

STEM Learning Videos

Pesticides – Final

Carlos learns about pesticides.

Characters:

- Carolina
- Jorge (expert)
- Juanito
- Elena
- Isabela
- Carlos
- Alejandro
- Party extras

SCENE 1 **Carolina and Jorge’s Patio**

There are tables and chairs set up with some decorations—tablecloths and balloons. On one table we see some citronella candles and fly paper strips. Juanito is playing on and eating the grass. Jorge is placing and lighting citronella candles on the other tables.

JORGE: Does that taste good, Juanito?

Juanito looks up. Mouth full of grass. Carlos approaches from the driveway carrying a bottle of pesticides without a label.

CARLOS: This is going to save the party!

Carlos sets the bottle on a table.

JORGE: What is it?

Jorge inspects the bottle.

CARLOS: Bug spray! I got this from my cousin who works for a pest control company. This stuff will kill anything!

Jorge sets the bottle down.

JORGE: That’s what I’m worried about...

Carlos, not listening, grabs the bottle and mimes pouring the contents of the bottle out dangerously close to Juanito.

CARLOS: All we need is a spray nozzle, spray a little around all the tables...

Jorge lunges forward and grabs the bottle. Juanito looks up, trying to get the grass out of his mouth.

JORGE: Whoa! Pesticides are poison! And Juanito puts everything in his mouth. I can't have that here!

Juanito spits out a blade of grass. Jorge sets the bottle down again.

CARLOS: What's the problem? Pesticides are everywhere. The city was spraying the weeds along our road just the other day.

Carlos picks up one of the candles.

CARLOS: They'll work better than this.

JORGE: Pesticides can get rid of pests like bugs and weeds, but they can also be harmful to people. If you are exposed to pesticides when you use them, right after exposure, even a small amount can cause a rash, burning eyes, and vomiting. A large amount can cause coma and even death. Down the road, pesticides can cause other problems, like slower learning in children and increased risk for Parkinson's disease and dementia in adults. Pesticide exposure may also increase your chances of getting cancer, and they may interfere with your ability to have children.

Jorge takes the candle back and lights it. Juanito coos.

JORGE: It's like what Isabela says about plastics: It's impossible to avoid pesticides completely but you should limit your exposure whenever possible.

Jorge places the lit candle on one of the other tables.

Exposure + Genetics Version

CARLOS: All these different chemicals to worry about! I just don't understand how chemicals and some other things around us can cause problems.

Carlos inspects the candle he's been holding. Jorge returns to the table with the candles on it.

JORGE: We have been looking into ways to keep our family safe. We found some videos that explain how chemicals can affect our bodies. And pesticides contain lots of chemicals. Hang on, look.

Jorge pulls up a video on his phone.

Chemicals and other substances in our environment can affect our bodies in different ways. First, some chemicals and some substances can change our genes inside our cells. These genes give cells the instructions they need to function. Genes are made up of DNA. Changes to some parts of the DNA are called mutations. Mutations are permanent. Exposures to cigarette smoke can cause mutations and can lead to certain diseases, like cancer.

A second way chemicals and our behaviors can affect us is by changing how our genes work, without causing mutations. These changes are called epigenetic changes and can turn some genes on and other genes off. Some epigenetic changes can be harmful and some beneficial. Unlike mutations, many epigenetic changes are only temporary. Being exposed to things like cigarette smoke can cause mutations, but can also cause epigenetic changes that scientists think are harmful. On the other hand, behaviors, like exercise, can cause epigenetic changes that scientists think are beneficial.

There is also a third way chemicals and substances can affect us. Sometimes chemicals and substances, like lead, can be harmful, and have nothing to do with our genes. For example, lead can cause harm by interfering with the way nerve cells talk to each other without affecting our genes.

Chemicals in pesticides can also have harmful effects that do not affect our genes. Pesticides affect the body's normal processes. We know that people exposed to pesticides are more likely to get certain diseases.

CARLOS: Wow. It's just all so complicated!

Jorge lights another candle and places it on one of the other tables.

Jorge points to the fly paper strips.

JORGE: Why don't you put up some fly paper strips instead. They won't give you a rash or cause nausea like pesticides...and they'll only kill bugs!

CARLOS: Do these work?

Jorge returns to the table.

JORGE: They're not perfect, but they're safe.

Jorge picks Juanito up. Carlos grabs a fly paper strip.

JORGE: The food will be beside the house so you can hang some there. I'm gonna take Juanito in, but I'll give you a hand in just a minute.

CARLOS: Okay.

Carlos walks over to the house and hangs up one of the strips. Jorge walks toward the house with Juanito.

JORGE: And...can you get rid of that?

Jorge looks at the bottle of pesticides.

CARLOS: Uh, yeah...

