

Garden Court

 **The tree that launched a thousand ships**

This fruit of this tree may be eaten ripe (black) or unripe (green) and squished to make oil. It was among the first trees to be grown (domesticated) by humans and used for trade around the world.

Find the tree\* and then check which of the following you think are true:

- this tree is mentioned in the Bible
- the oil from this tree is part of the miracle of Hannuka
- this oil is part of a healthy diet
- the “dove of peace” carries a branch of this tree in its beak

*\*Hint:* The tree is found on the way and near the entrance to Rare and Endangered Species.

**BOTANISTS' BIG IDEA**

#7

**People need many parts and kinds of plants** from throughout the world. Plants give humans far more than food and shelter. Plants and their products traded around the world are called economic plants. The study of how people use plants in their environment is called *ethnobotany*.

**My BIG IDEA**

about ethnobotany is...

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 **connect!**

A plant or plant product that you **eat or drink**

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A plant or plant product that you **wear**

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A plant product you use to **write on or write with**

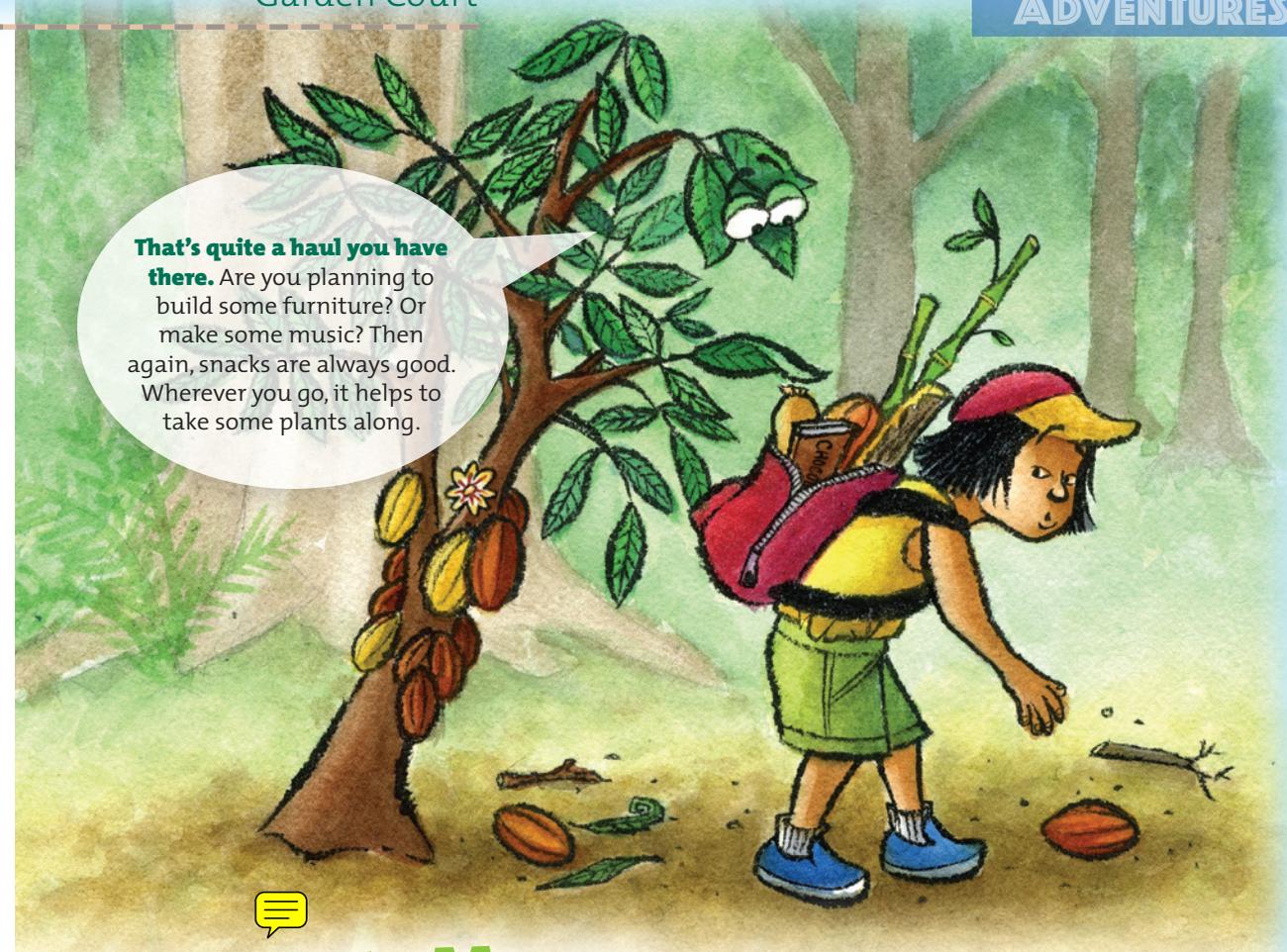
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**FOR ADVISORS ONLY**

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Cover illustration by Jackie Urbanovic



**with My Theobroma Guide**

From your

**TOOLKIT**

- Container #1
- Bag of beans
- Candy coin
- Ruler
- Bamboo flooring sample

**Junior Botanist**

**EXPLORE!**

**Following your nose**

Sniff container #1. Look around the room and find a bunch of this fruit (Hint: look up!). ▶ Does it grow on a tree? Good question! It looks like a tree but does it have wood?

