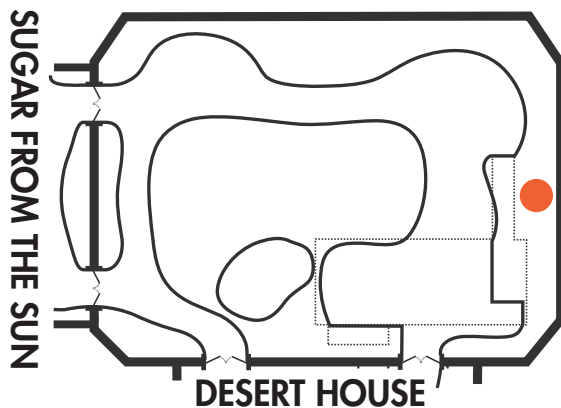
# PINK POWDER PUFF

**Where it grows:**

East Asia



## CHILDREN'S GARDEN



On your way up the stairs to the slide, make sure to stop and look at the pink powder puff! If you can reach, gently touch its puffy flowers with the palm of your hand. What does it feel like?

# PINK POWDER PUFF

## Plant Part: **Flower**



**I wonder...**

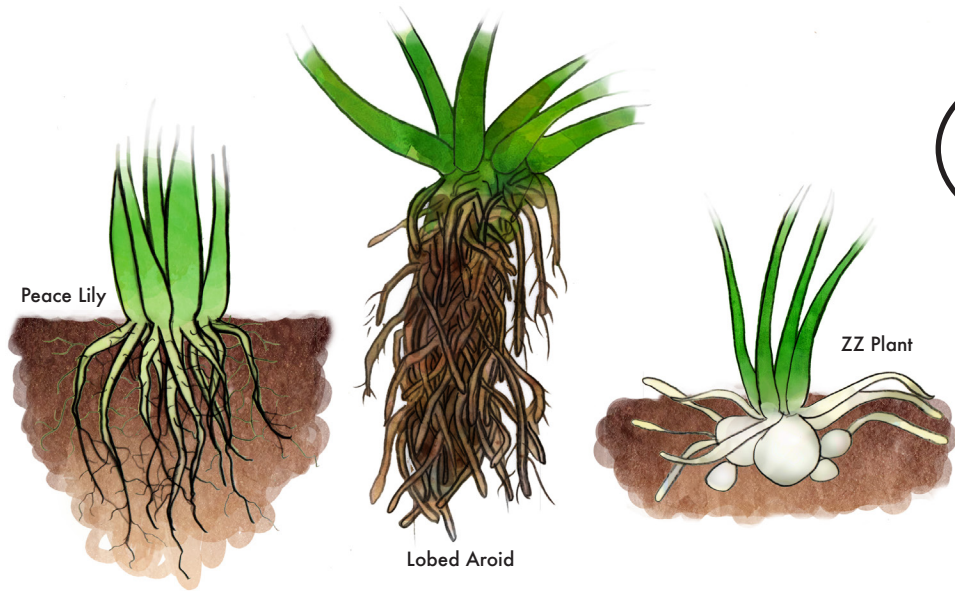
**Do you think something bigger like a bird or something smaller like a fly drinks the nectar from the pink powder puff?**

Hummingbirds drink the nectar from the pink powder puff! When hummingbirds travel to different pink powder puff flowers for nectar, they pollinate the plant.

**Why do you think the pink powder puff flowers are so bright and pink?**

Bright flower colors attract pollinators, just like their sweet smells! The pink powder puff's bright pink color attracts the hummingbirds that drink powder puff nectar and pollinate powder puff flowers.

# LET'S GET TO THE ROOT OF THE ROOTS IN THE AROID HOUSE!



There's more to a plant than what you can see above the ground.



