

Healthy versus Unhealthy Lung



Science
Film
Festival

Knowledge
Through
Entertainment

FILM

2' Life Changing minutes - Why Do You Have to Interfere with My Pleasure of Smoking?

KEY OBJECTIVES

- 1 **To understand how smoking affects the different parts of the lungs**
- 2 **To understand the difference between a health and an unhealthy lung**
- 3 **To learn about the different parts of the lung model**
- 4 **To understand how breathing works**

INTRODUCTION

Cigarette smoke contains many chemicals that harm your respiratory system. These chemicals inflame the lungs and can lead to the overproduction of mucus. Because of this, smokers are at an increased risk for smoker's cough, bronchitis, and infectious diseases such as pneumonia. This inflammation can also trigger asthma attacks in people with asthma.

Nicotine in tobacco also paralyzes the cilia. Normally, cilia clean out chemicals, dust, and dirt through well-coordinated sweeping movements. When cilia are inactive, toxic substances can accumulate. This can result in lung congestion and a smoker's cough.

Both tobacco and the chemicals found in cigarettes change the cellular structure of lungs. The elastic walls within the airways break down. This means that there's less functioning surface area in the lungs.

In order to effectively exchange the air that we breathe, which is rich in oxygen, with the air that we exhale, which is filled with carbon dioxide, we need a large surface area.

When lung tissues break down, they aren't able to take part in this exchange. Eventually, this leads to a condition known as emphysema. This condition is characterized by shortness of breath.

TOPICS

Heath Biology

KEYWORDS

Bronchitis bronchi inflate

diaphragm oxygen carbon dioxide

LEVEL

Primary School Secondary School

RESOURCE TYPE

Project

INTENDED AUDIENCE SIZE

Small group

MODE OF DELIVERY

Live

TIME FOR ACTIVITY

30 min.

Healthy versus Unhealthy Lung



Science
Film
Festival

Knowledge
Through
Entertainment

Many smokers will develop emphysema. The number of cigarettes you smoke and other lifestyle factors may influence how much damage is done. If you're diagnosed with either emphysema or chronic bronchitis, you're said to have chronic obstructive pulmonary disease (COPD). Both disorders are types of COPD.

GUIDING QUESTIONS

- What is the difference between a healthy and an unhealthy lung?
- What are the different parts of the setup?
- What happens to the "lungs" when you tug on the balloon at the bottom of the bottle?

MATERIALS/PREPARATION

- Duct tape
- 4 balloons
- 2 straws
- 1 clear plastic bottle
- Scissors

TASKS/PROCEDURE

- 1 Cut the bottom off of the clear plastic bottle.
- 2 For the healthy "lung", tape one balloon end tightly around a straw so there were no air leaks.
- 3 For the "lung" affected by smoking you will actually need to put a balloon inside of another balloon and then duct tape it to a straw. This represents how smoking damages the elasticity of the alveoli tissue.

4 Once you have inserted the two straws with attached "lungs" into the bottle opening you will need to take a small lump of clay and connect/seal the straws to the bottle opening. Make sure to seal them tightly so there are no air holes. To further help the visual effect of an unhealthy lung you will also need to push some clay down inside the straw of the unhealthy "lung" to mimic the blockage that smoking can cause.

5 The last step in preparing your lung science experiment is to cut the bottom off a balloon, tie it off, and wrap the cut end around the bottom opening of your clear bottle. To prevent the balloon from popping you can simply add a layer of duct tape around the bottle to cover the sharp edges and then wrap your balloon around the bottom opening of the bottle. Once your balloon is set in place add one final layer of duct tape around the edges to help hold the balloon in place.

6 Tug on the bottom balloon piece and notice what happens to the "lungs".

FOSTERING DISCUSSIONS

When you tug on the bottom balloon piece you will immediately notice that the suction created inside the bottle will help the healthy "lung" to inflate more easily than the damaged "lung," which struggles to inflate properly.

Bronchitis is the swelling of the lining of the bronchial tubes. When the bronchioles are swollen, they become narrower, and less air flows to and from the lungs. Chronic inflammation of the bronchioles can cause mucus to build up in the lungs. Over time, the lining of the bronchial tubes thickens and airways eventually can become scarred.

AUTHORS AND SOURCES

Submitted by Discovery Centre Kenya