



# **Nuestra Familia Sana**

## Lesson 1

### Secondhand Smoke

# What is Secondhand Smoke?

## Transitional question

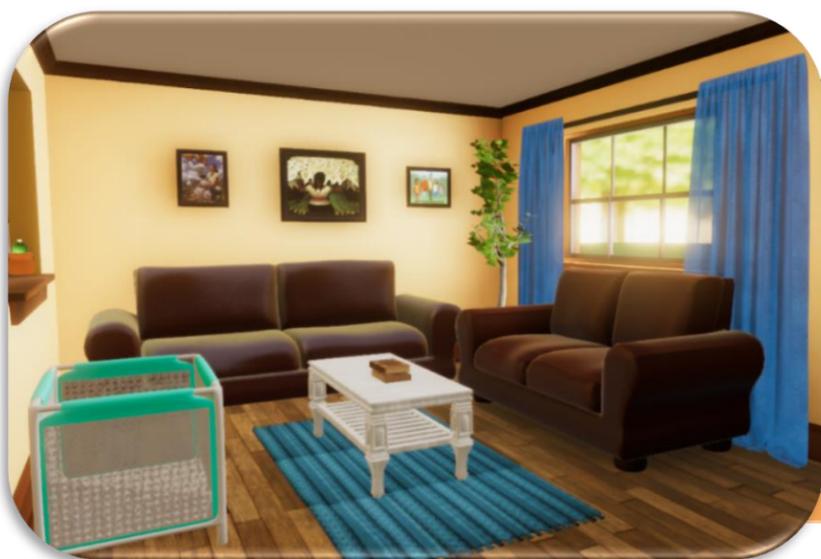
- After viewing the video about Jorge and Carolina and their family, how would you describe secondhand smoke?
  - Turn to next page after discussing the question.

# What is Secondhand Smoke?



**Secondhand smoke** is smoke from burning tobacco products like cigarettes, pipes, or cigars.

Secondhand smoke is also smoke that is **exhaled** by a smoker.



Secondhand smoke **residue** can linger on any surface for a long time.

Tobacco smoke contains more than 7,000 chemicals. Hundreds are toxic and about 70 can cause cancer.



# What is Secondhand Smoke?

- ❖ Secondhand smoke is smoke from burning tobacco products like cigarettes, pipes, or cigars.
- ❖ Secondhand smoke is also the smoke that is exhaled by a smoker.
- ❖ This smoke can enter your lungs when it is in the air.
- ❖ Secondhand smoke residue can linger around on surfaces and cause harm a long time after the smoker has stopped smoking.
- ❖ Tobacco smoke and residues contain more than 7,000 chemicals, including hundreds that are toxic and about 70 that are known to cause cancer.



