Classroom Teacher Preparation

Anatomy/Physiology 17: Artificial Lung

Please use the following to prepare for the next SfS lesson.

Description:

In this lesson, students are introduced to the structure and function of the human lungs through the use of models. Students are provided with a variety of building materials to construct an artificial lung and diaphragm model and examine how the lung and diaphragm work together to achieve breathing. An additional focus of the lesson is to introduce the field of bioengineering and demonstrate how engineers are currently developing the technology for construction of artificial lungs.

Lesson Objectives – SWBAT (“Students Will Be Able To…”):

6th-8th

- Describe how the respiratory system functions
- Model how the lungs and diaphragm work together during breathing
- Identify the design considerations a bioengineer must examine when developing an artificial lung

Disciplinary Core Idea (DCI)

LS1 From Molecules to Organisms: Structures and Processes – LS1.A Structure and Function

- (6th-8th) All living things are made up of cells. In organisms, cells work together to form tissues and organs that are specialized for particular body functions.

Science & Engineering Practice (SEP)

Developing and Using Models

Preparation:

This lesson is designed to be an introduction to the topic. No prior knowledge is necessary.

Room Set Up for Activities:

Students will work in small groups of 2-3 students. There are enough supplies for 10 groups.

Safety:

Students will be working with latex balloons. This lesson should not be selected if there is a latex allergy in the class or a latex restriction at the school.

Related Modules:

This lesson may be taught as part of a sequence or group of related modules on Human Anatomy. Modules include:

Anatomy/Physiology 1: Cell City – By competing to construct a model, students learn about its components and their functions. The metaphor of the cell as a city is used to make the information more accessible.
Anatomy/Physiology 10: Frog Dissection – Students dissect a preserved frog in order to observe the external and internal structures of frog anatomy.

Anatomy/Physiology 14: Eye Dissection – Students explore the anatomy of a preserved sheep eye with a review of mammalian eye anatomy and the basic mechanics of vision.

Anatomy/Physiology 18: The Mammalian Brain – Students examine preserved sheep brains to learn about the different structures of the brain, including cerebrum, cerebellum, and brainstem. Lobes of the brain and their functions are introduced.

For other module sequences and groups, look here: www.sciencefromscientists.org/sequences

Standards Covered:

Please click the following link to our website to review the standards covered by this lesson, listed by state: http://www.sciencefromscientists.org/standards/

Lessons are matched to both national NGSS and local state standards.

After Our Visit:

Extend this lesson by measuring the volume of air our lungs can hold.

Access this Extension activity by visiting the Classroom Post found on our website at sciencefromscientists.org/cohorts. Use the name of your school/cohort and password to log in.

To help Evaluate, check out our Open Response questions online at sciencefromscientists.org/open-response-questions. They are freely available for all of our lessons for current teachers. Use the password supplied by your instructor to log in.

Additional Resources:

- TED-Ed What do the lungs do? (3:21): https://www.youtube.com/watch?v=8NUxvJS-0k
- Respiratory System - The Dr. Binocs Show (3:52): https://www.youtube.com/watch?v=mOKmjYwfDGU
- Respiratory System Song (2:52): https://www.youtube.com/watch?v=LWWzXYWvn84