Lesson: “Why do you find flowers and bees together?”

VIDEO TRANSCRIPT

EXPLORATION VIDEO 1

Hey, it's Jay from the Mystery Science team. Have you ever been outside on one of those perfect spring days? The sun is shining, the leaves are green, the flowers are blooming, and of course, the bees are buzzing. Wherever you find flowers, you often find bees. Bees and flowers just kind of go together, like peanut butter and jelly or shoes and socks. But why? Why do bees and flowers hang around each other so much? Like, check this out. This bee is flying from flower to flower and crawling around on each flower. Maybe you've seen a bee do something like this before. It kinda looks like it's smelling the flowers. But is that really what this bee is doing? Let's take a closer look. This is a video of a bee who has landed on some flowers. What do you see? What do you think the bee is doing?

EXPLORATION VIDEO 2

It might be a little hard to tell what's going on here. But see that? Something long and thin like a tongue is sticking out of the bee. This bee is drinking something that's inside the center of the flower. There's actually a liquid inside the flower. It's a tiny pool of sugar water called nectar. When you see bees crawling around inside a flower, that's what they're doing. They're looking for the flower's nectar. That's why bees spend so much time flying around from flower to flower because each flower contains a sweet little snack for them. Every time a bee stops at a flower,

the bee gets something it needs: food. But what about the flower? It must be kind of rough on these flowers to have bees bumping into them all the time, drinking up their nectar. Does this hurt the flower? Or does it help the flower somehow? Let's get up closer to a flower. Maybe that can help us figure out what's going on. This is a flower called a poppy. Usually, what stands out about a flower is its petals, like these. But there's more to notice here. Let's take a closer look at the other parts of this flower. You might even draw it to see what you notice.

EXPLORATION VIDEO 3

There's a lot going on in this flower besides petals. For example, you might have drawn lots of lines coming out from the center with dusty, colorful stuff on the ends of them. That stuff is a powder called pollen. Powdery pollen falls off super easily, and that means it gets everywhere. You might also have noticed this thing in the middle here. This part of a flower is called a stigma. If you touch a stigma, it feels sticky. When a bee lands on a poppy, it may be heading for the nectar deep in the center. But chances are, it's going to bump into these other parts too. The powdery pollen and the sticky stigma. And these parts are not just here for show. Take a look at this. These are poppy seeds. Poppy seeds grow inside poppy flowers, but they don't grow automatically. Something has to happen in order for these seeds to grow in the flower. And that's where these other parts come in. If pollen gets on the sticky stigma, then the flower grows seeds. That's a huge deal for a plant. A plant needs seeds to make new baby plants. A poppy only forms seeds if some pollen gets on the sticky stigma. No pollen, no seeds. And it's healthiest for the seeds if the pollen comes from a different poppy flower. But here's the thing, a flower can't just grab some pollen and sprinkle it on its sticky stigma the way that you might sprinkle some glitter on an art project. No. Flowers don't have hands, and they can't walk around. They don't have feet either. So how could pollen get from this poppy here to that poppy

over there? That's all the way across the garden. What if the poppy didn't have to do all of this by itself? Do you think this bee could help move pollen all the way across the garden? Take a closer look at this bee's body. What do you think?

ACTIVITY INTRODUCTION VIDEO

In today's activity, you're going to find out if a tiny bee could help move pollen from one flower all the way across a garden to another flower and help that plant make seeds. We don't have real flowers today, and we can't bring real bees into your classroom. So instead, you'll be making models. A model is a pretend version of the real thing. First, you'll make a model of a flower, then you'll make a model of a bee. Your model bee won't look exactly like a real bee, but it is fuzzy, just like a real bee. Once you've made your models, you'll fly your busy bee from flower to flower. Then you'll see what happens. Can your busy bee move the pollen and help the flowers in your garden? We'll show you how to get started, step by step.

ACTIVITY STEP 1

In this activity, you'll work with a partner. If you're working alone, that's okay too, but you'll need to make two flower models. When you're done with this step, click the arrow on the right.

ACTIVITY STEP 2

Get these supplies. You'll get more supplies later.

ACTIVITY STEP 3

First, let's color your plant stem and leaves green so that it looks more like a real plant. It doesn't have to be perfect. I'll set a timer for one minute in case that's helpful. Okay. Time's up. Go to the next step.

ACTIVITY STEP 4

Now let's add your flower to your plant. This is going to be the model for your flower. First, use your glue stick to add glue to the circle, like this. Then place this right over the circle and press down gently so that it sticks to the glue. It should look like this when you're done.

ACTIVITY STEP 5

Your flower model is pretty simple right now, but as you saw earlier, flowers actually have lots of different parts. So you'll draw some of those parts. In the center of a flower, there's sweet nectar. In a real flower, it's hard to see the nectar, but it's what your bee will be looking for. So we're going to draw it bigger and more colorful in our model. Color a big purple circle in the center of your flower, like this, to represent the nectar. Just like in your other flower drawing, there are also lots of these little lines with pollen on the ends. We suggest you draw them in orange like this.

ACTIVITY STEP 6

There's one more important part of your flower that's missing: the sticky stigma. Let's make one now using a sticky label. One of you, hold out your thumb, then partner, peel the back of the sticky label. Wrap it loosely around the top of your partner's thumb, like this, with the sticky side

out. Make sure the sticky side is out. Then put it in the center of your flower and press down, like this.

