Plants: A First Look

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Our appreciation to: Margaret Conover

Long Island Botanical Society

Produced for Rainbow Educational Media by Cochran Communications

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INTRODUCTION

Plants are an essential part of our lives. We depend on plants for the air we breathe, the food we eat, the clothes we wear, the houses we build, and even many of the medicines we take

Plants: A First Look provides young students a simple overview of the world of plants. The video shows a wide variety of plant types in settings as diverse as deserts, tropical rain forests, and students' own back yards. The program shows how plants are similar to other living things and how they are different. It describes different plant parts and how they function.

The program also shows students performing simple experiments with plants that viewers can duplicate, either in school or at home. These experiments both teach students about plants and introduce them to the scientific method.

Grade Level: This video is appropriate for use with grades 1 through 3.

SUMMARY

The video shows two children walking in a park looking at the life around them. At first the kids focus on animals, but then they shift their attention to other forms of life—plants. The video establishes that plants are just as much alive as animals.

The video then introduces Margaret Conover, a botanist, who briefly describes the variety of plants, including mosses, ferns, conifers, and flowering plants. The program shows how plants exist in very different environments.

The video shows how all plants share characteristics with other living things. It first focuses on the needs of the students themselves. In order to survive, the students need water to drink. The video shows that plants, too, need water. The program shows a student engaged in an experiment involving two identical house plants. He waters one but not the other. The video shows the plants a week later and how the unwatered plant has wilted. Margaret Conover explains that without water plants will wilt and die. She then describes how a cactus has special features that allow it to store water in order to survive in desert conditions.

The program next explains that plants get energy from sunlight rather than from eating food. A student describes another experiment. Two identical plants both get the same amount of water, but the student leaves one in the dark while he leaves the other in a window where it gets sunshine. The teacher here has an opportunity to stop the program to allow students to predict what the plants will look like after a week. When the program resumes, the student describes how the plant that didn't get light looks like it's about to die.

The program then describes photosynthesis. Graphics clarify how plants use sunlight, water, and carbon dioxide to manufacture their own food. During photosynthesis they also produce oxygen.

The next segment describes how many plants grow from seeds. It shows how seeds contain food that allows a tiny plant to grow inside the seed and then break out from the seed coating.

The program next focuses on how different parts of plants serve different roles that are essential for a plant's survival. Leaves capture the energy of sunlight. Roots anchor a plant to the soil and take in water and minerals. Stems carry water and minerals from roots to other parts of a plant.

This section concludes with an experiment in which a student puts a white carnation into a glass filled with water that is colored red. The viewers are asked to predict what will happen, and the teacher is given an opportunity to pause the video. After the program resumes, the video shows how the stem of the carnation carried the colored water to the flower, which became red.

The last segment shows how plants are useful in many ways. The video shows a student eating a hamburger and explains that the bun comes from wheat and that the meat comes from cattle that ate grass. The video describes how cotton can be used to make clothing. Margaret Conover describes how many medicines come from plants.

A brief summary concludes the program.

OBJECTIVES

After viewing the program, students will be able to:

- describe different kinds of plants.
- describe how plants live in different environments.
- describe how plants need light and water to survive.
- explain how many plants grow from seeds.
- identify the roles of different parts of a plant, including leaves, stems, roots, and seeds.
- describe how plants are useful to people.

REVIEW QUESTIONS

1. Name different kinds of plants.

Plants in the program include trees, mosses, ferns, cacti, and flowers. Students should be encouraged to think of their own examples.

2. Where are some of the different places where plants live?

The program describes how plants live in deserts, tropical rainforests, and in water. Students should be encouraged to think of their own examples.

3. What are some things plants need to live?

The program emphasizes that plants need water and light. Some students may also recall that plants need carbon dioxide for photosynthesis.

- 4. Where do plants get their energy? *Plants get energy from sunlight.*
- 5. Where does photosynthesis take place? *In leaves*.
- 6. What is an evergreen?

 A plant that keeps its leaves all year round.
- 7. What do roots do?

Roots anchor a plant to the ground and take in water and minerals from the soil.

8. What does a stem do?

Stems carry water and minerals from roots to other parts of a plant.

9. What is a seed?

A seed is the part of a plant that can grow into a new plant.

10. How are plants useful to humans?

The program describes how we need plants for oxygen, food, clothing, paper, medicines, and timber. Students should be encouraged to give other examples.

