

## What Is Pollination? (A Sticky Question)

(Music)

Summertime breeze or bird  
Bee or butterfly  
Flower to flower they all go  
Taking pollen from one  
Giving to another,  
That's the way that all plants grow.

Jim: Well, what do you think guys?

Girl 1: Boy, there sure are a lot of flowers in here.

girl 2: And they're real pretty, too.

Boy 1: And they smell good, too.

Boy 3: They sure do.

Jim: Did you ever wonder where plants and their flowers come from?

Girl 1: That's easy. They come from seeds.

Jim: That's right. But where do seeds come from?

Boy 2: From old plants, I guess.

Jim: Okay. Let's take a look at these older plants over here.  
Do you see any seeds on them?

Boy 1: They might be in here.

Girl 2: That's just an old flower.

Jim: You're both right. The flower is where the plants seeds come from. Now the seeds from this flower will scatter soon. The flower is the seed making part of the plant. Today we are going to learn how the birds and the bees and the wind help plants make seeds. First, we're going to take a close look at a flower, because that's where it all happens. Come on, I'll show you.

Jim: This is Ms. Rode. She's a Botanist. She studies and works with plants.

BOY 2: Can I be a botanist?

Jim: Sure you can. In fact, today you will be botanists. Because you'll be studying plants.

Girl 2: What is Ms. Rode doing? Painting the flowers?

Jim: Well, it looks like that. But actually, she's pollinating the flower.

Boy 1: Pollinating? What's that?

Jim: Well, pollinating is what happens when pollen moves from one flower to another. Pollinating is the first thing that happens when plants make seeds and new plants.

Girl 1: What's pollen?

Jim: It's a sticky powder. Look, here's some right here. Ms. Rode is moving the pollen from one flower to another.

Boy 1: She's pollinating the flower?

Jim: That's right. The flower has the parts that make the seeds. And of course, new plants grow from seeds.

Girl 2: Do people have to bend them all like that?

Jim: No. There are too many plants for people to do the pollinating. Think about all the plants in the forest and the fields. It takes a lot of pollinating for all those plants to have seeds.

Girl 1: Yeah, you'd need a lot of botanists.

Jim: (Laughs) Come on.

Ms. Rode: Bye.

Jim: Bye now.

Jim: So what we want to find out today is how pollen moves from one flower to another in nature. Now first, we need to take a really close look at a flower so we'll know its various parts. Here on the table there's a flower for each of you and a magnifying glass. And then we have these large models of flowers so that we can see the parts more easily.

Boy 1: Mine's yellow with things sticking up in the middle.

Boy 2: Mine's orange and it has stripes inside.

Girl 2: Mine's different. It's purple.

Jim: Now flowers can have different sizes, shapes, and colors. But remember, they're basically the same. They have the same basic parts. Now, let's take a look at the flowers real close. See on my model here, these are the petals. And see these long pieces at the top, those are called stamens. Now each of you take your magnifying glass and see if you can find them on your flower.

Boy 1: There's a bunch of them!

Girl 1: There's something on top of them.

Girl 2: Is it pollen? It looks like powder.

Jim: Right. And remember when pollen is moved from one flower to another, that's called pollination. Now touch the pollen with your finger.

Boy 2: It sticks. The pollen came off on my finger.

Jim: Okay. Now look at the part in the very center of the flower.

Girl 1: It's different than the stamens.

Jim: That part of the flower is called the pistil.

Boy 2: Like a gun?

Jim: No. It sounds the same but it's spelled differently. It's spelled p-i-s-t-i-l. The pistil and the stamens are the key parts of the flower for making seeds.

Girl 2: Do all flowers have them?

Jim: Well, take a look at your flowers. Now some flowers, like these, have both. But some only have the pistil and others only have the stamen. Remember, all flowers are not alike.

Boy 1: Is this the pistil?

Jim: It sure is.

Girl 1: Why are the stamen and the pistil so important?

Jim: Well, the pistil is where the seeds grow. But there's something they need from the stamen, first. Remember what stuck to Allen's finger.

Girl 2: You mean the pollen.

Jim: Right.

Girl 1: That's what Ms. Rode was doing.

Boy 1: Yeah. She took it from one flower and put it on another one.