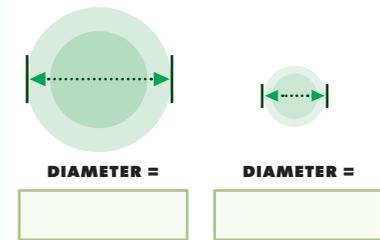
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**Grass is more than a lawn.** Some grasses are incredibly strong. They grow tall enough to be used as poles for furniture, floors, and even houses. Find the large bamboo in the corner by the door to PLANT ADAPTATIONS.

▶ Measure the diameter of the fattest stem of grass you can reach. Then measure the skinniest and record them.



▶ Compare the flooring sample to the bamboo you see. How are they alike?

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**Large grasses' stems are hollow.** Hollow bamboo canes and reeds are used around the world to make musical instruments. They also work for use as water pipes and containers.

**The Superman of Plants.** Some bamboos grow taller than many trees, have stems stronger than wood, and grow faster than a speeding bug (as much as 3 cm or 1" per hour)!



← ACTUAL SIZE



*Botanists' Note*

The study of ways people use plants that grow in their region and of those plants is called "ethnobotany."



**Grass up and go!** Most of us eat lots of grass. No, not the blades, but the seeds that are also called "grains" or "cereal." ▶ What American grain is now being made into a fuel for cars? Hint: Find it in the murals on the north wall.



**Hunting for the pod of gold** Look at the bag of beans. They are from the fruit of a Central American tree and were used as money by the ancient Mayan people. Eat the coin from your kit to discover the name of product made from the beans.

With the beans is a picture of a pod. Find the tree that produces these pods. *Hint:* look by the doors to the Jungle. Look carefully for the tiny flowers and flower buds. ▶ Where do they grow?

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## Keep on Botanizing Here

Botanists call the way that flower stalks attach directly to the main stem or trunk, "cauliflory." You have eaten (or at least seen) cauliflower. ▶ What part of the plant are you eating?

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Find a **redbud tree** where you live or on the internet to see another example of cauliflory.



## Botanists' Note

Botanists call the parts of a flower that develop to cover seeds a "fruit" whether it is juicy and sweet, hard like nuts, or bitter like apricot stones.

### Keep on Botanizing Here

#### International cooperation is helping

More than 100 countries from around the world have agreed to work against illegal selling of endangered plants. The agreement is called CITES. The hope is to stop people from collecting rare plants in the wild. The USBG and other botanic gardens around the world care for plants that are seized by inspectors.

#### You can help too!

Volunteer eco-rangers learn about endangered and threatened plants and then act in their communities to:

- VOLUNTEER to help remove invasive plants
- WORK with builders to save plants before land is cleared for construction
- HELP to spread the word about the threats to plants and why plants are important to our future.



#33604

People can choose to save or hurt plants. Botanical gardens protect plants. You can too.

### My BIG IDEA

about endangered or rare plants is...

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### connect!

**Feet and tires can be deadly!** When you walk in a national park or natural area it is important to stay on the trail. ATVs tear up plant habitat, so don't ride them off-trail.



Cover illustration by Jackie Urbanovic

# Hanging out with Kokia and Rare and Endangered Species

From your

## TOOLKIT

- Hand Lens

**It's about time!** If you don't pay attention there are some species you are going to miss because they are disappearing! And be careful whom you bring home—some of those plants are barbarians—they disrespect us locals! It's upsetting—did you know that 1 out of every 8 plant species in the United States is endangered?

### Junior Botanist EXPLORE!

#### Transplants threaten native plants

When people introduce new species of animals and plants into an area, the native plants often decline or disappear. This is especially true for isolated places such as islands. ▶ Why do you think this might happen?

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Photo: TGV

#### Dandelions—the rest of the story.

Dandelions are not native plants! They are tremendously successful invaders.

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**Find the Wollemi Pine** and read its story.

▶ Where does it grow?

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▶ It is an ancient conifer. When was it first found by humans?

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▶ How many are left in the wild?

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▶ How do you think they could be threatened by an introduced species?

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▶ Do you think the Wollemi Pines are worth protecting? Why or why not?

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**Beauty contests.** Some plants are appealing. Some aren't. How would you answer these questions?

▶ Do you think that a plant's appearance matters when people are making the decision to protect it?

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▶ Should this even be considered? Talk it over with your advisor.

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▶ Do you think a plant's appearance makes it more or less likely to be threatened? Why?

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**Look carefully at the orchids in the room.** Some of them look odd! Orchid collectors pay money for unusual forms and orchid hunters collect them from the wild. See if you can find:

- Ruffles
- Freckles
- Spurs
- Buckets

### Botanists' Note

Plants that live in rare habitats can be wiped out in a single disaster. These plants can be protected by protecting their habitats.



Look at the spines on **brain cactus** with your hand lens. ▶ Why do you think someone would steal this plant from the wild?

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## WEIRD but Wonderful PLANT TALES

**Cliff dweller lost its pollinator.** A rare plant in Hawaii has the odd name "cabbage on a stick" and lives only on cliff faces hundreds of feet in the air. Its pollinators are gone. Botanists hang by ropes and use paintbrushes to pollinate them so that the plants will continue to make seed.

**When plants disappear, animals may too.** Hawaiian honeycreepers depend directly on Kokia's nectar for food. When plants become rare or extinct, often their pollinators do also, and vice versa. We are all interdependent!