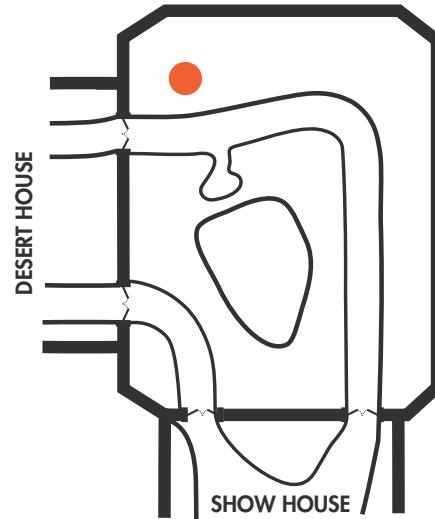
# SENSATION PEACE LILY

**Where it grows:**

Tropics



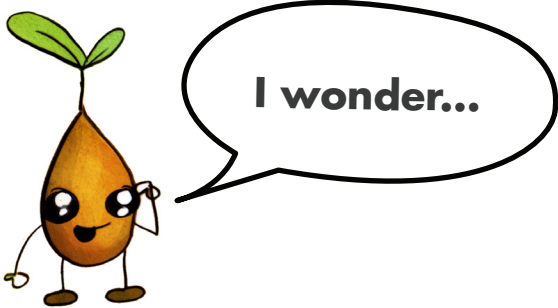
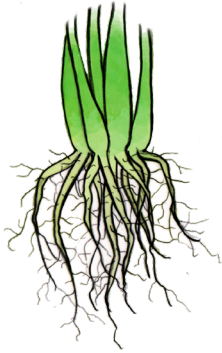
## AROID HOUSE



Can you find the roots of the sensation peace lily? Look closely where the plant meets the soil!

# SENSATION PEACE LILY

## Plant Part: **Roots**



### Where do we usually find the roots of the plant?

The roots of a plant are usually found in the soil because they hold the plant in place – without roots, the plant would fall over! In the sensation peace lily, you can see the very top of the roots where they meet the stem of the plant, but the rest of the roots are underground!

### Do you know why plants have roots?

In addition to helping plants stand upright, roots also drink in water and nutrients that the plant needs to stay healthy and strong. That is why when you water plants, you pour water on the soil!



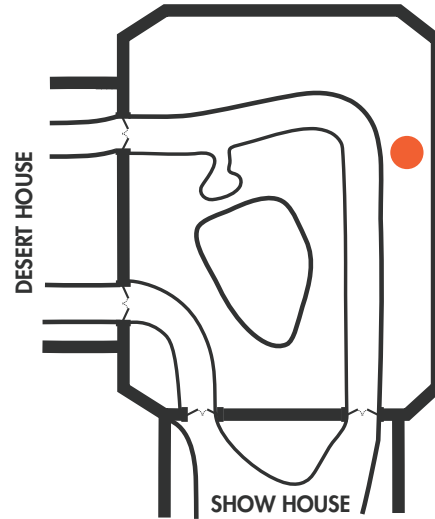
# LOBED AROID

## Where it grows:

Panama, Columbia



## AROID HOUSE



What is covering the trunk of the lobed aroid? It looks like spaghetti! With one finger, reach out and touch it!

# LOBED AROID

## Plant Part: **Roots**



**I wonder...**

### What do you think the “spaghetti” is?

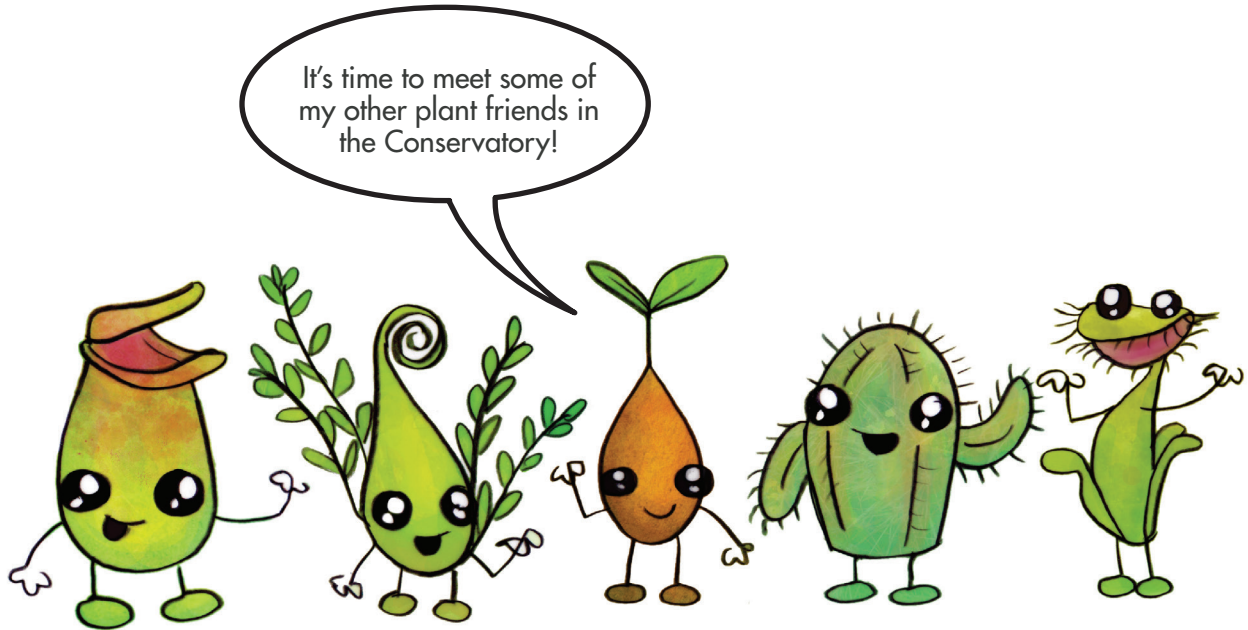
The “spaghetti” is actually the roots of the lobed aroid!