ACTIVITIES AND DISCUSSION QUESTIONS

Questions Posed in the Video

1. Light and Plants: This experiment is easy to duplicate as shown in the video. Another question students can explore is: Do seeds need light in order to germinate? The following experiment addresses this question.

Put a moist paper towel on a lid or saucer, then sprinkle some radish seeds onto the towel. Cover the seeds with a cup that blocks the light. After a few days have the students check the seeds. The seeds should have begun to grow even though they didn't get any light.

Ask the students why the seeds were able to grow. If they need help, remind them that seeds contain food that enable the tiny plants inside to grow. After the plants use up this food, however, they will need light in order to continue growing.

2. Carnation: This experiment works best if the carnation (or other kind of white flower) is somewhat dry. You can begin to see results in as little as half an hour, but it may take several hours or even a couple of days for the results to be dramatic.

Students can also try a variation of this experiment. Split the stem of the flower in half. Have the students put one part in water dyed red and the other in water dyed blue. After a while, part of the flower will turn red and the other blue.

A third variation of this activity is to put a stalk of celery in water that is dyed. After several hours, cut through the stalk. Students will be able to clearly see tiny circles outlined in color. These show the channels that carry water up the stalk.

Additional Questions and Activities

- 1. Take the class to visit a botanical garden. Indoor gardens in particular will show a great variety of plant species from different kinds of environments.
- 2. Have students explore the plant life around their school or homes. Encourage them to write down as many different examples of plants as possible.
- 3. To see firsthand how plants grow from seeds, soak some beans in water overnight. Then line the inside of a glass jar with construction paper and put wet towels in the middle of the jar. Place the beans between the jar and the construction paper and place the jar where it will get indirect sunlight. Water the paper towels for several days to keep the paper moist. After a few days, students will see first roots and then stems with small green leaves.
- 4. Ask students to identify different seeds they find around their homes, e.g.: com, beans, peas, peanuts, peppercorns, coffee beans, seeds in fruits and vegetables.
- 5. Ask students to find and bring to class as many different examples of leaf shapes that they can. Remind them that needles are leaves
- 6. The program describes how plants need sunlight to grow. Here is an experiment students can do that shows how plants will try to reach sunlight.

Cut a hole about 3 inches or 8 centimeters in diameter in a large cardboard box. Put a small potted plant inside the box and close the lid. Then put the box in a sunny place. Water the plant enough to keep the soil moist. After a week ask students to look at the plant. The stem will have bent toward the light coming from the hole.

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GLOSSARY

cactus: a type of desert plant that can survive dry conditions by storing water in its stem. It is characterized by sharp spines that are a form of leaves.

carbon dioxide: a gas in the atmosphere that plants use during photosynthesis.

cone: part of a conifer that contains the tree's seeds.

conifer: any of a group of cone-bearing trees or shrubs.

desert: a dry, often sandy region.

evergreen: plant that retains its leaves through all the seasons.

fern: class of seedless shrubby plants that reproduces with spores.

flower: reproductive structure of some seed-bearing plants. It often has colorful blossoms.

leaf: flat part of a plant attached to a stem; usually green. Photosynthesis takes place in a plant's leaves.

moss: type of plant that is often very small and does not have flowers or seeds.

oxygen: a gas released into the atmosphere as a product of photosynthesis.

photosynthesis: process by which plants make their own food using the energy of sunlight, water, and carbon dioxide. Through photosynthesis plants also produce oxygen.

rain forest: forest characterized by a great deal of rainfall. Many rain forests are found in the tropics, but there are also temperate rain forests.

redwood: type of very tall evergreen conifer that can live for hundreds of years.

root: usually underground part of a plant that anchors it to the ground and takes in water and minerals.

seed: part of a plant that can grow into a new plant.

stem: stalk or trunk of a plant. It carries water and minerals from a plant's roots to other parts of a plant.

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SCRIPT

Narrator:

Look at the world around you. What kinds of living things do you see?

Boy:

I see birds, and a frog.

Girl:

I see a bug.

Narrator:

All these things are alive, but are there other kinds of living things?

Girl:

A flower.

Girl and Boy:

A tree!

Narrator:

Wherever we live, plants are a part of our lives, but plants seem different from us and other living things in many ways. Plants don't see with eyes or hear with ears. They can't walk or run. Instead most plants remain rooted to one place in the ground.

But plants are like other living things in many other ways. Like animals, plants grow, and they change over time.

A tiny seedling on a forest floor may grow to be a tall tree.