Allen: Can we do it?

Jim: You sure can. Let's move the plants over here. Give everybody one. And then I'll give you each a pencil. Then what we'll do is use the eraser end of the pencil to move the pollen from the stamen of one flower to the pistil of the other.

Girl 1: Cool!

Jim: There's one for you and one for Allen... That's right. Put it on the pistil of another flower. Now you're pollinating the plants. Pollen has to be carried from the stamen of one flower to the pistil of another. And when that happens this flower can make seeds.

Girl 1: Can I take pollen from a rose and put it on a violet?

Jim: Well, you could but no seeds would grow. You see, roses need pollen from other roses. And violets from other violets. Here take a look at this. Now this is a plant that was already pollinated. See the seeds.

What are the seed making parts of a flower?

The stamen, the pistil, pollen.

When pollen is carried from the stamen to the pistil, the flower can begin to make seeds.

(MUSIC)

What does a plant need

To make a new seed?

Three things give flowers

Reproductive powers--

the sticky pollen,

the slender stamen,

and pistils make the flower whole.

Jim: So pollen has to make a trip from the stamen to the pistil. How do you think that happens?

Allen: I bet the pollen just falls off the stamen onto the pistil.

Jim: Well, it might on some kinds of flowers, but not on these. In fact, not on any of the ones we're using today. Here, let me show you one. Look at this. See? The pistil is taller than the stamen. In fact, many flowers can't use pollen from their own stamen. They need pollen from another flower, from another plant of the same kind. So, what pollinates the flowers? Can you name some of the pollinators?

Girl 2: Seeds blow in the wind. Does pollen?

Jim: That's right. Pollen is moved by the wind from one flower to another. Now what are some other pollinators?

Girl 1: I know. Bees! They're always on flowers in the summer.

Jim: That's right. They carry pollen from one flower to another. What are some other pollinators?

Boy 1: I know. Birds!

Jim: Well, some kinds of birds. You've probably seen hummingbirds hovering around a flower. They move the pollen from flower to flower.

Allen: How about butterflies? I see them sitting on flowers.

Jim: Yep. Butterflies are good pollinators.

Girl 2: And moths?

Jim: Them, too.

Boy 1: Is that all the pollinators?

Jim: Well, those are the main ones. Some other insects will carry pollen. Even mammals, too. But that's unusual.

So what pollinates the flowers?

Wind.

Insects like bees, butterflies, and moths.

Birds.

(MUSIC)

What gets the pollen going

To keep new plants growing?

Different kinds of birds do,

Or the wind that's blowing.

Butterflies and bees,

Tarry pollen they need.

That's what makes pollination work.

Allen: How does the wind pollinate the flowers?

Jim: The wind really moves the pollen around. May be you've seen the T.V. weather report or heard the pollen count. That's a measure of pollen in the air.

Girl 1: My dad says that pollen makes him sneeze.

Jim: Well the wind really does get the pollen moving. Although usually you can't see it.

Girl 2: But the pollen is way down inside my flower. The wind can never reach it.

Jim: No the wind can't reach inside your flower. It can only pollinate certain kinds of plants. Come on. I'll show you.

Jim: The wind blows the pollen from grasses, trees like oaks, maples, and willows, and other plants. And since the wind does such a good job of pollinating, there's no reason for them to attract pollinators. So, they have flowers with no petals or petals that are very small.

Boy 1: It doesn't have bright colors like mine did.

Jim: Notice anything else?

Girl 1: It doesn't smell like mine did.

Allen: They sure don't.

Boy 1: Look at this one. The stamens are sticking straight out.

Jim: Hey! You're very observant. The stamens and the pistil are out in the open so the wind can carry the pollen from one flower to the pistil of another. Now, usually they're smaller. But there are lots and lots of flowers and when a plant has a lot of flowers

chances are better that pollen will land on one of them.

What kind of flowers are wind pollinated?

Small flower with many flowers on each plant.  
Flowers with no scent or smell.  
Flowers that are not brightly colored.  
Flowers with pistils and stamens longer than the flower.

(MUSIC)  
If the flowers not scented,  
Or brightly colored,  
And the flowers are smaller  
In clusters tighter  
With stamens longer  
the signs are stronger  
This plant spreads pollen on the wind.