### What does it look like the roots are doing?

Most of the time, the roots of a plant are underground, but some plants grow their roots above ground. The lobed aroid has roots in the ground, but the soil is so wet and loose that underground roots alone do not hold the lobed aroid in place...the spaghetti-like parts around the trunk are roots, too! Once they climb the trunk of the lobed aroid, they reach out to other plants and structures to help keep the aroid in place. Instead of absorbing water and nutrients from the ground, the roots absorb water and nutrients from the air!

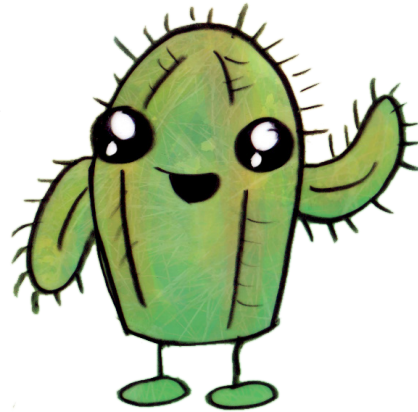
# LET'S GET WACKY!

Now that we have learned about what plant parts are usually like, let's explore some plants that are a little bit different! In this next part of your experience, get ready to discover plants with extraordinary stems, no seeds, and unusual eating habits!



# SNAZZY STEMS & LOOPY LEAVES IN THE DESERT HOUSE

Hi! I'm Spike the Cactus and I live in the desert. Deserts are hot, dry places where water is scarce. It is so hot and dry where I live that plant parts are a bit different to make sure we plants can get enough water! Learn how we survive in this difficult climate in the next pages.

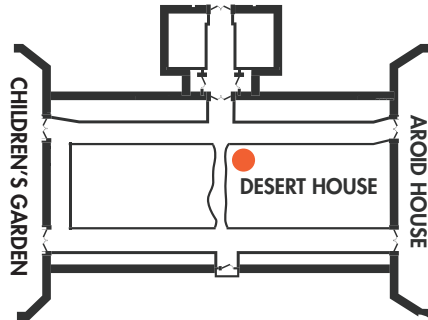


Where is the stem of the totem pole cactus? How do you think the stem helps the cactus survive in the desert? How is it different from the papyrus stem you saw earlier?



# TOTEM POLE CACTUS

**Where it grows:**  
Mexico

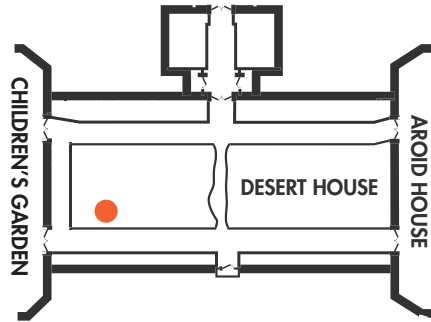


In the case of the totem pole cactus, everything that you see is the stem! Stems of plants like the totem pole cactus are very thick so that they can store lots of water!