Like other living things, plants eventually die. Dead trees lie fallen across the ground, slowly rotting.

Plants can be very different. For example, some plants live only a short time. These desert wildflowers live only a few weeks after a rare rain.

Other plants, like these redwoods, can live hundreds, even thousands of years, enough time to grow hundreds of feet into the air.

Many people find that the different kinds of plants are as interesting to learn about as animals. This is Margaret Conover, a botanist. A botanist is someone who studies plants.

Margaret Conover:

I've liked plants ever since I was very little. We grew plants around my house...in the house and outside. We grew vegetables. As I grew up I seemed to always want to have plants around me.

There are many different kinds of plants. We have very small mosses and ferns, which are really beautiful. There are trees that have their seeds in cones. We call them conifers; and then the trees and plants that you mostly see around you are the flowering plants.

Narrator:

Plants live in many different kinds of places. Some live in the water. Many live in tropical rain forests. Others live in the desert, but no matter where they live, plants need some of the same things that animals need to stay alive.

Think of the things you need to live.

Girl:

We need water to drink.

Narrator:

Like us, plants need water. What do you think will happen if plants don't get enough water?

Here's a way to find out. Get two plants that are the same kind. Both plants should be healthy and as much alike as possible. Water one plant every couple of days, but don't give any water to the other.

Then, after about a week or so, compare the two plants.

Boy:

The plant that got water looks all right. The plant that didn't get water looks dry and sick.

Margaret Conover:

If plants don't get enough water they will begin to wilt. You see if a plant is wilting because its leaves begin to droop. If it gets a little more water it can revive and come back to life, but sometimes if it has lost too much of its water it will die.

Narrator:

All plants need water, but some plants, like these cactus plants, live where it may not rain for months at a time.

But a cactus has special features that help it survive.

Margaret Conover:

Whenever it rains, a cactus will take up as much water as it can through its roots and carries it up into its trunk where it stores it for a very long time. If it hasn't rained all summer long, that water is there inside the trunk of a cactus and can be used by the plant to continue growing.

Narrator:

Besides water, think of something else you need to live.

Boy:

We need food.

Narrator:

Food gives us energy. We need this energy to move...to think..to be alive.

Plants also need energy. But most plants get their energy from somewhere else.

Children:

From the sun!

Narrator:

Plants can trap the energy of sunlight just like we get energy from eating food.

How important is light for plants? Here's another experiment you can do to find out.

Boy:

I got two plants that are the same kind. I left one in a window where it can get lots of light, but I left the other one in a closet where it couldn't get any light. This time, I gave both plants the same amount of water.

Narrator:

What do you think will happen to the plants after a couple of weeks?

Your teacher can pause the video here to let you answer this question. Otherwise the program will resume in ten seconds.

Graphic gives the teacher an opportunity to pause the program.

Narrator:

What happened to the two plants? Lets take a look.

Boy:

The plant that got water and light looks healthy. The plant that got water but no light looks sick. It looks like it's about to die

Narrator:

Plants need the energy light in order to make their own food. To make food plants also need water, which usually comes from the soil, and a gas in the air called carbon dioxide. Using these three things plants make a kind of sugar they need to grow and live. This process is called photosynthesis.

In addition to food, as part of photosynthesis plants also make a gas called oxygen. The oxygen we need to live comes from plants. Every time we take a breath, we breathe in oxygen made by plants.

So, plants—like other living things—need water; and they need energy.

Plants are like other living things in another way. Animals reproduce. That means they make more of the same kind of animals.

Plants also reproduce. They make new plants. Many kinds of new plants grow from seeds. These beans are seeds. Each bean can grow into a new bean plant. The kernels on this ear of corn are also seeds. Each kernel can grow into a new corn plant.

Inside each seed, such as a corn kernel, there is a tiny plant and food that allows the plant to grow.

In the right conditions, the plant will break out of the coating that surrounds the seed; and you'll be able to see the different parts of the plant, such as the roots and tiny leaves.

Living things have different parts that help them in different ways. Think of your own bodies.

Boy:

I see with my eyes. I hear with my ears. I walk with my legs.

Narrator:

Just like us, plants have different parts, and each part helps a plant live.

Leaves, for example, are where most plants capture the energy of sunlight. There are many different kinds of leaves. Some are large and broad. Others are thin and very small

In some plants, like this tree, the leaves change color in the fall when it gets colder; and then the leaves die and drop to the ground. During the winter, the branches are bare. In the spring, new leaves grow. This pattern of leaves growing, changing color, dying and falling repeats itself year after year with the changing seasons.

