mystery science

Lesson: “Why do plants give us fruit?”

VIDEO TRANSCRIPT

EXPLORATION VIDEO 1

Imagine you go on a walk in the park. You take a deep breath of fresh air, and suddenly, you smell something really, really sweet and flowery. You look behind you and see why. The smell is coming from flowers—not just a single flower, tons of flowers, all of them on a single tree. It's a tree covered in sweet-smelling flowers. When you get home, you send a message to your friend, who's away on vacation. You promise her you'll take her to see and smell this tree when she gets back. Two months later, your friend comes back from vacation. It feels like it's been forever. So you take her to the park, and you walk toward the tree. But when you get to the tree and look up, you see that the flowers are gone. At first, you're bummed, but then you can hardly believe your eyes. In the place where there were flowers, the tree is now full of pears? What's going on here? It's almost as if the flowers turned into pears. But you've already learned that flowers are seed makers. You look down on the ground beneath the tree. There were no seeds anywhere on the ground, just pears up in the tree. So where are the seeds the pear flowers should have made?

EXPLORATION VIDEO 2

Have you ever eaten a pear? What's the one part you don't usually eat, or you spit out if you do? It's the seeds, right? The inside of a pear contains seeds that the flower made. Now to help

you see how this happened, let's watch a sped-up video showing the flowers on the pear tree. This video has been sped up over two months. Let's watch. First, we see that the petals fall off the flowers. OK. Now let's focus on this flower. Watch what it does over two months' time. OK, I'm going to pause, and let's zoom in on this one, and we'll keep watching it. Now, where the arrow is pointing shows where the petals on the flower used to be until they fell off. Let's keep watching what it does over two months. Did you see that? It turns out that the flowers on the tree turn into pears, and the pears contained the seeds on the inside. But did you notice that the whole flower didn't turn into a pear, just one part of the flower turned into a pear? What part of the flower turned into the pear?

EXPLORATION VIDEO 3

You've already learned how flowers need to get pollinated—that's what has to happen in order for plants to create seeds. But once a flower gets pollinated, what's going on inside the flower exactly? Why is it that the flower getting pollen on its sticky stigma causes it to form a seed pod? Scientists got curious and so wanted to look inside the part that contains the sticky stigma. They cut open that middle part of the flower—they dissected it—and inside there, at the bottom of that long stalk that has the sticky stigma on the end, here's what it looks like when they cut it open. They found out that before a flower gets pollinated, there are tiny little eggs in there. You heard me right, I said eggs. These are plant eggs. Plants have eggs, just like many animals do, too. Now, the fancy Latin word for eggs is ova, so the part containing the eggs, which we might call an egg chamber, scientists call it the ovary. When a flower gets pollinated, pollen travels down from the sticky stigma into the egg chamber or ovary and combines with the eggs inside there. It's only once the pollen reaches the eggs that now they begin to develop into seeds, which can grow into new plants. So a plant's ovary or egg chamber—this middle part of the flower that's

down below the sticky stigma—once pollen gets down in there, that becomes the plant's seed pod. But with a pear flower, something extra happened. Not only did the eggs in the flower's ovary become seeds, but the ovary itself swelled up into sweet tasty stuff which surrounds the seeds. That's the pear fruit. The same thing happens with other fruits too, such as an apple. Apple flowers start out like this, but once pollen gets onto the eggs inside their ovaries, they drop their petals. And the ovary of each flower swells up into an apple. Next time you eat an apple, stop and think about where the flower petals used to be. You know this is the stem—that's the part that grew off the branch—notice how it's woody. And then if we look on the other end of the apple, we can see where the flower petals were. You can even see some leftover of them. You can use your imagination then and picture how the apple is just part of the apple tree flower. The flower petals were right here. And this part, what you call the apple itself, is the flower's ovary. Inside the apple, we see the seeds, which were growing inside the ovary. Let's check out one more example of a fruit you know. See this flower? You can see the ovary is starting to swell up. Can you tell what it's going to be? Let's fast forward a few months later, when the flower has dropped its petals and the flower's ovary has fully swelled up. Are you ready? It's a watermelon. Crazy. Did you know that watermelons began as flowers? Yep, every fruit begins as a flower. And don't forget, flowers are seed makers. You can see the seeds of the watermelon right here. In fact, you can always tell if something is a fruit by cutting it open and looking for seeds. A fruit is a tasty container full of seeds. But not all plants grow tasty containers around their seeds. Remember these? These are the ovaries of what was once a maple flower. Some plants grow delicious fruit around their seeds as the ovary swells up, like apple and pear trees. And for other plants, like maple trees, the ovary is not tasty. Why do some plants grow delicious fruit around their seeds? What's the point?