**How do plants become endangered?** Read two of the plant story signs. ▶ Write the name of the plant in the story and the reason it is now endangered:

**PLANT**  
.....

**REASON**  
.....

**PLANT**  
.....

**REASON**  
.....

**Go hunting**  
Look around at the plants in this room. All are endangered!  
▶ Choose a plant that you think people will want to help save. Why did you choose it?

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### Mapping the Stars

► Look at the stars on your map. How many continents have stars?

► Which one has the most stars?

► Draw a star on the place where you would most like to go.

## BOTANISTS' BIG IDEA

#452

**The gold rush is over** but the hunt for treasure is not. In remote places, botanists continue to find plants that scientists do not know. Bioprospectors and plant designers are finding new ways to use plants to solve health and other world problems.

### My BIG IDEA

about plant exploring is...

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### connect!

**Every time you eat corn on the cob,** you are eating a hybrid that was developed by plant breeders who “explored” for improved traits. In fact, *all* corn was developed by humans—corn as we know it does not exist in nature.



Photo: ashrei

**FOR ADVISORS ONLY**

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Cover illustration by Jackie Urbanovic

**Plants do get around!** Humans have had a hand in that. After a while, it becomes hard to know where we originally grew! I know that I came here from Mexico. Plant explorers spread beautiful and useful plants around the globe.

# Roaming the Globe as a Plant Explorer with Marigold

Junior Botanist

EXPLORE!

From your

### TOOLKIT

- World Map
- Pressed Leaf

**Tracking the Explorers.** Imagine yourself on a trek in the paths of the plant explorers. Use the world map and the signs to find out where they wandered. Draw stars on your map to show where they visited. Ready? Let's get started!



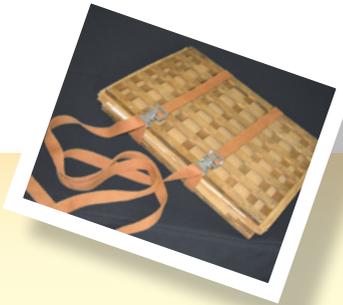


**Go to the U.S. EXPLORER EXPEDITIONS exhibit sign.** Record stars on the contents visited by the expeditions.

Look at a leaf on the plant called *Calathea* near the sign. ▶ Make notes here about the plant's size, shape, and color of the leaves. Compare the living leaf to the pressed leaf in your kit.



Four horizontal dotted lines for taking notes.



### Botanists' Note

Botanists put leaves, seeds and other parts of plants they want to study and keep between sheets of paper when they are in the field. They stack the papers in plant presses to preserve and carry them easily. Sometimes they bring back living plants, too. *Herbariums* are organized collections of sheets of these pressed parts with notes about the plant.

**Go to THE QUEST CONTINUES exhibit sign.** ▶ Where are the two explorers standing? Put a star on your map.

One horizontal dotted line for taking notes.

**Designer plants.** Some plants' genes have been changed to cure and prevent diseases. ▶ What food plants have been designed to produce medicine for humans?

Four horizontal dotted lines for taking notes.

**Like many botanical gardens,** this one grew from the collections of an explorer. ▶ Which expeditions brought their plants here?

Four horizontal dotted lines for taking notes.

**An insect repellent in your toothbrush.** Asians have used the neem tree to brush their teeth and repel bugs for centuries. ▶ Would this plant catch your attention if it was not shown on the sign? Turn away from it and try to describe it.

Four horizontal dotted lines for taking notes.

### Botanist's Note

Botanists call plants that have been imported "exotics." Your guide is a beautiful exotic. Find one exotic plant in this room that is *not* beautiful.

**Go to the exhibit** in the center of the room. ▶ What is the exhibit about? Do you think it is about plant exploration?

Four horizontal dotted lines for taking notes.

**Biotechnology and you.** Talk with your advisor about the idea of giving plants traits they did not have naturally to solve world problems. ▶ Is it a good idea? Do the two of you agree or disagree?

Four horizontal dotted lines for taking notes.



### Keep on Botanizing Here

**Go to the WELL-TRAVELED PLANTS exhibit.** ▶ Which food plants mentioned here originally grew in the Americas?

Four horizontal dotted lines for taking notes.

**Plants get around too.** Put a star on the continent that has the most plant "journeys." ▶ Which plant traveled the farthest?

Four horizontal dotted lines for taking notes.

**Two-way trade.** Explorers and new settlers also brought plants to the Americas. African slaves were brought to the Caribbean islands to work on plantations to grow a grass. ▶ Which grass was this?

Four horizontal dotted lines for taking notes.

**Favorites travel further.** ▶ Which of the plants you have learned about in this room would you have been willing to carry on a trip that lasted a year and took you half way around the world?

Four horizontal dotted lines for taking notes.



**Burger, shake, and fries.** ▶ What ingredient in this favorite American meal changed the history of Ireland?

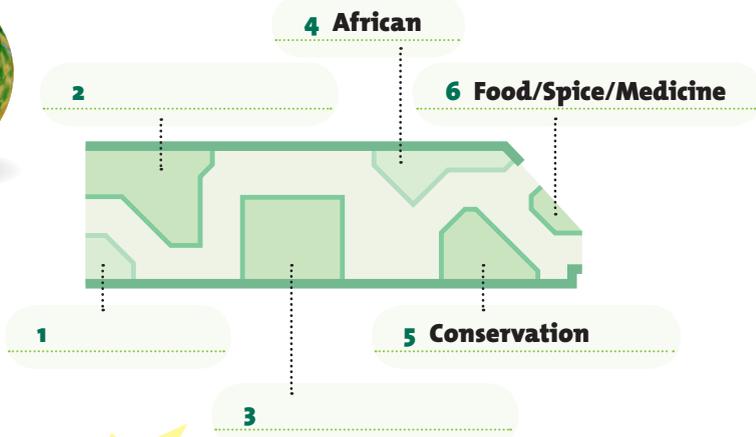
Four horizontal dotted lines for taking notes.