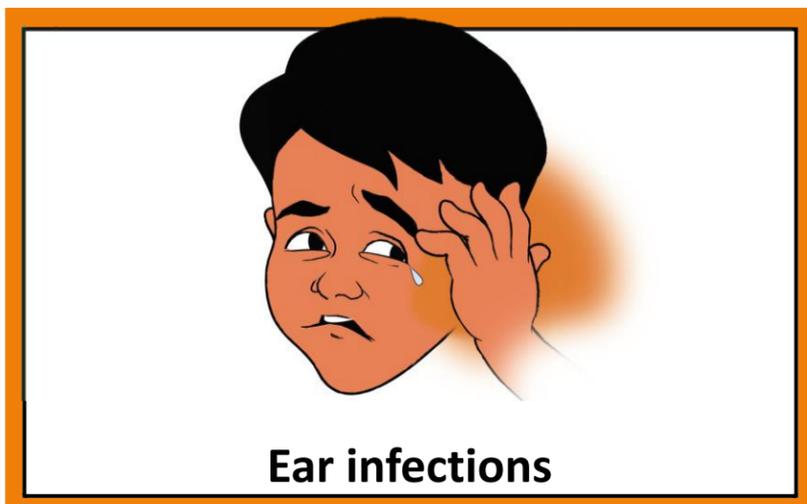
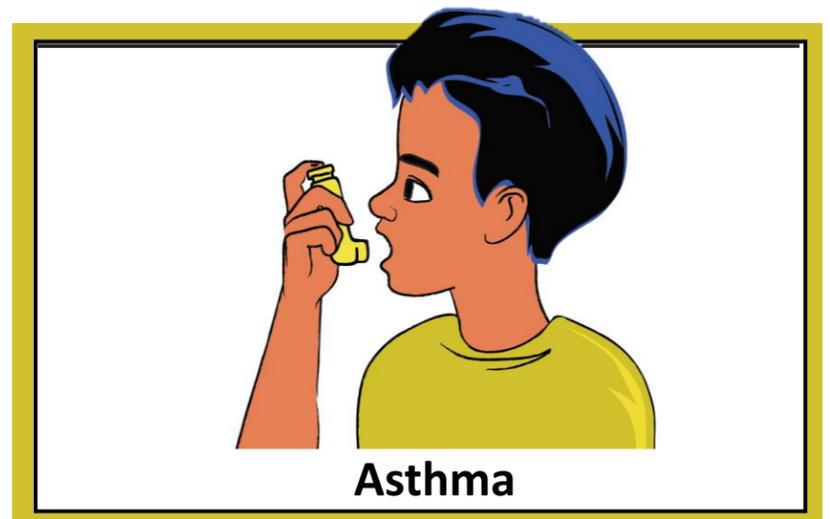
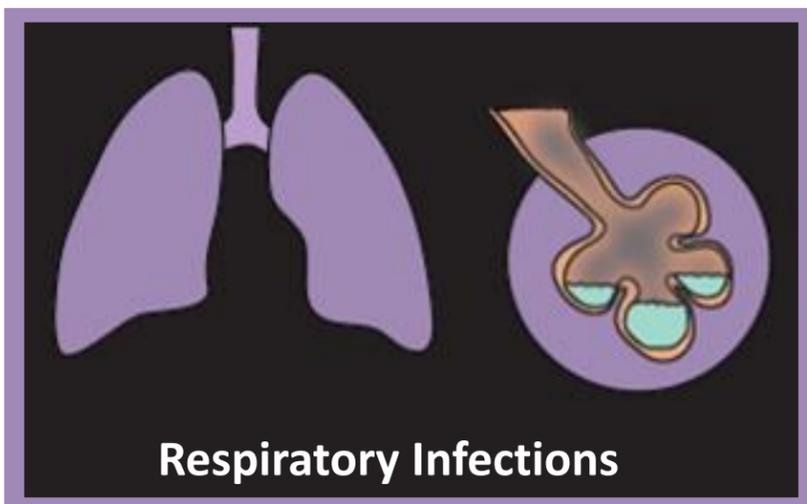
# What Are Health Effects of Secondhand Smoke?

## Transitional question

- Carolina was concerned about how secondhand smoke might harm Juanito. What health effects concern you the most about secondhand smoke?
  - Turn to next page after discussing the question.

# What Are Health Effects of Secondhand Smoke?

**Children** being exposed to secondhand smoke could increase their chances of:



**Adults** being exposed to secondhand smoke could also increase their chances of:



# What Are Health Effects of Secondhand Smoke?

- ❖ People who smoke cigarettes are much more likely to develop—and die from—certain diseases. Some adult nonsmokers die because they breathed in secondhand smoke.
- ❖ Health problems in infants and children include more frequent and severe asthma attacks, respiratory infections, and ear infections.
- ❖ Babies whose mothers smoked during pregnancy and babies who are exposed to secondhand smoke after birth are more likely to die of sudden infant death syndrome.
- ❖ Some health conditions in adults include coronary heart disease, heart attack, stroke, and cancer in the lungs and other organs.