Other plants—called evergreens—keep their leaves all year round even in the winter. This hemlock is an evergreen. Its leaves are called needles.

When we look at a plant, usually we see only a part of it...like the trunk and branches of this tree.

We normally don't see a plant's roots, the part of the plant that is underground. Often a plant's roots are its biggest part. A plant's roots anchor it to the ground, but roots have other purposes, too. If you look very closely at a root you can see tiny root hairs. These take in water and minerals from the soil. Plants need these things to grow.

Water from the roots of this oak tree, for example, travels up the trunk and reaches the branches and leaves at the very top of the tree.

A tree's trunk is its stem. The stems of most plants grow above the ground and support the leaves, flowers, and other plant parts.

Boy:

Some stems are hard and woody...like the trunk of a tree.

Girl:

Other stems are soft...like the stem of a flower.

Narrator:

Stems have tiny tubes in them. Water and minerals flow up these straw-like tubes to leaves and other parts of a plant.

Here is an experiment you can do. Put a white flower, such as this carnation, into a glass filled with water containing red food coloring. What do you think will happen to the white flower petals if you leave the stem in the colored water for several hours?

Your teacher can stop the video here to let you answer this question.

Graphic gives the teacher an opportunity to pause the program.

What happens to a white carnation when its stem is left in colored water?

The stem carries the colored water to the flower, which also becomes colored. This proves that stems carry water to other parts of a plant.

Plants are useful to us in many ways. In fact, we couldn't live without plants. We've already seen that the air we breathe contains oxygen we need to live...and that plants make this oxygen.

We also depend on plants for food. Take a bite out of a hamburger. The sandwich will have meat, a roll, and maybe some lettuce.

The hamburger roll is made from wheat which is probably grown on farms in the Midwest. The lettuce is grown on other farms, perhaps in Arizona or California. Without plants we also wouldn't be able to eat the hamburger meat itself. The meat comes from cattle, and the cattle are able to live and grow because they eat grass.

Plants can also be used to make things. Trees are used to provide wood for houses and to make paper.

The shirt you're wearing right now may be from cotton. Cotton is a plant. Part of the plant can be made into thread, and woven into fabric used to make clothes and other things.

Botanists like Margaret Conover are interested in plants for still other reasons.

Margaret Conover:

Plants provide many of our important medicines. For example, aspirin comes from plants. We believe that there are many important medicines plants produce that we don't even know about yet. For instance, in the rain forests there are thousands of different plants that might have a cure for a disease.

Narrator:

Plants are useful in other ways. They brighten our lives. We can enjoy the beauty of the different kinds of flowers and plants in a garden...their different colors and different shapes.

We can admire the enormous variety of plants, from giant redwoods to tiny mosses.

We can appreciate plants in many different places, from the different kinds of cactus in a desert to grasses growing at the edge of an ocean.

Wherever we live, plants are truly an essential part of our lives.

The End

Mamo				
Name	_	-		

Date _____

Word Review

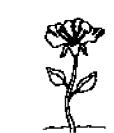
Fill in each blank with the best word from below.