EXPLORATION VIDEO 4

Do you like to eat fruit like cherries or strawberries? Yes? Well, animals really like to eat fruit, too. Animals like raccoons, squirrels, and foxes, they'll eat fruits like cherries and other berries. Some animals eat the same fruits we do. Bananas are eaten by monkeys, which love them. Oranges have been known to be eaten by squirrels. And some fruits, such as these berries, are poisonous to us. But they're OK for certain animals. These birds eat lots of these berries. And think about it. When an animal eats the fruit, it also eats the seeds inside. Animals are constantly moving around, so eventually the animal goes somewhere after eating, and when it takes a poop, it also poops out the seeds. So the seeds get moved away from their parent plant in this way. In the place where the seeds fall when the animal poops them out, a baby plant sprouts and grows up. Now we can answer our question. Why do plants make fruit? Well, plants like to move their seeds away so that they can spread to new places. Some plants, like the maple tree, use the wind. But some plants make fruit, and they do this to move seeds away using animal power instead of the wind. A fruit is a tasty container for seeds, which can be eaten. Once an animal eats fruit, it usually walks away with it, and so the seeds or the plant gets spread.

EXPLORATION VIDEO 5

But now hold on a second. If a fruit is part of a plant we eat that has seeds in it, what's with this green pepper then? It's not a fruit. If you've ever helped chop up vegetables, you might know that many vegetables have seeds in them, too, like green peppers. Well, we can see, even here from this photo, that the pepper started out as a flower. And eventually the ovary of that flower swelled up into a green pepper. So does that mean a pepper's actually a fruit? And what about

other vegetables with seeds in them? Are they fruits, too? If you ask a plant scientist, they'll tell you that, yes, a pepper is a fruit. Any vegetable which has seeds in it is a fruit, according to a plant scientist. Now, if you ask a chef or someone who works in a grocery store, they might remind you. You wouldn't put a green pepper in your fruit salad, would you? So at the grocery store a pepper is considered a vegetable. Neither the grocery store nor the plant scientist is wrong. Now, what you might be thinking, aah, fruit or vegetable, how can they both be right? Both of them are right because it depends on what situation you're in. The word fruit has two meanings. At the grocery store, fruits are apples and oranges and bananas and so on, the tasty seed containers that are usually sweet. But to a scientist, the word fruit includes even some vegetables. Here's how a scientist thinks of it. If it's got seeds and it's surrounded by a thick container, then a scientist says it's a fruit. A green pepper has seeds surrounded by a thick container. So to a scientist, the green pepper is a fruit.

ACTIVITY VIDEO 1

We are going to play a game called Science Fruit or Science Vegetable? It's your job to think like a plant scientist and figure out what's a fruit and what's a vegetable. To a plant scientist, a fruit like this apple has seeds in it. A vegetable doesn't have seeds in it. So to figure out if a food is a fruit, you're going to take a look at a slice of it and search for seeds. If you find seeds, then you know it's a science fruit. If you don't find seeds, then you know it's a science vegetable. Remember, you're thinking like a plant scientist, not someone at the grocery store. To play the game, you need a worksheet, a pencil or pen, and a toothpick. When you're done with this step, press the arrow on the right.

ACTIVITY VIDEO 2

All right, now that you have your supplies, listen carefully and I'll tell you what's going to happen. Pay attention. If you don't listen, you won't know how to play. Here's how it's going to work. Your teacher is going to hold up five different foods, one at a time. With each food, you're going to decide whether you think it's a science fruit or a science vegetable. You'll do this by answering the first question on your worksheet. It's the question that says: What do you think it is? If it's a science fruit, you'll circle that. And if it's a science vegetable, you'll circle that. Don't do this now. Wait until we start playing and your teacher holds up each food. That's when you can guess what you think it is. Then, after your teacher has held up each of the five foods and you answered the first question five times, your teacher is going to pass out slices of each food. What you'll do is, you'll take each slice and look carefully to see if you can find seeds. If you do see them, you'll dig them out with your toothpick. And then, when you do that, you can answer the second question there on the worksheet. Finally, as the very last thing, the class will talk about what they discovered and you'll decide together if each food was a science fruit or a science vegetable. Now get ready to pay attention to your teacher and play Science Fruit or Science Vegetable. We're going to leave the directions up on the screen for you.