Carlos walks to the table and picks up the bottle. He looks toward the garage and back to the bottle.

CARLOS: I guess I'll just give it back to my cousin.

Jorge takes Juanito inside. Carlos takes the bottle of pesticides back to his truck.

SCENE 2 Carolina and Jorge's Living Room

Carolina and Isabela are sitting on the couches, taking a short break. Alejandro sits beside Isabela, staring at his phone. Juanito is playing with toys on the floor.

CAROLINA: Isabela, have you had any luck getting Carlos to exercise with you?

ISABELA: Uh...some. I do worry about him because of his father's health...

*Juanito reaches out to Isabela. She leans down and offers her hand.
Juanito grabs her finger.*

Exposure + Genetics Version

ISABELA: We know he has an increased risk of some diseases, since your father had them and you both inherited half of your genes from him.

Juanito goes back to Alejandro's shoes. Isabela sits up.

ISABELA: So, we're trying to decrease that risk as much as possible by living a healthy lifestyle. But that's hard to do!

They laugh. Reflexively, Juanito laughs. Both Alejandro's shoes are untied.

Elena is clearly upset, but waits to speak.

ELENA: Well!

CAROLINA: Mom, it's true! Dad had a lot of health problems that Carlos and I may have to worry about too.

Elena raises her hands in protest.

ELENA: Your father—

CAROLINA: He didn't have the healthiest lifestyle, Mom! But if Carlos and I can eat better and exercise and limit our exposure to chemicals, we have the best chance of staying healthy.

Elena stands and begins to exit.

ELENA: I want everyone to be healthy too, but I'm going to set out the food.

CAROLINA: Mom, don't be mad!

Elena leaves. Carolina looks over at Isabela.

ISABELA: She'll be okay. I'll give her a hand.

Isabela gets up.

Isabela exits. Alejandro tries to follow, but doesn't notice that Juanito has tangled his shoe laces. He falls. Juanito laughs and claps.

SCENE 3 Carolina and Jorge's Patio

The party is in full swing. The tables are all filled with people. The flypaper is up, the citronella candles are burning, and the food is out and in glass containers with lids (!). Everyone is singing the final verse of "Las Mañanitas."

EVERYONE: Ya viene amaneciendo, ya la luz del día nos dio. Levántate de mañana, mira que ya amaneció.

During the song, two kids, both around 6 years old, investigate one of the flypaper strips that is now covered in flies. Kid One pushes Kid Two who almost falls into the paper. Kid Two chases Kid One.

Everyone cheers for the end of the song.

Our main characters are all sitting together at the same table. (Seating order: Jorge, Juanito, Carolina, Elena, Carlos, Isabela, Alejandro.) Carlos leans back in his chair. Alejandro—well, we know what he's doing.

CARLOS: Those beans were so good, Mom! Did you do something different?

Carolina and Isabela make eye contact.

ELENA: No, I cooked them with oil, just like I always do.

Carolina stifles a laugh. Juanito laughs.

CARLOS: Well they were delicious.

ISABELA: Did you tell your mom that you quit smoking?

ELENA: No he didn't! I'm proud of you, Carlos!

Elena pinches Carlos on the cheek.

JORGE: I'm proud of you too.

Jorge and Carlos laugh. Juanito grabs a piece of watermelon and takes a bite.

CARLOS: Thanks! It's only been about 24 hours so far, but at least it's a start!

CAROLINA: I finally convinced him that secondhand smoke is bad for—well, him and everyone else.

JUANITO: Uh-oh....

Exposure + Genetics Version

CAROLINA: He does not want the smoke to cause [searches for word]...mutations.

Carolina smiles broadly as she remembers the word. Juanito claps.

CAROLINA: I know not all mutations are harmful, but some can cause diseases.

Carolina smiles at Isabela and offers a sippy cup to Juanito.

Exposure + Genetics Version

CAROLINA: And you're exercising now, right Carlos?

Carlos playfully glares at Isabela.

ISABELA: She asked!

CAROLINA: Exercise is good for you. It can lead to [searches for word] epigenetic changes. Better to prevent it than lament it.

Carolina smiles and leans over to Juanito.

Juanito smiles.

JORGE: Well, Birthday Boy. Is it piñata time?

Juanito squeals.

SCENE 4 Carolina and Jorge's Patio

Main characters are huddled around the piñata now hanging from the tree in the yard. A few of the other party-goers are also in the crowd, as are the two flypaper kids. Alejandro is there, but still on his phone.

Carolina holds Juanito and a bat. Carlos is holding the piñata rope. Jorge holds a camera, ready to take a picture.

JORGE: Are you ready, Juanito?

Juanito smiles.

CAROLINA: One...two...three!

Carolina and Juanito swing at the piñata. Just before the bat makes contact with the piñata, cut to black.