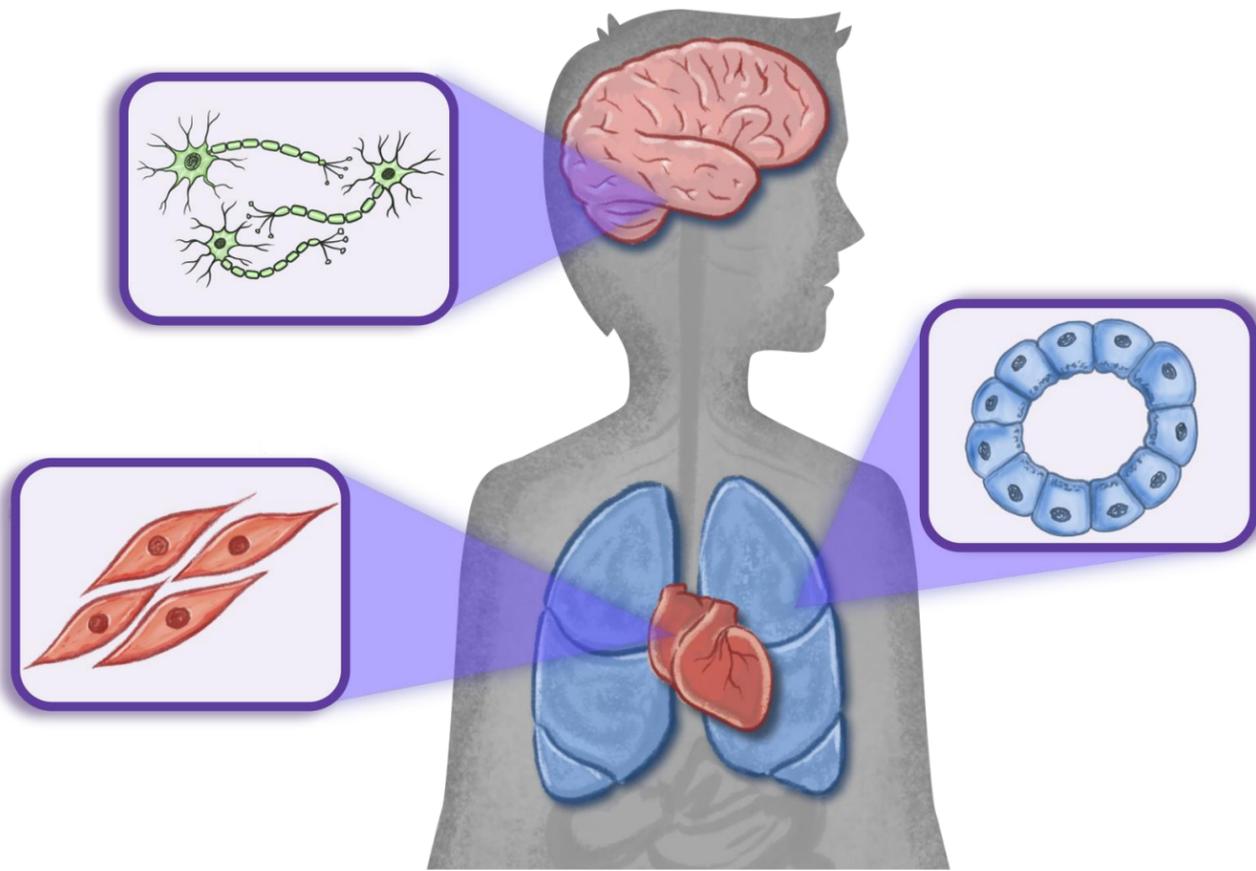
# What Is a Cell?