Medicinal Plants

**Medicinal Plants from Around the World**



Medicinal plants are found everywhere, and some are used for both food and medicine. In this room diagram, each bed is shown. Three are labeled. The other three beds each contain plants from different parts of the world. ▶ Read a few labels in each bed and see if you can figure out the region that is represented.



Plants help us keep physically and emotionally healthy. Researchers have found that being in a garden reduces stress.

**connect!**

Tea, coffee, and colas contain caffeine, a potent substance that is also used as a medicine. Tea and coffee are found in the end bed with medicinal and dietary plants. The Kola tree from which cola drinks are made is in the Garden Court. ▶ Can you think of a beverage (besides water) that isn't derived from a plant flavor?

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**My BIG IDEA**

about medicinal plants is...

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**FOR ADVISORS ONLY** Advisor initials on completion \_\_\_\_\_ Date completed \_\_\_\_\_

**Who said that "a spoonful of sugar helps the medicine go down"?** This is the place where you'll find both the medicine and the flavors to cover it up. I've always wondered how people found out which ones helped them get well.

From your

**TOOLKIT**

- Container #2
- Container #3



**Apprenticing with Stevia the Guide**

Junior Botanist **EXPLORE!**

**Cookies and cold medicine**  
Sniff container #2. Find this big bush near the door to the Orchid House. Lean over and sniff a small branch and a leaf. What plant part does this spice come from? (Hint: Peek in the container.)

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**The large tree to the right** of the spicy bush you just found is a close relative. It is used for colds and deep muscle rubs. In fact it's such a close relative it has the same first (genus) name! What is its name?



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Cover illustration by Jackie Urbanovic



### STEM CROSS-SECTIONS

 Circular Stem



 Square Stem



**Boxy stems and good smells.** Plant stems can have different shapes in cross section that can be helpful in identification. Check out one of the large woody plants in this room and feel its stem. ▶ Which of these diagrams describes its stem shape? Write the plant name.

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▶ Now check smaller plants that are in pots. Look until you find one with a square stem and write its name.

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Many members of the mint family have square stems. Show your companion three more plants from this family. Feel the stems to see if this is true.

### Sweet triplets

Smell container #3. Its contents, star anise (brown in color with black seeds), aniseed (off-white, smaller) and fennel seed (off white and larger) all share the same licorice flavor. Locate the star anise plant in the room. ▶ What plant family does it belong to?

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▶ Is it a tree, bush (botanists use the term *shrub*), or herb?

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The aniseed and fennel seed come from herbs in an entirely different family, *Apiaceae*. All three have the chemical *anethole* that produces the same licorice flavor and is 13 times as sweet as sugar. Anethole is chemically active

and probably helps the plants ward off disease. Star anise also produces shikimic acid, a primary ingredient used to create the anti-flu drug Tamiflu.



Photo: Emiz

### Botanists' Note

Many plants that have strongly scented parts have chemicals that have been used to improve people's health.

In addition to its use in incense and perfumes, **patchouli** (right) also gives a distinctive smell to things like paper towels and laundry detergents.



## WEIRD but Wonderful PLANT TALES

### More sweet truths

Your guide Stevia is actually pretty sweet, too! When dried and powdered, the leaves of this plant are 13 times as sweet as sugar. You will find Stevia in a pot.



Photo: maryspics

### More licorice

The popular rubbery candy we call licorice is made from the root of *Glycyrrhiza glabra*, from which a sweet flavor, 50 times sweeter than sugar can be extracted. The licorice plant is a legume (related to beans and peas) and native to southern Europe and parts of Asia.



Photo: nizaroz

## Keep on Botanizing Here

### Root beer all around?

Opposite the bench along the path is the root beer plant. Gently rub a leaf and then smell your fingers. ▶ How would you describe the shape of its leaf?

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This room is a good place to look for plants with different kinds of leaves. One botany book lists 19 different shapes and more than 27 different terms to describe variation in leaf margins, tips and bases.

## Keep on Botanizing Here

► Spray the tip of an agave leaf. Spray a hairy plant. Where does the water go?

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► How could this help a desert plant?

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► Count off 10 plants on your side of the path. How many are cacti? (read labels).

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► How many of your 10 plants are succulents?

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► Are all the succulents cacti?

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\_\_\_\_\_

**FOR ADVISORS ONLY**

**Walk along the path.** Compare the size of the leaves of the next 10 plants to your hand. Tally how many plants of the 10 have:

Leaf size	Number of Leaves
Smaller than nail of little finger	
Bigger than your hand	
In-between	



#1273

**Plants that live in the world's deserts look alike.** Spines, slanted leaves, succulence, and life as annuals help some plants collect, store, and avoid losing water.

## My BIG IDEA

about desert plants is...

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## connect!

**Like these plants,** people and animals who live in deserts all over the world have evolved similar ways to cope with heat and drought.

Advisor initials on completion \_\_\_\_\_ Date completed \_\_\_\_\_

# Wandering the World's Deserts with My Agave Guide

**It's an unpredictable place, the desert.** Hot days, cold nights, rainy sometimes—and then we have no rain for a *long, long time*. The plants here can't put on hats or carry water or hide out, like you do—can they?

