

## Transcript for *Bill Nye the Science Guy* | Photosynthesis

- This corn is fresh. It's brand new. But it's made by the oldest living things on Earth, plants. ♪  
Bill Nye, the science guy ♪ ♪ Bill Nye, the science guy ♪ ♪ Bill, Bill, Bill, Bill ♪

- Hi, friends, Al Gea here. You wanna talk about selection? We got it all here. You want something green, take a look at this. Huh, this baby's nicer than my own lawn at home, and it is loaded. It's been completely re-seeded, it's filled with chlorophyll, and there are no moles, no mushrooms, no dandelions. This baby is ready to mow! ♪ Bill, Bill, Bill, Bill, Bill ♪ ♪ Bill, Bill, Bill, Bill, Bill ♪ ♪ Bill Nye, the science guy ♪

- [Narrator] Brought to you by plants. They're nothing to sneeze at.

- Did you know that without plants there would be no animals on earth? That includes animals like us humans. See, in a way, plants make all the air we breathe and all the food we eat. Different types of plants live all over the world in different places, and plants keep the whole world alive. Plants are amazing. See, plants take energy from the sun and make their own food. Now, when we say food, we mean sugar. For example, here's an apple, and apples are sweet, but it's a different flavor from, say, sugar from a sugar cane or orange juice from an orange or maple syrup from a maple tree. Different types of plants make different types of sugar. Take a look at this. If we burn the sugar, at first it'll turn brown. That's caramel. It's sweet, and it's good, but if we let it keep going, caramel burns, and it turns black. That's what we call carbon, and it forms a gas called carbon dioxide. That's carbon hooked up with oxygen, carbon dioxide. Now, this carbon dioxide goes up this tube and bubbles in this special detector liquid. Pretty soon, with enough carbon dioxide, it's gonna turn a different color, a kind of orange-y yellow, but it takes a minute.

- [Narrator] Is it soup yet?

- It's almost almost ready.

- [Narrator] Ah.

- See, the detector chemical has changed color, it's not blue anymore, it's orange. That's because we were making carbon dioxide gas. It's the same gas we make all day, all the time, every time we breathe. Watch, here's some of the same detector chemical.

- See, it's changed color because I'm giving off the same gas as in that chemical reaction. Now, plants can do the same chemical reaction only the other way around. Plants take in carbon dioxide from the air and give off oxygen. Take a look at this. It's the same blue indicator liquid, and it stays blue because these plants are absorbing carbon dioxide and giving off oxygen. Now, this process where plants take in water and sunlight and make food is called photosynthesis. It means making from sunlight. Now, the key to photosynthesis is a green chemical called chlorophyll. Chlorophyll is what makes you get grass stains on your pants when you fall down. Now, plants take in carbon dioxide given off by animals and fungus and some other plants and make oxygen, which animals like us breathe. See, it's a great deal for everybody. Mm, plant's sugar, it is a good deal.

- When plants make food, they put the oxygen that we breathe into the air. It's photosynthesis, and you can see it using this piece of lettuce. Just put the piece of lettuce in a jar full of water. Then turn the jar over into a bowl. And fill the bowl with water. Then put the jar in a place where it'll get lots of sun. Wait about 24 hours. See those little bubbles? That's oxygen that the lettuce is making by exchanging carbon dioxide and water for food. Woo, ain't that funky now? Hi, how 'bout this? This is nicer than my own lawn at home, and you wouldn't do this on a Beamer. Hey, friends, come on down, and see me today!

- Plants have found ways to live all over the earth, even where you least expect it.

- Well, the car's covered with grass. Let's go. Plants! You ready?

- [Cameraman] Yeah!

- Plants are everywhere! Yep, it's a grass-covered vehicle. It's a plant-mobile is what it is.

- [Child] Bill Man, the science guy, huh?

- Yeah, yeah.

- [Child] You look different!

- [Motorcyclist] Bill Nye, the science guy!

- [Bill Nye] Hiya, guys.

- [Child] You can't hardly breathe in here.

- [Bill Nye] Yeah you can! You know they say cars and plants don't mix. It's okay! You know, all living things depend on plants. The car's not alive, but the grass is.

- [Person In Helicopter] What do you mean what color is it? It's a grass car, it's green!

- See the air rushing over the blades of grass? Taking carbon dioxide from the air, light from the sun and water, and the grass is making its own food, it's growing. It's also making oxygen for us to breathe. The water, well, we provide that when it rains or when we hose it down from time to time. It's science. Science! It's a lot of work, it takes a lot of energy to make an apple pie. Just think how much energy it takes an apple tree to grow an apple. Now, why do they do it, why do they bother? Well, please, consider the following. See, apple trees are plants, and they can't move around. They're stuck, they're planted, they're plants for crying out loud! So, they have to find a way to spread their seeds out. See, plants don't want the young plants growing underneath them, otherwise they'd be competing for the same patch of soil and the same patch of sunlight. So, plants like apple trees grow these big, yummy, delicious fruit, bringing tremendous amount of water up to their roots, getting a tremendous amount of energy from the sun, just so that animals will come along and take the fruit somewhere else. See, the fruit isn't used for fertilizer, it's used only to get animals to carry the seeds to some new place so that the seeds will grow away from the old trees. That's the only reason apple trees make apples. Isn't that wild? See, plants have all kinds of tricks for moving their seeds around, like dandelions use the wind. And maple trees make these cool helicopter seeds. See, plants have this whole thing figured out. Well, it's a good use of energy when you think about it. Thanks for joining me and consider the following.

- [Man On TV] Each seed of the dill weed plant is attached to a feather-like carrier. The wind carries the seeds away to a new area for growth, perhaps the distance of several miles.

- [Narrator] This is Master Plant Theater.

- Good evening, I am Aleister Appleseed. Fruit, as we all know, is the part of the plant where the seeds are stored. Plants that want their seeds moved by a hungry bird or animal produce fruit that is tasty and good-looking. Take for example the tomato. Thank you. Note the attractive red color and the taste is delicious. An animal would be inclined to eat this fruit. The seeds would pass through the digestive system and into the soil, which one hopes would lead to more tomatoes. Thank you. Fruit, an amazing way that plants have adapted to living on earth.

- [Aleister] Thank you.

- [Child] Here you go. Take that!