## Transitional question

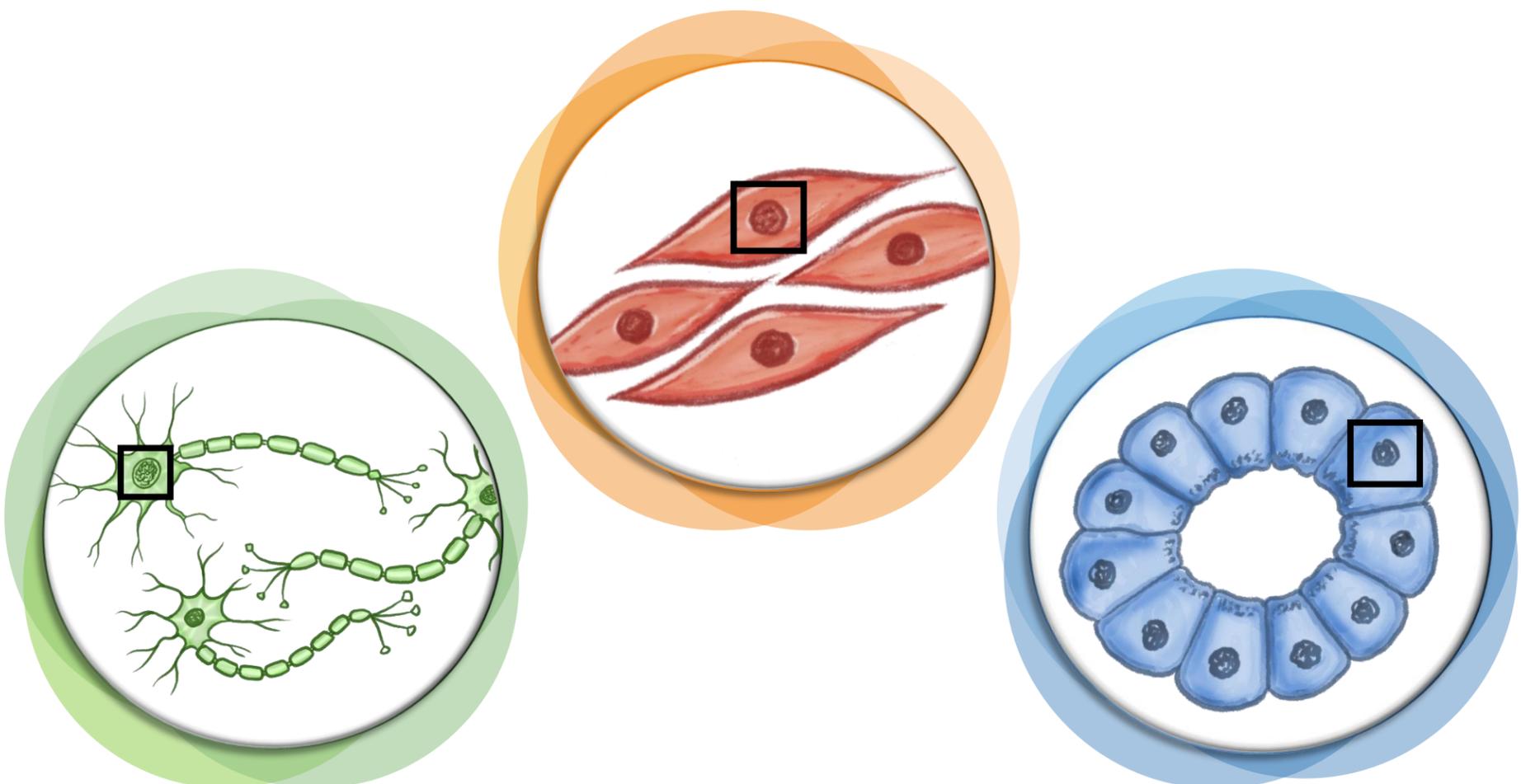
- Carolina showed Carlos a video during the story. What did Carlos learn about cells?
  - Turn to next page after discussing the question.

# What Is a Cell?

**Cells** are small structures that make up our bodies. Bodies are made up of many different types of cells.



Most cells contain a **nucleus**. The nucleus contains all of our genetic information in the **DNA**.



# What Is a Cell?

- ❖ Cells are small structures that make up our bodies. All people are made up of different types of cells like the heart, lung, and brain.
  - *Point to the different types of cells that make up the organs.*
- ❖ The cells that make up different parts of the body look different from each other.
- ❖ Most cells contain a nucleus. The nucleus contains all of our genetic information in the form of our DNA.
  - *Point to the nucleus in each cell.*