Junior Botanist

From 

**TOOLKIT**

- Penlight
- Spray bottle

## EXPLORE!

**Where's the water?** Some plants can store water—when they get it—in thick fleshy leaves or stems. We call the parts that hold it “succulent.” Look along the path and find:

**A plant** with succulent leaves from North America. Hint: Search near the “Alike Outside and In” sign.

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**A plant** from Africa with succulent leaves.

\_\_\_\_\_

\_\_\_\_\_



**A plant** from Africa that stores water underground, like a foot. (Hint: Its name starts with “pachy”)

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\_\_\_\_\_

**A plant** with a succulent trunk.

\_\_\_\_\_

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Cover illustration by Jackie Urbanovic



**Hatless in the desert.**

Carefully run your finger down the *Kalanchoë orygalis*. ▶ Look at it with your hand lens. What does it remind you of?

▶ Could hair help a plant? What does your hair do for you? *Hint*: Where do you get sunburned on your head?



Shine your light on a hairy cactus. Move the light and watch the shadows. ▶ What do the hairs do?

Now shine your light on a spiny cactus without hairs and move it around. ▶ Where are the shadows?

Plants don't have hats, but spines and hair can shade and protect the tender part of the plant from the burning sun.



**Ouch! Would you eat those spines?**

Neither would most animals. Javelinas and wood rats have mucus that prevents the spines from hurting their mouths.

▶ Choose a cactus and look carefully—how many spines grow from one central point?



**Playing hide and seek.**

Look for small flowering plants that are not succulent—like you put in a pot for the summer. Plants like these escape the hot dry times by hiding as seeds (annuals) or hiding as roots in the soils (dormant perennials).

*Botanists' Note*

Originally, cactus **ONLY** lived in the Americas. Even in North America they are not the only plants in the desert.



**Are all those spines useful?**

Spray a little water from your Discover Pack spray bottle on the spines of a cactus\* shaped like a fence pole and one that looks like flat plates stuck together. ▶ Where does the water go?

▶ How could this help a spiny plant in a dry time?

\*Check to see that the label does say "Cactus Family/ Cactaceae." There are look-alikes throughout the world.



Photo: Olaf

**WEIRD but Wonderful PLANT TALES**

**Some real plants are named after imaginary ones!** Find the "Boojum tree" here. Botanist Gregory Sykes named it for the Boojum in Lewis Carroll's poem "The Hunting of the Snark."

**Find Welwitschia.** ▶ What is unusual about this plant? Describe it to your advisor.

**Jojoba is another odd plant.** Its leaves stand up straight in the sun which avoids midday "sunburn". Its oils are used in cosmetics. ▶ Did you see it here?



Garden Primeval

**Unferished Business**

Some of the ferns in here look like trees, and some look like ferns we see in forests.

► Find a tree fern. Where is it from?

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Living tree ferns are found in the southern hemisphere.

► Look up! What do you see on the underside of its fronds?

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#2069

**Botanists put plants with similar ways of reproducing** into groups. Those with similar leaves or shapes may not be closely related.

**My BIG IDEA**

about about Primeval plants is...

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*Botanists' Note*

Botanists who study plants of the past are called "paleobotanists."

**connect!**



**Young emerging tips of ferns** unfurl in structures called "fiddle heads." Try to find one in here. Plant forms have often inspired artists. There is a violin in the West Gallery—stop by and look at its "fiddle head."

**FOR ADVISORS ONLY**

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**Some folks find this place downright confusing.** It's a garden—but there aren't any flowers here. And some of these plants have downright primitive plumbing. And it seems like some of us have been here *forever*—well, almost that long. The fossil you have tells that story.

**Surveying the Garden Primeval with Cycad Guide**

From your

**TOOLKIT**

- Hand lens
- Box with piece of coal and fossil

Junior Botanist

**EXPLORE!**

**A rocky past**  
Examine your fossil with the hand lens. Match it to a living plant or group of plants in this room. What kind of plant looks most like your fossil?



Cover illustration by Jackie Urbanovic



**Don't be fooled—look for yourself**

A sago palm like your guide is actually a *cycad*, not a palm. Find the sago palm growing behind the pool. ▶ How is the sago palm like a true palm tree?

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**Skinny mini plants**

Look for the whisk fern on the rock by the end of the pool. ▶ Do you see any leaves?

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▶ How do you think it makes food for itself?

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▶ How is it different from a true fern?

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Use your hand lens to look at some of the rocks here to spot tiny plants. Even the most ancient plants, like these, were green!



*Botanists' Note*

Not all plants have flowers, or even seeds, real roots, or leaves!  
The most ancient plant groups lacked many of these.



**Keep on Botanizing Here**

Find another group of plants here that does not have leaves. (*Hint:* They might remind you of asparagus.) Look in the center of the room. Touch the stem of one of these “scouring rushes” without rubbing it. ▶ Look at it with your hand lens and describe what you see.

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*Botanists' Note*

Cycads are more closely related to conifers than to palm trees.



**Magic dots**

Ferns don't have flowers, so they don't have seeds. But they do have spores which grow into new plants. Turn over some fern fronds (leaves). Find the yellow or brown sori shaped like buttons. A spore is really tiny. A single leaf with sori could contain hundreds of thousands of spores!

Sori are easy to see on the Florida strap fern. Look at them with your hand lens. ▶ What do they feel like?

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**WEIRD but Wonderful PLANT TALES**

**Paleobotanists assign botanical names to the fossils they find.**

Whole plants are rarely preserved as fossils. When a whole fossil is found, the top and bottom may have different names!