Boy 1: How do the birds and insects pollinate the flowers?

Jim: Well, let's find out. See, there's a bee at work over there. Notice the hairs on his body and legs.

Girl 1: It getting pollen all over itself.

Girl 2: Yeah, the pollen is really sticking to him.

Jim: Right. The pollen sticks to the bee's hairs.

Girl 1: So now what happens?

Jim: Well, when the bee goes to the next flower, chances are that it will rub against the pistil and some of the pollen will stay there.

Boy 1: So the bee is pollinating the flowers.

Allen: And he doesn't even know it.

Jim: That's right. And the other pollinators, butterflies, moths, and hummingbirds work the same way. As they go from flower to flower, they're actually spreading pollen around.

Allen: Why do birds and insects pollinate flowers, Jim.

Jim: That's a good question. Actually pollinators aren't doing this work for the plants on purpose. They don't say, "I think I'll go pollinate that flower."

Boy 1: So what happens?

Jim: Actually the birds and insects are looking for something.

Girl 1: Like something to eat?

Jim: Exactly. Flowers reward pollinators by giving them tasty meals.

Girl 1: Do pollinators eat the flowers?

Jim: No, not really. But there is nourishment inside the flowers. Here take your magnifying glass now and look inside your flowers. Pretend that you're the size of a bumble bee.

Boy 1: Wow! It's like a big cave in there.

Girl 1: I can see the stamens and the pistil.

Jim: Those aren't the kind of things the bees eat. What else is in there?

Boy 1: Pollen?

Jim: That's right. Pollen is a very important food and a lot of pollinators depend on it.

Boy 1: But if they eat the pollen, how can the flowers be pollinated.

Jim: Well, the bees eat some of it. But a lot of it sticks to their body and their legs and gets carried to the next flower. And remember, it only takes one grain of pollen to pollinate a flower.

Girl 2: The bee's working for the flower.

Jim: That's right and he's being well paid with a good meal, isn't he? You know some flowers have another kind of food called nectar that insects and birds really like. And bees use nectar to make something that people really like.

Girl 1: I know. Honey!

Jim: That's right. And nectar is a favorite of another kind of bird that is fun to watch.

Boy 1: A hummingbird.

Jim: Some plants have flowers that are especially attractive to hummingbirds. The nectar is deep inside the flower so it takes a long bill like the hummingbird's to reach in and get it. And also the hummingbird can stay still while it's flying like a helicopter. So the flower doesn't need big petals for it to land on.

Allen: How does the hummingbird move the pollen?

Jim: Well, the stamens and the pistils stick out so it gets pollen on its bill and feathers. Then that pollen gets rubbed off when it goes to the next plant. Hummingbirds are actually very good pollinators.

What kind of flowers are pollinated by birds, insects, and other animals?

Flowers that have pollen and nectar.

Flowers that are usually brightly colored.

Flowers that are scented.

(MUSIC)

When bright colored flowers

Have a sweet perfume

And a sugary nectar

Then the chances are good

That birds and insects active

Find the plants attractive

And they'll spread the pollen as they go.

Jim: Okay. Now we're going to play a question and answer game about pollination. Are you ready? All right. What do you think might pollinate this flower?

Girl1: I don't know

Jim: Well, let's look. See, the nectar is way down inside there.

Girl 2: It's too small for a bee.

Girl 1: It's maybe a hummingbird or a butterfly.

Jim: Right! Now, this one with the stamens hanging out.

Boy 1: Wind. It doesn't have very bright colors.

Allen: And the stamens are hanging out.

Jim: Very Good. Now, what do you think might pollinate this one?

Girl 2: A bee.

Girl 1: Yeah, it could sit right on top.

Jim: Very good. You kids are all right. Now, here's another question. How do the plants and the pollinators work together?

Boy 1: Well the plants have pollen and nectar.

Allen: And that's food for the birds and the bees.

Jim: That's right. And while they're eating the pollen and the nectar they're actually pollinating the plants. Plants and pollinators have a partnership that really works. So the next time you see a pretty, nice-smelling flower...

Girl 2: With a bee or bird flying on it...

Jim: You know they're working together to make seeds that make new plants and well, make this world a pretty attractive place. Come on, let's go see some more.

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