Lesson: “How do plants and trees grow?”

VIDEO TRANSCRIPT

EXPLORATION VIDEO 1

Hi, it's Doug! If you're like I used to be, I never paid much attention to plants. They just sit there. They're so still. It's so easy to forget about them. But there are some really interesting plants. Many of them you can even buy and have in your home or your yard. Like, maybe you've seen these. They're cactuses. There are some really cool cactuses out there. There are also some really colorful plants, like these. This kind is called a bromeliad. They're from the jungle. They do really well inside of people's houses. Now, where I live, I have one that's reddish-orange like this growing in my house. Here's the bromeliad’s cousin. Now, this is maybe my top favorite plant that I own. Do you recognize that? That's a pineapple right there. This is a pineapple plant. It's where pineapples come from. I found this at a plant store for $10. I couldn't believe it. But actually, let me show you one of my other favorite plants I have. It's this little tree. Trees are plants too, they're just a special kind of plant. A plant that has wood and grows tall. Now, speaking of tall, this one, it's just a baby tree, but it's not just any tree. It's a baby Redwood tree from California. When Redwood trees grow up, they're the tallest trees in the world. I just love having a little baby one knowing that one day, it's going to get so tall. I'll have to plant it in a forest once it gets bigger so that it has room to grow. You can find interesting plants all around you. Plants growing outside. Plants in the forest. Plants in the garden. Plants that people keep inside. There are so many different kinds of plants that you can grow at home. Once you

become a plant keeper, here's something to think about, though. If you're going to leave for a trip and you're gone for a few weeks, you'll need someone to take care of your plants. You'll need a babysitter for your plants–you'll need a plant-sitter. Now that's a strange word you don't hear every day, a plant-sitter. Why would you need someone to take care of your plants if you're going to be gone?

EXPLORATION VIDEO 2

Plants—things like trees, and flowers, and grass, anything that has leaves—they're all living things. Now, I know plants don't look like you or me, and they don't look like animals. They're not animals. But they are alive. And so they need to drink water, just like you, me, and animals do. Now, plants don't have mouths, but you might know that they soak up the water in their roots, like when it rains. So if you're a plant keeper, and you're gone for more than a few days, the reason you need a plant-sitter is for them to come and water your plants. Otherwise, the plants will go thirsty and they'll die. Is there anything else a plant needs besides just water? Well, I want to tell you a story about a tree. There was this big, old tree growing in a field of grass. Like any tree, it cast a big shadow on the ground. On a bright sunny day, if you sat near the base of the tree, it would look dark where you were sitting. The tree blocked the sunlight above. Now one day, a powerful storm passed by. The wind was gusting. The branches on the tree were swaying back and forth very wildly. As the wind blew stronger and stronger, the old tree got knocked over. Now it looked like this. It's sad that such a huge tree got knocked over, but something new happened. Next to the big tree, a little tree had been growing. Year after year, it never got very big. But once the big tree got knocked over, suddenly, in just a few months, that little tree grew bigger, and bigger, and bigger than it had ever grown before. Within just a few years, it got so big that it started to take the place of the old tree that had fallen over.

Everywhere we look in forests, we can find baby versions of big trees. When the big trees get old and fall over, or get knocked over in a storm, the little trees around them start to grow big. Now, why do you think that is? Why do you think that little trees start to grow when the big trees get old and fall over?

ACTIVITY INTRODUCTION VIDEO 1

In today's activity, you're going to do an experiment to learn about what plants need to grow. You'll do it by growing plant seeds in a paper cup. You won't be growing a tree because trees take a long time to grow. Instead, you'll grow seeds from a different plant. They look like this. Do you know what these seeds will grow up to become? Each of these little seeds grows up to become radish plants. A radish is a plant that grows like a carrot. The part you eat grows underground. Today, your job is to find out whether a plant can grow without sunlight. What do you think will happen? I'll walk you through how to get started, step by step.

ACTIVITY PART 1 STEP 1

Before we get started, discuss this question. When you're done with this step, click the arrow on the right.

ACTIVITY PART 1 STEP 2

Here's our idea: we can make two cups of seeds and put one cup next to a sunny window so that it gets lots of light, and put the other cup in the dark, like wrapped up in aluminum foil so that no light can get in. Then, after a few days, we can look at them side by side and see what happens. Let's try that out. Go to the next step and we'll get started.

ACTIVITY PART 1 STEP 3

If you're in a group, find a partner. If you aren't in a group, you can work alone. You'll need to do a little more work if you're by yourself, but you'll get to grow two sets of radishes.

ACTIVITY PART 1 STEP 4

Get your supplies.

ACTIVITY PART 1 STEP 5

Write your name on your label.