**The spores in a fern can live a long time.** People buy new seeds every year to grow plants in their garden. But some water clover spores germinated after 32 years.

## Sizing them up

Check out the size of leaves on the next 10 plants along the walkway. Tally how many plants of the 10 have leaves of each size.

▶ Leaf size is **smaller** than the nail of your little finger

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▶ Leaf size is **bigger** than your hand

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▶ Leaf size is **in-between**

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**ABC Plants.** Many plants in the jungle form leaves with slits and holes. Remember Swiss? Others have colored lines that look like slits. Some scientists think the leaves fool insects into thinking they have “Already Been Chewed”! Find an “ABC” plant.



**Plants and animals interact in many ways.** This is especially apparent in a jungle.

#6579

## My BIG IDEA

about plants and animals living with them is...

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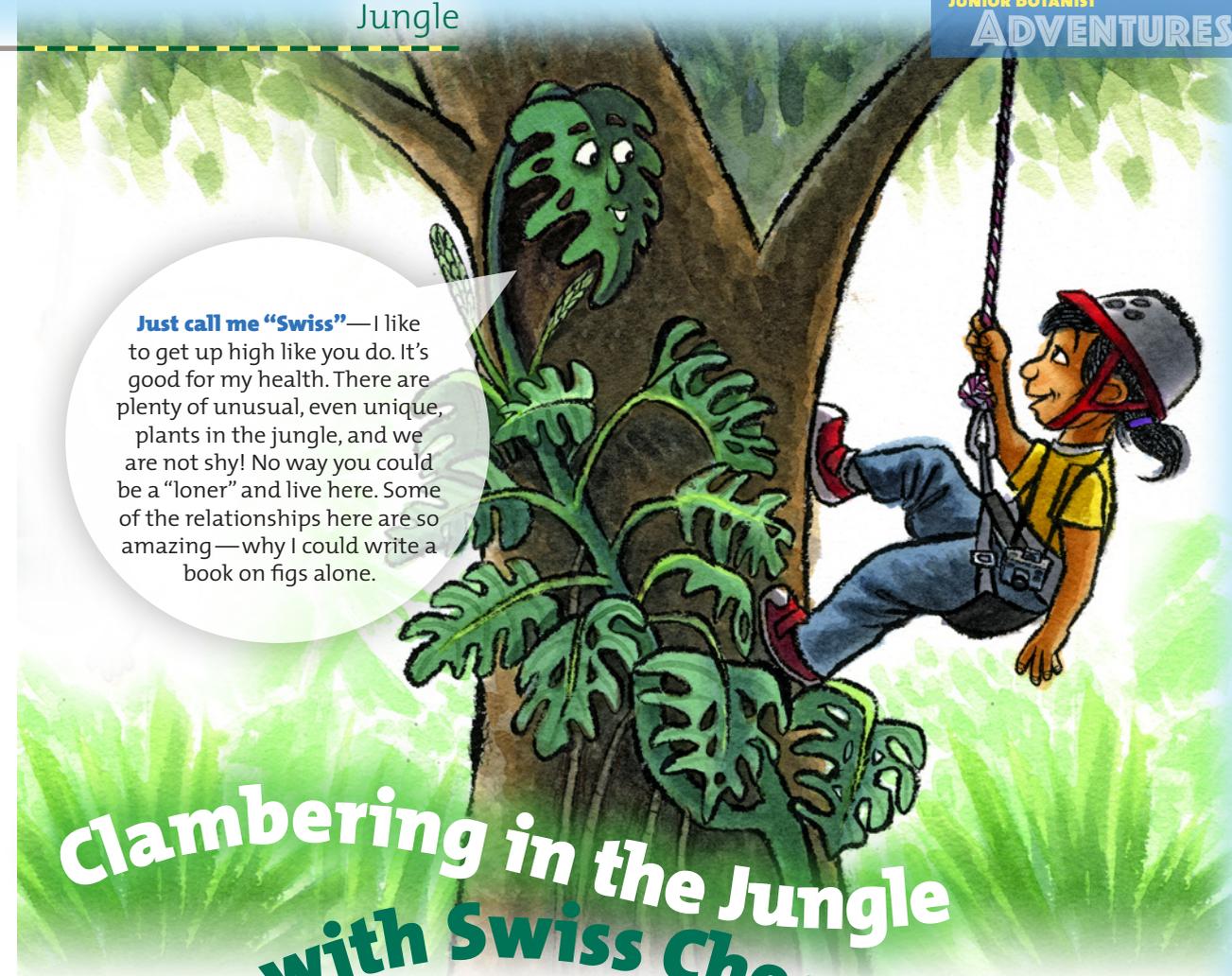


**Many birds that we see** in the United States and Europe migrate each winter to rainforests in the tropics.

**FOR ADVISORS ONLY**

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Cover illustration by Jackie Urbanovic



# Clambering in the Jungle with Swiss Cheese Guide

From your

## TOOLKIT

- Hand lens
- Ruler

Junior Botanist

## EXPLORE!

### Hitching a ride to the heights

Some plants don't grow tall or even climb to the sun. They hitch a ride as a seed, in a bird's mouth. The brighter light high in the trees gives seeds dropped there a boost. Go up the canopy walk.

▶ Which of the *epiphytes* (plants living on plants) along the canopy walk do you like the best?