evergreen	siem see	o botanist xi	rygen plants	roots lenf
1	is an	important gas m	ade by plants.	
2	are li	iving things such	as trees, flowe	rs and grass.
9. An	pl	lant keeps its lea	ves year-round	I.
4. A	is t	he part of a plan	t that catches s	unlight.
5. A tiny	ca	n grow into a wh	ole new plant.	
6. A	sup	oports the leaves	алd flowers of	a plant.
7	absor	rb water and min	erals from the	soli.
8. A	is s	someone who stu	ıdies plants.	
~~~		now,	be a little seed but someday e a huge tree.	

# Kinds of Plants

There are many different kinds of plants in the world. To learn more, answer each question below.

1. Circle the plant that is the oldest.



2. Circle the plant that lives in the desert.





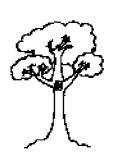
3. Circle the plant that is an evergreen.





4. Circle the plant that has a soft stem.





5. Circle the plant that lives in water.





# How We Use Plants

Each person pictured below is using a plant. Match each plant name on the left with the person using it on the right.

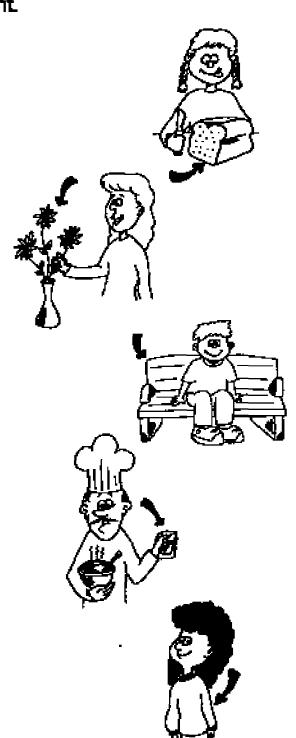
1. TREE

2. COTTON

3. WHEAT

4. TOMATO

5. FLOWER

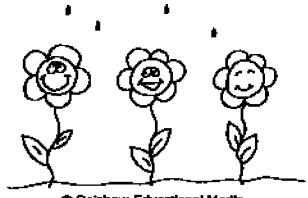


# True or False

Write a "T" beside each true sentence and an "F" beside each false sentence.



- 1. ____ Plants can see and hear.
- 2. ____ Without water, a plant will get sick and die.
- 3. ____ Plants use sunlight and water to make food.
- 4. ____ Roots help a plant catch the energy of the sun.
- 5. ____ Some plants keep their leaves year-round.
- 6. ____ We use trees to make furniture and paper.
- 7. ____ Trees cannot live in the desert.
- Many plants can live without sunlight.



O Reinbow Educational Media

Date _____

### Word Search

Look up and down in the puzzle to find the words below. Circle each word you find.

PLANT FLOWER TREE ROOT STEM LEAF SEED WATER

G R J T Н M Р D J В K M Н Р R O Q S Ε E 0 G Ν J Α D D Ε T Ν Р Н Т Υ G Ν Q Ε E C M S В ٧ N T R S S Ζ M R J W Т W L Ε Α F C Α 0 Ε Р Α M T Ε Ν L S X R D G J Ε F W 0 E 0 L 0 R Ζ G E K M В R L M C

# Plant Parts

Read each fact below. Write an "S" if the fact is about a STEM. Write an "L" if the fact is about a LEAF. Write an "R" if the fact is about a ROOT.

- 1. ____ In the fall, this can change color.
- 2. ____ A plant is held in the ground by this.
- 3. ____ This supports a plant's leaves and flowers.
- 4. ____ This helps a plant catch the energy of sunlight.
- 5. ____ On an evergreen plant, this won't fall off in winter.
- 6. ____ Tiny hairs on this take in water from the soil.
- 7. ____ One example of this is a tree trunk.
- 8. This can be flat or needle-shaped.

root

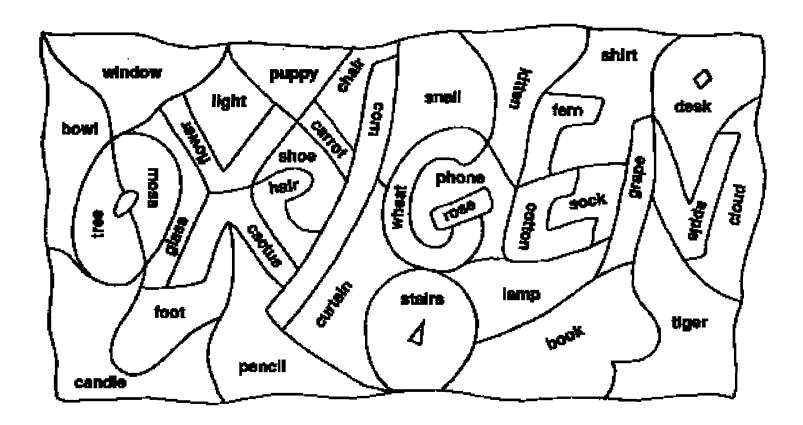
stem

Date _____

### Color Puzzle

Color the shapes WITH plant names green.

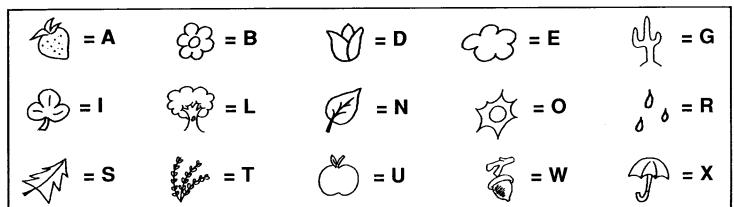
Color the shapes WITHOUT plant names brown.



When you're done, you'll see an important thing that plants give us. What is it?

# Making Food

Use the Secret Code to find out how plants make food.

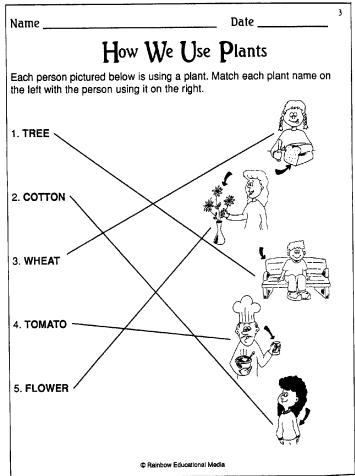


