

Protecting Our Lungs – Student Instructions



Create a Lung Model

Tools of the Trade

Your model will give viewers an idea of how the respiratory system works. When you breathe, your diaphragm, a muscle at the bottom of the chest cavity, moves down to create space. Air travels through the nose or mouth down the windpipe and into your lungs. Your lungs remove oxygen from the air and send it into your bloodstream. Your model will need several components:

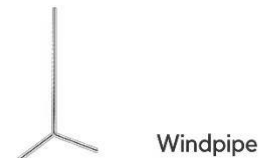
- **Windpipe- 2 bendable plastic straws**
- **Lungs- 2 small balloons**
- **Chest cavity- 1 plastic bottle, 16oz or 20oz**
- **Diaphragm- 1 large balloon**

You will also need the following:

- **Scissors**
- **Tape**
- **Clay**

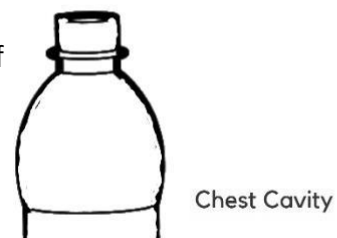
Prepare the Windpipe and Lungs

1. Cut one of the straws at the bend. Discard the longer piece.
2. Cut a small slit at the bend of the second straw. Insert the short piece of the first straw into the slit of the second straw. The two straws together should form the shape of a Y.
3. Use glue, tape, or clay to seal the space where the straws connect so that no air can escape.
4. Attach one small balloon to each straw.



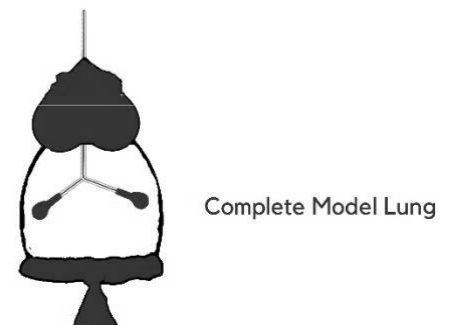
Prepare the Chest Cavity and Diaphragm

5. Cut the plastic bottle in half. Discard the bottom half.
6. Place the windpipe and lungs inside the chest cavity (top half of the bottle). The windpipe should stick out of the top of the bottle.
7. Secure the windpipe by molding the clay around the top of the bottle so that the space around the straw is closed. Make sure you do not crush the straw.
8. Cut the top of the large balloon and tie a knot in the neck.
9. Stretch the large balloon around the end of the bottle.



Complete and Test the Model Lung

10. Pull down on the diaphragm (the knotted end of the large balloon). The lungs should inflate.
11. If the lungs do not inflate, check your clay to make sure the top is completely sealed and try again.





Conduct a Vaping Demonstration

Tools of the Trade

In your demonstration, you will show how **e-cigarette** aerosols enter the lungs. Using an eyedropper, place 3-4 drops of cooking oil into the top of the straw. Then pull down on the diaphragm to spread the oil into the lungs. The oil will build up in the lungs and will not come out. This shows how vitamin E acetate is found in the lung fluid of people with **e-cigarette**, or **vaping**, product use-associated lung injury (EVALI).

For your demonstration, you will need the following:

- Your Lung Model
- Cooking Oil- the oil serves as vitamin E acetate, which is a harmful substance found in **e-cigarette** aerosol
- Eye Dropper- the eye dropper serves as the **e-cigarette**
- Recording Device- this can be a web camera or a cell phone
- Pen and Paper

Write Your Script

Before you record your demonstration, write a script to make sure you include all the important information about the dangers of **vaping**. Your script should include several parts:

- A short explanation about your lung model and explanation of each part of your model.
- Talking points for your demonstration of the working lung model.
- A short explanation about what the cooking oil and eye dropper represent.
- Talking points for your demonstration of vaping using the cooking oil, eye dropper, and lung model.

Using the space on your student handout, **draft a short script for your demonstration.**

Sketch Your Storyboard

A storyboard is a set of sketches that show how a story will be filmed. Think about each part of your script. What will it look like to the viewer? Using the boxes on your student handout, **create a small sketch for each part of your demonstration.**

Record Your Demonstration

Now that your script and storyboard are complete, you can record your demonstration. Before you begin, practice your script a couple of times so you feel comfortable. Once you are finished recording, review your demonstration with your family and friends. You may find things you want to change. That is okay! Re-record until you are comfortable with the final product.



Share Your Findings

The David J. Sencer CDC Museum uses award-winning exhibits and innovative programming to educate visitors about the value of public health and presents the rich heritage and vast accomplishments of CDC. Your demonstration could be a valuable contribution! Share your demonstration with the CDC Museum on Instagram using **@CDCmuseum**.

As the lead federal agency for comprehensive tobacco prevention and control, CDC uses their Tobacco Free Twitter and Facebook pages to protect the public's health from the harmful effects of tobacco use. You can contribute to their efforts by posting your demonstration to Twitter or Facebook using **@CDCTobaccoFree**.