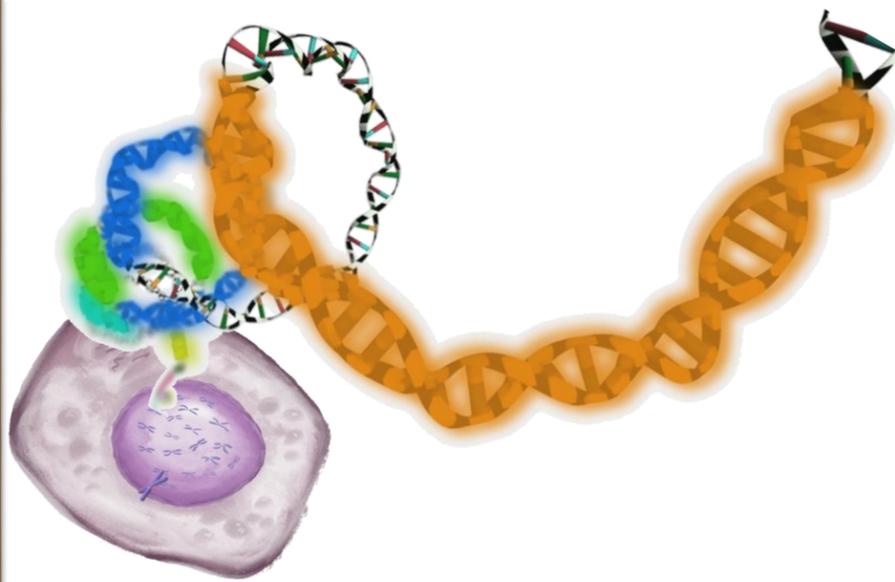
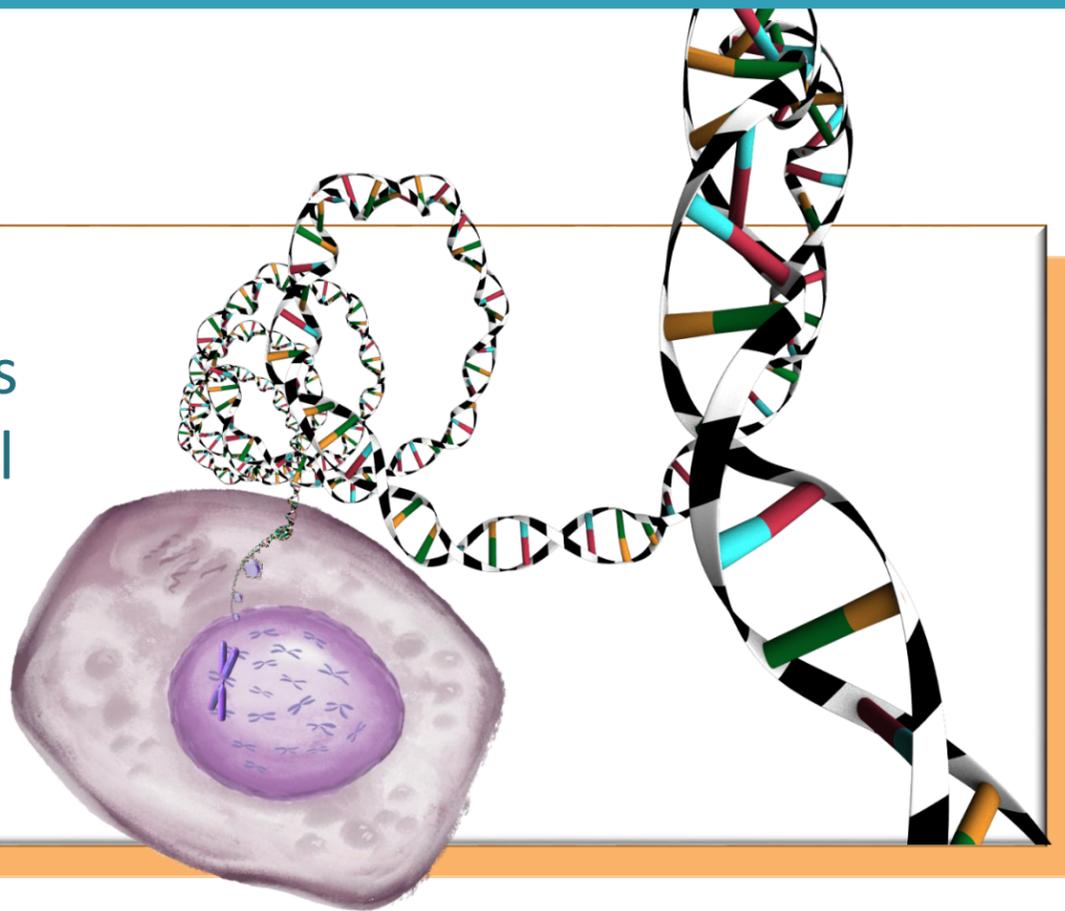
# Activity