Can you find the leaves on this cactus? How are these “leaves” different from the palm fronds you saw in the Palm House? How do you think they help cacti survive in the desert?

# CHIN CACTUS

**Where it grows:**  
Argentina



Cacti have spines instead of leaves to defend themselves from thirsty desert animals who want to drink the water inside cacti stems.

# STRANGE "SEEDS" IN THE FERN ROOM

My name is Curlie and I'm a fern! When you walk into the Fern Room, you can imagine yourself walking with dinosaurs.

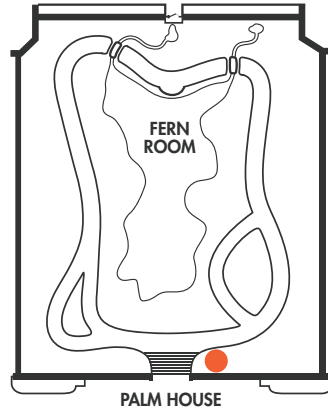


My relatives and I have been around for hundreds of millions of years, which is a long time. We are a little bit different because we're so old. Ferns like me don't grow from seeds...we grow from spores! Turn the page to find out more about spores and how they help new ferns grow.

Why do you think this fern is called the “bird’s nest fern”? Can you find the spores on this fern? What do you think spores look like?

# BIRD’S NEST FERN

**Where it grows:**  
Australia, Fiji, Tahiti



Look underneath the leaf of the bird’s nest fern! Do you see the brown specks that form a pretty pattern? Those are spores! When the spores fall from the leaves into moist soil, they will eventually grow into new ferns.



Can you find the spores on this plant? How are they different from the spores on the bird's nest fern? Do the plants you saw in other parts of the Conservatory have spores?



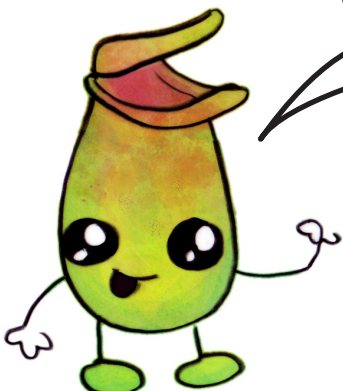
# SAMOAN TECTARIA

**Where it grows:**  
Polynesia



The spores on the Samoan tectaria look like polka dots, while on the bird's nest fern, the spore pattern was striped! See how many different spore patterns you can find in the Fern Room!

# COOL CARNIVORES IN SUGAR FROM THE SUN AND THE SENSORY GARDEN



We are Ed and Pat! We are carnivores.

Great question, Pat!  
A carnivore is a living thing that eats animals or insects to get its food. Most plants are NOT carnivores.

Carnivorous plants like us are pretty special, Pat!

What is a carnivore, Ed?

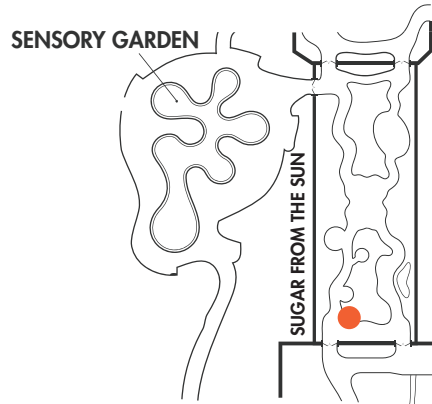
I thought plants make their own food from sunlight. Does being a carnivore make us special?



Why is it strange for a plant to eat insects? How do you think this plant eats insects? What do you think is inside the “pitcher”?

# PITCHER PLANT

**Where it grows:**  
Philippines

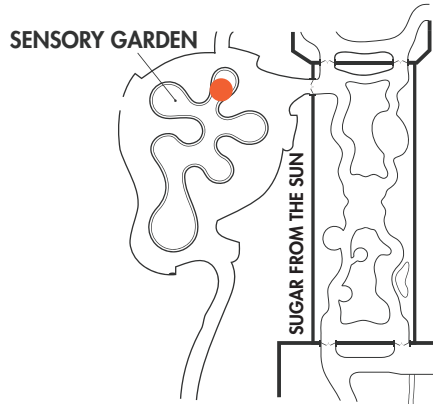


Inside the pitcher plant's “pitcher” is a pool of liquid. Do not try to drink it – there are digestive chemicals in the liquid that eat insects alive!