ACTIVITY PART 1 STEP 6

One partner needs to put a big X on their label. Decide who will do that. Remember, only one of you needs to write an X.

ACTIVITY PART 1 STEP 7

Put your label on your cup.

ACTIVITY PART 1 STEP 8

Pour the radish seeds on the plate. Each person count out ten seeds, like this.

ACTIVITY PART 1 STEP 9

Sprinkle your ten seeds on top of the soil in your cup. Then have someone spray the soil and seeds with water. You need to make sure the seeds stay damp so that they'll grow.

ACTIVITY PART 1 STEP 10

Put the cup that is not marked with the X next to a window in the sunlight.

ACTIVITY PART 1 STEP 11

Cover the cup that is marked with an X in aluminum foil so that it's nice and dark. If you have more than one cup marked with an X, you can put all of them in a box or a pan and then cover them.

ACTIVITY PART 1 STEP 12

Discuss. Who do you agree with? Why do you think that?

ACTIVITY PART 1 STEP 13

For the next four days, spray your seeds with water every day. Don't forget to put the seeds marked with an X back in the dark after spraying them. After four days, come back and watch the next videos.

ACTIVITY INTRODUCTION VIDEO 2

Hi, it’s Doug! A few days ago, you planted some radish seeds in two different cups of soil. You've been watering the seeds. Seeds need water to sprout and become plants. You've been keeping one cup of seeds somewhere sunny and one cup in the dark, where it got no sunlight. Now it's time to look at your two cups side by side and see what happened. I'll show you how to get started, step by step.

ACTIVITY PART 2 STEP 1

Get a "Draw the Radishes" worksheet, a pencil, and some crayons or markers.

ACTIVITY PART 2 STEP 2

With your partner, get the cup that was in the dark and the cup that was in the light, and find out what happened.

ACTIVITY PART 2 STEP 3

Look at the cups side by side on the worksheet. Draw and color what you see in each cup. Afterward, go to the next slide to watch the final two videos.

EXPLORATION VIDEO 3

There are lots of interesting plants. Plants with colorful flowers, plants that grow the food we eat, plants that we can find in the forest, plants that we can grow in our homes. And plants are living things. They're alive, just like animals. Now, they don't have legs, so you won't see them walking

around. And they don't have mouths or eat food the way we do, but they do grow, and they move. They have needs, like they need water. And they have other needs too. When a big tree falls, a little tree can now get more sunlight. Do plants need sunlight to help them grow? We all just did an investigation to find out. Here's what happened in our investigation. We found out that the seeds in the light sprouted and grew. Now they're little baby plants. And each day, they grow a little bit more. One day soon, they'll be full-grown. They're green, and they even have little leaves starting to grow. What about the seeds in the dark? Well, surprisingly, they grew too, actually. Here's what they looked like. Well, look at them. Now you might have been surprised to find out that the seeds in the dark did grow. They don't look too different from the ones in the light. They have little leaves, too, and they grew just as tall as the seeds in the light. So, wow, does this mean that plants don't need sunlight? Well, let's look closely at them both side by side. Which of these two plants do you think is healthier, the one that grew in the light or the one that grew in the dark? Why do you think that?

WRAP-UP VIDEO

If you've heard that plants need sunlight to grow, it might have surprised you that the seeds in the dark grew. What is going on here? Well, you could find out if you kept trying to grow the plants in the dark. If you want to do that and find out without me telling you what happens, you can stop this video. But if you want to find out now, I'll go ahead and show you. I'll wait a moment so that if you want to stop the video, you have time. Okay, you ready? I'll show you. This is a sped-up video taken by scientists that shows what happened to some of the seeds that are left in the dark. So you can see, if we keep a plant in the dark for a few weeks, pretty soon it will begin to die. But what if we let the radish seeds keep growing in the sunlight? Well, this is what we get. You can see that these grew up to become healthy plants. So plants definitely

need sunlight in order to grow. Sunlight and water are both needs that plants have. You might have noticed that the plants in the dark weren't turning green like the ones in the light were. That's a sign that they're not healthy. Almost all plants have some parts that are green, usually their leaves. In fact, next time you're walking around and looking at plants, that's a sign you can look for to guess if the plant is growing well. If you have any plants at home and you notice they start to lose their green color, it might mean they're not staying healthy. Maybe they're not getting enough water or not getting enough sunlight. Hey, that gives me an idea. What do you think will happen to the radish seeds that were growing in the dark if we now put them in the sunlight? Try this out when the video is over. Keep them watered and you'll find out what happens after they've been in the sun for a day. You can even draw a picture on a new worksheet to show what happened. If you like growing plants, I hope you'll become a plant keeper. There are so many interesting plants. Have fun and stay curious!