## Microscope Activity

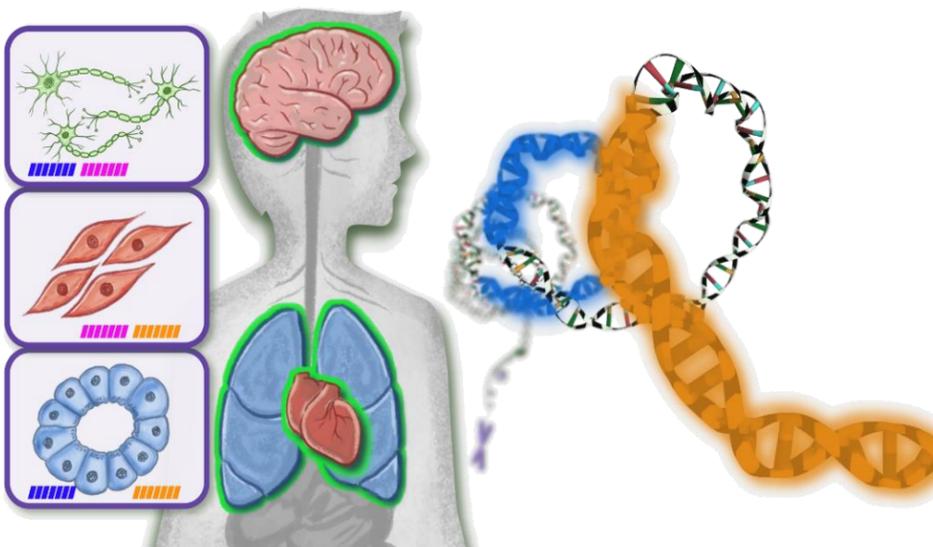
- ❖ Begin by mounting the cheek cell slide. Identify a good view of cells with the microscope.
  - ❖ Show the participants the cells through the tablet.
  - ❖ Explain that they are looking at a cluster of cells from inside the cheek.
  - ❖ Ask participants to point out a single cell. If they cannot point out a single cell, point one out again. Explain that they are looking at a cluster of cells. Ask participants again to point out a single cell (not the one you pointed out).
  - ❖ Then, ask participants to point out the nucleus in the cell they identified.
  - ❖ Encourage participants to ask questions.
- 
- ❖ Repeat all previous steps for nerve cell slide.

# DNA, Genes, and Me

Inside every cell's nucleus are small chains of **DNA**.



Some parts of the DNA form **genes**.  
*Each* human cell has about 25,000 genes.



**Genes** are sets of instructions that tell the body how to function.

# DNA, Genes, and Me

- ❖ Inside every cell's nucleus are small chains of DNA.
- ❖ Some parts of the DNA form genes. Each human cell has about 25,000 genes.
- ❖ Genes are sets of instructions that tell the body how to function.

## Activity

1. Use the DNA model to explain to participants what a very small piece of DNA looks like.
  - ❖ Allow participants to hold the model and to ask questions.
2. Ask participants how many colors they see in the middle section of the DNA.
  - ❖ Participants should say they see 4 different colors.
3. Explain: The small parts in DNA are called bases. Each color represents a specific base. There are just four types of bases in DNA.



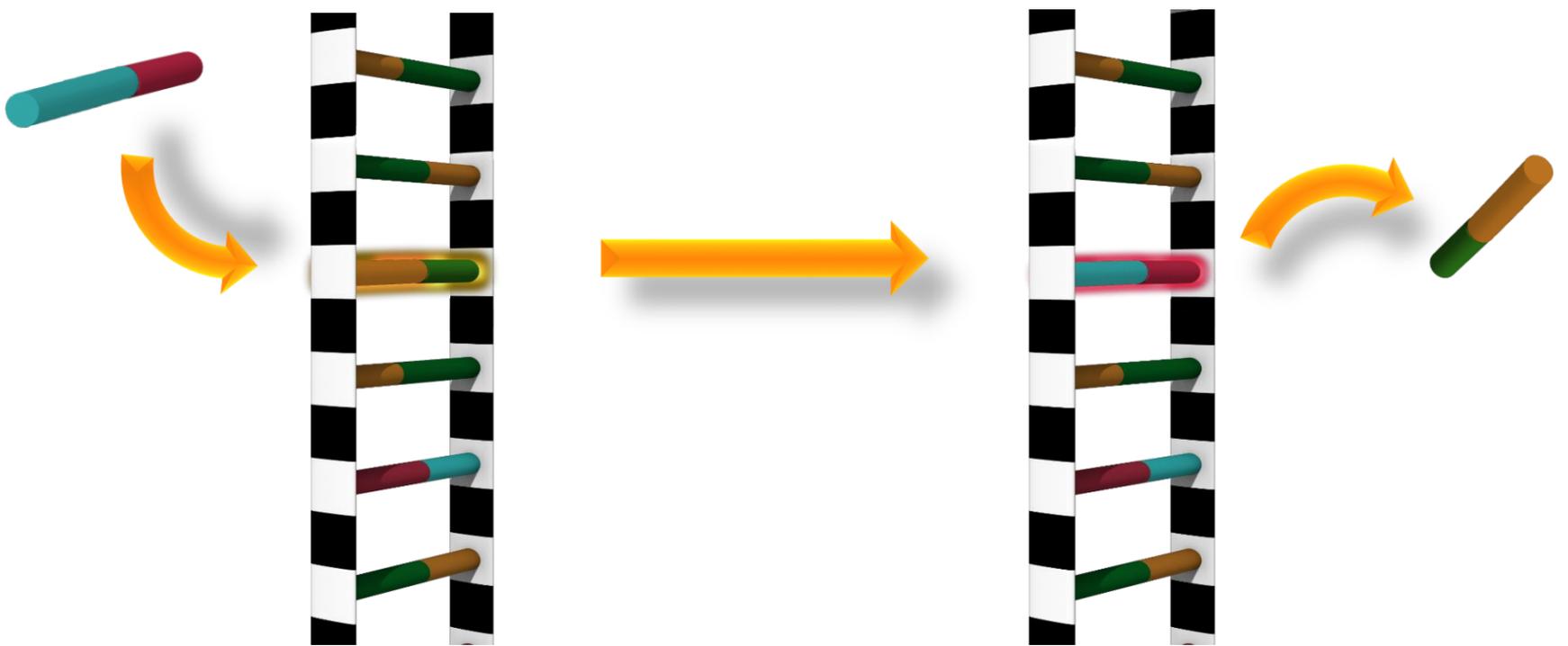
# How Can Secondhand Smoke and Residues Lead to Cancer?