How do you think the Venus flytrap eats insects?  
How do you think it is different from how the pitcher plant eats insects?  
What do you think is in the “mouth” of the Venus flytrap?

# VENUS FLYTRAP

**Where it grows:**  
North America



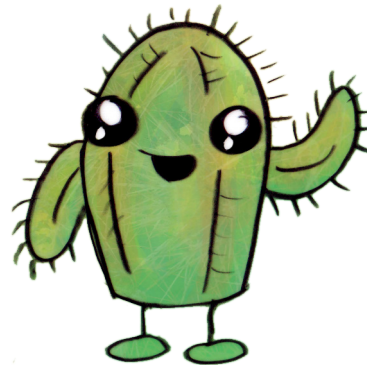
When an unsuspecting insect lands on the Venus flytrap, it touches tiny hairs on the inside of the leaves, which triggers the Venus flytrap to snap shut, trapping the insect! The flytrap then releases chemicals that digest its prey!

# REFLECTION QUESTIONS

What was your favorite plant that you learned about today? Why was it your favorite?



Did any of the plants you saw today remind you of plants that you see in your neighborhood?



After visiting the Conservatory today, what questions do you have about plants? What more do you want to know?



# WHAT IS A PLANT VOCABULARY

**Carnivore** – A living thing that eats only meat (animals, insects) as sustenance.

**Chlorophyll** – Pigment in plant cells that absorbs energy from the sunlight in the process of photosynthesis; the chemical that makes plants green.

**Flower** – A part of basic plant anatomy, which contains the reproductive structures of a plant, as well as brightly colored petals to attract pollinators.

**Fruit** – Grows after a flower has been pollinated; often sweet and pulpy to protect developing seeds.

**Flesh** – The thick, usually soft part of the fruit that protects the seeds. Peaches, apples, and pears are all examples; the part of these fruits that we eat is the flesh.

**FronD** – The term used to describe the leaves of palm trees and ferns!

**Leaf** – A part of basic plant anatomy, which allows for transpiration of water, release of carbon, and absorption of energy from the sun. The biological structure of leaves allows for photosynthesis.

# WHAT IS A PLANT VOCABULARY CONT'D

**Nectar** – A sugary liquid made by flowers to attract pollinators.

**Photosynthesis** – The process by which a plant uses carbon dioxide, water, and energy from the sun to make food (sugar) and oxygen.

**Plant** – A plant is a living organism that is often made up of more than one complex cell and makes its own food using energy from the sun.

**Pollen** – Smaller than sand, pollen grains contain male reproductive cells that fertilize eggs; once fertilization happens, seeds form!

**Pollination** – The transfer of pollen from one flower to another such that the male reproductive cells in the pollen from the first flower fertilize the eggs of the second flower.

**Pollinator** – An organism that facilitates pollination. When animals and insects visit flowers for a drink of nectar, they get pollen on their bodies without realizing. When they visit other flowers the pollen from the first flower brushes up against those other flowers, which pollinates them. Examples of pollinators are birds, bees, bats, and other animals.

# WHAT IS A PLANT VOCABULARY CONT'D

**Root** – A part of basic plant anatomy, which is responsible for pulling nutrients, air, and water from the soil, and also for keeping the plant in place. Usually grows under the soil.

**Seed** – A part of basic plant anatomy, which contains a plant embryo (baby plant) and the nutrients needed to produce a new plant.

**Spine** – A modified leaf common to all cacti that provides protection from predators. Spines also assist with temperature and water regulation.

**Spore** – A part of basic fern anatomy, which allows the fern to reproduce. The fern uses spores instead of seeds. Each fern has its own unique spore pattern of dots or lines on the underside of its leaves.

**Stem** – A part of basic plant anatomy, which carries water and nutrients throughout the plant. Stems usually grow above the soil in the opposite direction of roots and are essential in providing physical aboveground support for the plant.

**Trunk** – A woody stem; a stem is considered a trunk when it grows bark.



# THIS CONCLUDES THE INTRO TO PLANTS EXPERIENCE

Thank you for visiting the  
Garfield Park Conservatory –  
Come again soon!