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**Faking them out.** Butterflies pollinate passiflora plant flowers. However, the same butterflies lay eggs that hatch into leaf-eating caterpillars on the plants' leaves. Find a passiflora plant. ▶ Sketch three leaves.

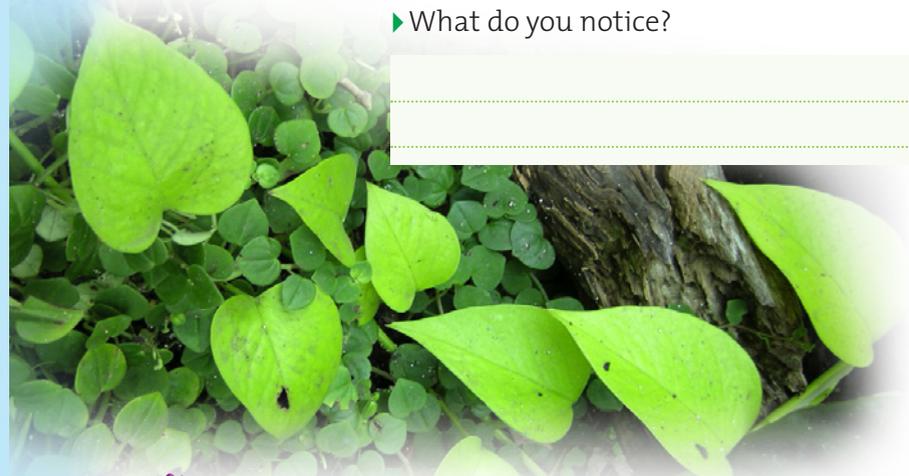
<i>Leaf #1</i>	<i>Leaf #2</i>	<i>Leaf #3</i>

▶ What do you notice?

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**Creepy climbers.** Many plants bend toward light. Some jungle plants grow toward darkness and then climb up the next upright object they bump. Take a good look at your guide, the Swiss cheese plant. ▶ How might creeping and climbing help it survive?

These plants also have parts that look like yellow butterfly eggs. Observe some with your hand lens. Count how many fit into one inch. ▶ How big is one "egg mimic"? (in inches)

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▶ Draw where the egg mimic is on this plant.

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### Botanists' Note

Defenses like egg mimicry help plants survive. Even ways plants interact with one another can help them survive. Look at Swiss!

### The plant menagerie.

Take a walk. Look for an animal name on a plant label. ▶ Why do you think the plant has this name?

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Keep an eye out—you might find some other plants named this way!



### Keep on Botanizing Here

**Flowers that heat up when they are ready to be pollinated.** Look along the pathways until you find a flower like the one shown at left. Look at it with your hand lens. It is actually hundreds of tiny flowers joined together! Beetles pollinate these flowers. More beetles visit these flowers when they are hot and smelly than at other times. Do beetles respond to the heat or scent? No one is sure.

Measure the part of the structure that sticks straight up. ▶ How tall is it?

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A plant related to this one bloomed here and it was more than five feet tall!

▶ These strange flowers are typical of members of what family?

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## WEIRD but Wonderful PLANT TALES

**Strangler figs grow down and then up.** Despite their name, stranglers are not parasites—they make their own food. When a fig seed is dropped high in a large tree, it starts growing—down. When the shoot reaches the ground, it roots. Then it grows up, gradually surrounds the tree where it landed, and kills it. You can see the roots growing down from the strangler fig.

## Apples, More and Less

### Buy unusual fruit

Do you always eat the same kind of apples?

▶ How many kinds did you count at the supermarket?

▶ Count all the "heirloom" apples listed on the internet.

▶ Read about the apples that used to be grown in the U.S. How do your apple choices at the grocery store affect what farmers choose to grow?



#410001

**Even plants we take for granted** have very special ways of living. Looking closely at the plants around us helps us understand the challenges they face and how we depend on plants.

My **BIG IDEA** is...