## Transitional statement

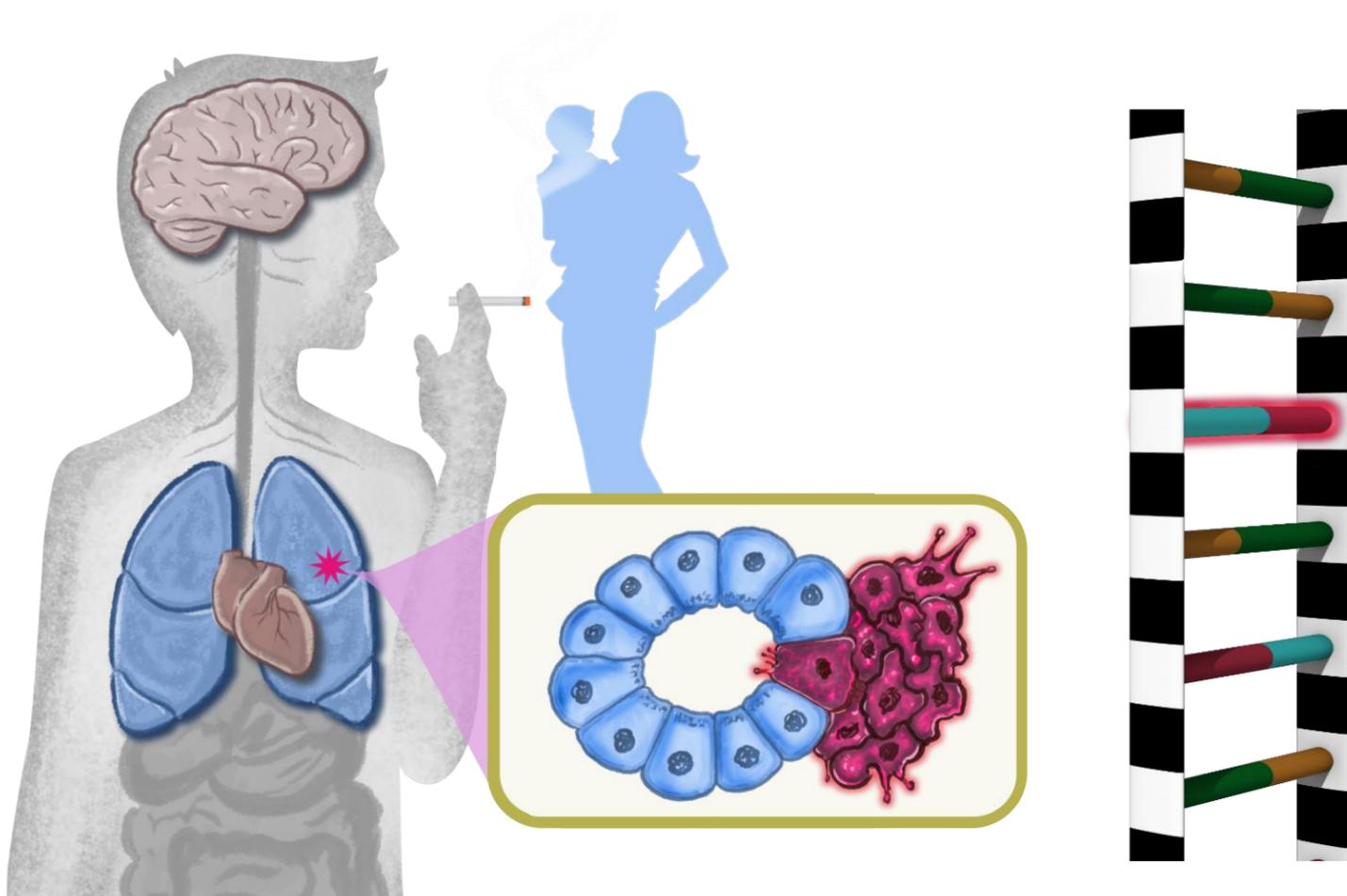
- The video that Carolina played for Carlos showed how exposure to secondhand smoke or smoke residues could lead to health issues such as cancer. Let us look at the information more slowly.
  - Turn to next page after discussing the question.

