

Health

4.PCH.2.1

Identify the basic components and functions of the respiratory system.

Materials Needed:

- Internet access for websites
- KidsHealth link: Lungs and Respiratory System (5:20)
<https://kidshealth.org/en/kids/rsmovie.html>
- Lung and Respiratory System Quiz:
- Each group needs:
- 2-liter empty plastic bottle with cap
- 2 plastic drinking straws (available inexpensively at restaurant supply stores or donated by fast-food chains; do not use the flexible drinking straws)
- (2) 9-inch balloons
- 1 larger balloon (for example, for a punch ball)
- 2 rubber bands
- Appendix 1: Engineering directions
- Appendix 2: Assessment questions

Resources:

American Lung Association: <http://www.lung.org/your-lungs/how-lungs-work/>

Kids Health: <https://kidshealth.org/en/kids/lungs.html>

Image from Stanford Children's Health:

<https://www.stanfordchildrens.org/en/topic/default?id=anatomy-of-the-respiratory-system-in-children-90-P02950>

Focus:

Start class with a TRUE or FALSE activity to spark some interest. Designate one side of the room TRUE, one side, FALSE. As each of the following statements is read, ask students to move to the answer. You could record students' answers for each question as a Math extension.

Example: 10/ 20 or 50% of our class said #1 was False. Do not tell students the correct answer now. Answers are built into the lesson.

1. A person inhales and exhales about 22,000 times a day. TRUE
2. In 24 hours, you breathe enough air to fill about 30,000 Coke cans
3. Another name for the voice box is the Adam's apple. TRUE
4. Your lungs look like upside down trees. TRUE
5. Adult lungs weigh about 2 pounds. TRUE
6. Healthy lungs are spongy and bright red. (False-pink)
7. Yawning means you need more Oxygen. TRUE
8. Children breathe slower than adults. (False-faster)
9. The average sneeze is about 100 mph. TRUE
10. We lose about a ½ cup of water a day just by breathing. (False-1/2 Liter- about 2 cups)

Statement of Objectives:

Today, you will learn all the components or parts of the respiratory system and the job of each part. We are also going to create a lung model to help us learn about the respiratory system. Listen carefully and you will learn the answers to the questions I asked!

Teacher Input:

Play the video from Kids Health, Lung and Respiratory System
<https://kidshealth.org/en/kids/rsmovie.html>

At the end of the video ask for any questions. Have students use their laptops to respond to the quiz: <https://kidshealth.org/en/kids/rsquiz.html>

Assessment:

Guide students to build a lung model. The following information is from the website: Teach Engineering: Just Breathe. Give students Engineering Directions, Appendix 1
http://www.teachengineering.org/view_activity.php?url=collection/cub_/activities/cub_human/cub_human_lesson09_activity1.xml

After engineering the model, ask students to answer the questions on the Just Breathe handout. Appendix 2.

Closure:

Boys and Girls, thank you so much for your hard work today. You have learned all about the respiratory system and how it works.

FROM TEACH ENGINEERING:

Before the Activity

- Gather materials and make copies of the Lung Worksheet.
- Drill 2 holes (just big enough for a straw to fit through) in each of the caps of the 2-liter bottles. (Note: make sure to drill the holes far enough apart that the holes do not become one big hole!)
- Using a pair of scissors cut off the bottoms of each of the 2-liter bottles.

With the Students

1. Peel off the label, if any, on the 2-liter bottle.
2. Tell students that the 2-liter bottle represents the human chest cavity.
3. Stick the two straws through the two holes of the bottle cap.
4. Place one 9-inch balloon on the end of each straw, and secure them with rubber bands, as shown in Figure 2.
5. Tell students that the straws represent the bronchi and the balloons represent the lungs.
6. Stick the balloon ends of the straws through the bottle opening and screw the lid on tightly.
7. Stretch out the larger balloon and place it over the open bottom of the bottle.
8. Tell students that this larger balloon represents the diaphragm. They now have a finished model of the lungs (see Figure 3); now it's time to make the lungs work!
9. Pull the diaphragm (balloon) down (that is, away from the lungs) in order to inflate the lungs. (Note: This makes the chest cavity larger and decreases the pressure.)
10. Push the diaphragm (balloon) in (towards the lungs) in order to deflate the lungs. (Note: This makes the chest cavity smaller and increases the pressure.)

**JUST
BREATHE!**

After engineering your lung model, answer the following questions:

1. What happens when you inhale?

2. What happens when you exhale?

3. Why can some people hold their breath longer than others? Describe some activities, sports or hobbies where lung capacity influences success.

4. What exercises would improve your lung function?

5. What behaviors contribute to lung problems?

Credit: TeachEngineering.org