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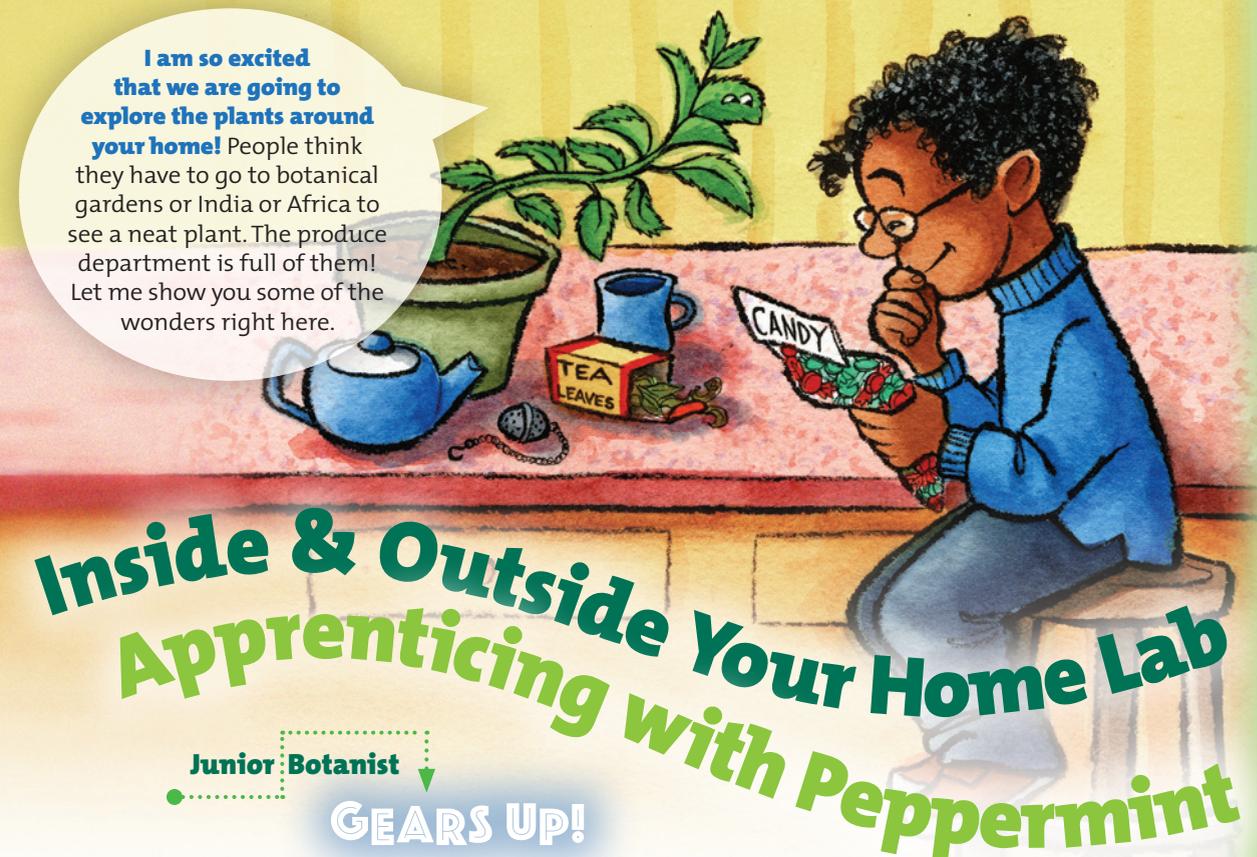
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### connect!

**Botanists and other plant scientists** get to make discoveries out in the world and in the laboratory. They work to produce new and better foods, protect our environment, discover new medicines, and assure that plant knowledge is passed between generations.

**FOR ADVISORS ONLY**

Advisor initials on completion \_\_\_\_\_ Date completed \_\_\_\_\_



**Start by taking a field trip!**  
Take a companion to your supermarket. Look for the items on this list. Fill in the "part used" with one or more of the following choices: **root, stem, leaf, flower, fruit, seed,** or **don't know.** Highlight the ones you have eaten. If you don't find everything, try looking at a farmer's market.



Photo: Niculina

ITEM	SECTION OF STORE	PLANT PART USED
<input type="checkbox"/> Fennel	Produce	
<input type="checkbox"/> Broccoli	Produce	
<input type="checkbox"/> Beet	Produce	
<input type="checkbox"/> Violets	Produce or Bakery	
<input type="checkbox"/> Kiwi	Produce	
<input type="checkbox"/> Prickly Pear Pad or Nopales	Produce or canned vegetables	
<input type="checkbox"/> Fenugreek	Spice	
<input type="checkbox"/> Anise	Spice	
<input type="checkbox"/> Capers	Condiments	

Cover illustration by Jackie Urbanovic

### In the Produce section

How many kinds of apples do you see?

▶ How many have you ever eaten?

▶ If your companion approves, buy two different kinds you have never tasted. Do they taste different? Write their names here:

APPLE #1

APPLE #2

For any items on your list that you filled in “don’t know” look in a book or on the internet to find out.



Photo: ngelder



## Keep on Botanizing in your Neighborhood

### Weed check

Get an early start—before 10 a.m. Hunt for a dandelion with a flower bud that has not opened. Where is the bud?

▶ Ask permission to put a pencil or clothes pin in the ground to mark the location of that bud. Come back in 3 hours, 6 hours, and 9 hours or one day. What is changing?

▶ Ask permission to dig up a dandelion and a little clump of grass. (Dandelions will be hard to dig.) Look closely to compare the roots. How do you think the differences help these plants survive?

### Bottoms up!

Label the top of three different blades of grass with a dot of tape or permanent marker. Put a clothes pin or pencil by the marked grass so you can find it later. Where do you think the dot will be when the grass grows taller? Check in a week or before the grass is mowed. Were you correct?



Photo: Wade Franklin



### What’s growing where?

Think back to your visit to the Conservatory. Where in the Conservatory did you see the most ferns and mosses? Did you see them in other rooms, too? Use your memory and notes as clues to predict where you will see them growing around your home, in parks and yards and along the street. Check your predictions. Did you see what you predicted you would see? Compare mosses that grow in the sun and in the shade. How are they different?

## Junior Botanists Explore!

**Chestnuts roasting on an open fire.** You have heard this phrase in a popular holiday song, but have you seen a chestnut? Research the story of the American chestnut. Why is it no longer in American forests?

**Clothing tag check.** Check your closets for items made of linen, cotton, and ramie. What are the plant sources for these fibers? Do you have any clothes made from other plant fibers?

## Reviewing your Junior Botanists’ Notes

**Sizing up leaves.** Measure leaves on five plants outside your house or school or in a park.

LEAF ON PLANT #1 (WIDTH × HEIGHT)

LEAF ON PLANT #2

LEAF ON PLANT #3

LEAF ON PLANT #4

LEAF ON PLANT #4

▶ Look at the leaf measurements you made in the World Deserts and Jungle. Are the leaves on plants in your home sample more similar in overall size to leaves in the World Deserts or in the Jungle? Where are the leaves the biggest? Where are the leaves the smallest?