# How Can Secondhand Smoke and Residues Lead to Cancer?

## Mutations



A **mutation** is a change in a part of a gene.



Some of the chemicals in secondhand smoke can cause mutations.

Some mutations can lead to lung cancer.

# How Can Secondhand Smoke and Residues Lead to Cancer?

- ❖ Genes are codes that provide the instructions for everything the cell does.
- ❖ Genes usually do not change.
- ❖ A mutation is a change in a part of a gene.
- ❖ Mutations can occur naturally but are more common when the cells are exposed to certain chemicals (like those found in cigarettes).
- ❖ Often, mutations do not cause a problem, but sometimes they can lead to diseases, such as cancer.

## Activity

Use the DNA model to show the participants a visual representation of a mutation.

- ❖ Ask participants to remove the DNA segment that is attached with velcro.
- ❖ Give the participants the different piece. Point out that it has different colors.
- ❖ Ask participants to attach the new piece into the model. Explain that this small change in the DNA chain is a mutation. Mutations can change the cell's instructions. This change may lead to cancer.



# What Can I Do to Protect My Family?

## Transitional question

- During the video, Carolina and Jorge were concerned about Juanito being exposed to Carlos' smoke. What did Jorge and Carolina do to protect their family from secondhand smoke?
  - Turn to next page after discussing the question.

# What Can I Do to Protect My Family?



No smoking anywhere in or near your home.



No smoking in your car, even with the window down.  
Make sure places that you go to are tobacco-free.

# What Can I Do to Protect My Family?

- ❖ Do not allow anyone to smoke anywhere in or near your home. You may need to practice how you can speak to people you love or respect.
- ❖ Do not allow anyone to smoke in your car, even with the window down.
- ❖ Make sure that the places you go to are tobacco-free. Places could include your children's day care centers, babysitter's home, and schools.
- ❖ If your state still allows smoking in public areas, look for restaurants and other places that do not allow smoking. "No-smoking sections" do not protect you and your family from secondhand smoke, since smoke can travel and may not be seen. NC passed a law 2010 banning smoking in restaurants and bars.

**Developed by:**

**Joanne C. Sandberg, PhD<sup>1</sup>**

**Grisel Trejo, MPH<sup>1</sup>**

**Timothy D. Howard<sup>1</sup>**

**Sara A. Quandt, PhD<sup>1</sup>**

**Thomas A. Arcury, PhD<sup>1</sup>**

**DaKysha Moore, PhD<sup>2</sup>**

1, Wake Forest School of Medicine  
Winston-Salem, NC 27157

2, John R. and Kathy R. Hairston College of Health and Human Sciences  
North Carolina Agricultural and Technical State University  
Greensboro, NC 27411

**This material is based upon work supported by the National Science Foundation  
under Grant No. 1612616**

**Any opinions, findings, and conclusions or recommendations expressed in this  
material are those of the authors and do not necessarily reflect the views of the  
National Science Foundation.**

**For information contact:**

**Joanne C. Sandberg, PhD  
Wake Forest School of Medicine  
Medical Center Boulevard  
Winston-Salem, NC 27157  
336-716-4308  
jsandber@wakehealth.edu**

**Copyright 2021  
Wake Forest School of Medicine**

**Suggested citation:** Sandberg JC, Trejo G, Howard T, Quandt SA, Arcury TA, Moore D. Nuestra Familia Sana: Lay Educator Program. Environmental and Genomics Education Program Lesson 1 Flipchart. Winston-Salem, NC: Wake Forest School of Medicine, 2021.