ACTIVITY STEP 7

Go ahead and switch jobs. Make a sticky loop around your partner's thumb so they can add a sticky stigma to their flower. Remember to make sure that the sticky side is out.

ACTIVITY STEP 8

In a moment, you're going to add pollen to your flower model. To make sure the pollen ends up in the right spot on your flower, place a small cup upside down in the center like this.

ACTIVITY STEP 9

Get your final supplies, pollen. This is another model. It's not real pollen, but it's similar to the real thing. Each table group of students needs two different colors of pollen. You'll share these supplies.

ACTIVITY STEP 10

You and your partner will each use a different color of pollen in your model flowers. Take a big pinch of pollen and sprinkle it around the cup like this. Make sure you and your partner each use a different color. Your flowers should look like this when you're done.

ACTIVITY STEP 11

Now it's time to make your bee model. You're going to use a pipe cleaner because it's fuzzy just like a real bee. We suggest you watch this entire step first and then try it for yourself. You'll start at one end of the pipe cleaner and fold the top down four times like this. One, two, three, and four. Then you'll take the end and wrap it around four times in this direction like this. One, two, three, and four. Your model bee should look like this when you're done. Okay. Go ahead and make your busy bee now.

ACTIVITY STEP 12

Your flower model is almost complete. One more thing to do is to remove the cup so you can see the sticky stigma. So go ahead and lift up your small cup and put it off to the side. Then, look at your flower model and discuss these questions with your partner. How is your model similar to a real flower? How is your model different from a real flower?

ACTIVITY STEP 13

In a moment, your bee is going to visit some flowers. But first, discuss this question as a class. What is the bee looking for in the flower?

ACTIVITY STEP 14

It's time for your bee to visit some flowers. Remember, your bee is searching for the sweet purple colored nectar in each flower. Let your bee search for nectar in your partner's flower first.

Make sure your busy bee gets to all the nectar you can see. Then fly over to your flower and search for nectar in your flower. Buzz back and forth from flower to flower a few times. Okay, I'll put a timer on screen for two minutes in case that's helpful. Okay, time's up. Go to the next step.

ACTIVITY STEP 15

Look really closely at the sticky stigma on your flower to see if there's pollen on it. Discuss questions one and two from your worksheet as a class. What color pollen is on your sticky stigma? How did it get there? Once you've had a chance to discuss together, write down your answers on your worksheet.

ACTIVITY STEP 16

Now look carefully at your bee. Discuss questions three and four from your worksheet as a class. Did your bee move pollen from one flower to another flower? How did it do that? Once you've had a chance to discuss together, write down your answers on your worksheet.

WRAP-UP VIDEO 1

In the activity, your model bee visited model flowers to drink nectar. But as it traveled from flower to flower, it carried something with it: pollen. And some of that pollen got on the sticky stigma of the next flower it visited. That means that flower can make seeds. For a plant to grow new plants, it needs to make healthy seeds. And to make healthy seeds, it needs to get pollen from another similar flower on its sticky stigma. That's not easy for something that doesn't have hands or feet. Luckily, the flower has help: bees. When a bee flies into a flower to drink nectar, it gets pollen stuck to its fuzzy body along the way. Then, when it flies to the next flower, it carries that pollen with it. Some of that pollen shakes off in the new flower, and it sticks to the sticky

stigma. You saw this happen with your model bee and model flower. This whole process, pollen traveling from one flower to the stigma of another flower, is called pollination. Pollination is a win-win for bees and flowers. They both get something they need. Bees get a sweet drink of nectar, and flowers get to grow healthy seeds. This is why you see bees and flowers together so often. Bees aren't the only pollinators. You may have seen other animals hanging out around flowers too. Many animals drink nectar from flowers, and many of them also have body parts that naturally collect pollen. See if you can tell where pollen will stick to these other animals.

WRAP-UP VIDEO 2

A bat's fuzzy face is very different from a hummingbird's long beak. Their bodies have different structures—different shapes and sizes. But when bats and hummingbirds visit flowers, their body parts can do the same thing: pick up and carry pollen. What something does is called its function. When these animals visit flowers, their different body parts have the same function. They move pollen. The flower in our model was based on a poppy. But poppies aren't the only flowers that need to be pollinated to grow seeds. Many, many flowers have pollen and sticky stigmas like poppies do. Like on this flower, this is where the pollen is, and this is the sticky stigma. On this one, the pollen is here, and the sticky stigma is here. On this one, the pollen is here, and the stigma is here. These parts are really different shapes and sizes on different flowers. In other words, these flowers all have different structures. But even though they look different, their structures have some things in common. On all these flowers, the pollen is light and powdery, so it easily sticks to visiting pollinators. And these different-looking stigmas are all sticky, so pollen sticks to them. Those similarities are helpful because these plant parts all do the same thing. They have the same function. They help the flower get pollinated, which helps it make seeds. It's incredible when you think about it. A little sprinkle of this dust over here, and

the flower can grow a seed, something that can grow into a whole new plant. And so many different kinds of animals can help pollinate so many different kinds of plants. Pollinators keep all these flowers growing and healthy. So next time you see a bee flying around some flowers in the park on a sunny day, remember, it's on an important mission. Have fun, and stay curious.