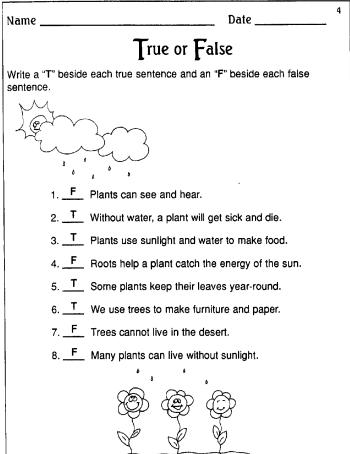
- 1. To make food, plants need water from the
- 2. Plants also need carbon ______ from the air.
- 3. Using the _____, plants can make the food they need to live.
- 4. If a plant cannot make food, it will _____
- 6. This food gives plants the energy to ______.

### Solutions for Pages 1-2

Name	Date 1	Name	Date ²
Word <b>R</b> eview	w	<b>K</b> inds of	Plants
Fill in each blank with the best word from below.		There are many different kinds of plants i answer each question below.	n the world. To learn more,
evergreen oxygen stem botanist seed	plants roots leaf	Circle the plant that is the oldest.	
1. Oxygen is an important gas made by	y plants.		
Plants are living things such as tre  3. An evergreen plant keeps its leaves ye	ear-round.	2. Circle the plant that lives in the desert.	
4. A leaf is the part of a plant that of a stem supports the leaves and f	ew plant.	3. Circle the plant that is an evergreen.	
7. Roots absorb water and minerals  8. A botanist is someone who studies		4. Circle the plant that has a soft stem.	
i may be a li now, but so l'il be a hu	omeday 🗸	5. Circle the plant that lives in water.	
© Rainbow Educational Media		© Rainbow Education	onal Media

### Solutions for Pages 3-4





### Solutions for Pages 5-6

Name5	Name Date ⁶
$oldsymbol{W}$ ord $oldsymbol{S}$ earch	<b>P</b> lant <b>P</b> arts
Look up and down in the puzzle to find the words below. Circle each word you find.	Read each fact below. Write an "S" if the fact is about a STEM. Write an "L" if the fact is about a ROOT.
PLANT Flower	1. L In the fall, this can change color.
TREE ROOT	2. R A plant is held in the ground by this.
STEM LEAF	3. S This supports a plant's leaves and flowers.
SEED WATER	4. L This helps a plant catch the energy of sunlight.
P L J D T H M G R L	5. L On an evergreen plant, this won't fall off in winter.
L M H P R J B K O Q A D N (S) E E D) J O G	6. R Tiny hairs on this take in water from the soil.
N P H T Y G N Q T E T R E E C M S B V N	7. S One example of this is a tree trunk.
LSZMRJWTWS	8. L This can be flat or needle-shaped.
PCAOEA(LEAF) GRNLDSXMTE	stem •••)
J F L O W E R O E O M C Z G E K M B (R) L	root
· · · · · · · · · · · · · · · · · · ·	The state of the s
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### Solutions for Pages 7-8

	301utions in
Name	Date ⁷
Color F	uzzle
Color the shapes WITH plant names gree	en.
Color the shapes WITHOUT plant names	brown.
bowl bowl shoe	hook tiger

Name		Date	. 8			
Making Food						
Use the Secret Code to find out how plants make food.						
€ = A	( = D	← = E	g/s = G			
=1 =L	# = N	() = 0	δ _δ = R			
= S = T	<b>=</b> U	<b>€</b> = W	<b>⊕</b> = x			
1. To make food, plants need	water from the	SOIL SOIL				
2. Plants also need carbon DIOXIDE from the air.						
3. Using the, plants can make the food they need to live.						
4. If a plant cannot make food, it will						
5. The food that plants make is a kind of SUGAR.						
6. This food gives plants the energy to						