Human Anatomy - Circulatory and Respiratory Systems

Grade level: 6th - 8th
Lesson Time: 30 Minutes
Key Terms:
- Arteries
- Bronchi
- Capillaries
- Circulatory system
- Diaphragm
- Lungs
- Respiratory system
- Trachea
- Veins

Resources:
- Answer Key
- Circulatory and Respiratory System worksheet
- Circulatory System Card Activity

Materials needed:
- Red and blue string or yarn

Lesson Overview

The circulatory and respiratory systems work together to pump blood and oxygen through the human body. Without these systems, the human body could not provide oxygen to all of its cells. In this activity, students will take a tour of the circulatory and respiratory systems of the human body. They will explore how these two systems are related, the parts included in each, and how those parts are similar to other parts of the human body.

Objectives

- Identify the parts of the respiratory system, including the trachea, the lungs, and the bronchi
- Identify the parts of the circulatory system, including veins, arteries, and capillaries
- Explore and discover the ways in which the circulatory system interacts with the respiratory system

Standards (NGSS and Common Core)

For state specific standards visit edu.zspace.com

Next Generation Science Standards

- Life Science - From Molecules to Organisms: Structure and Processes
  - MS-LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

Common Core Connections

- Language Arts
  - WHST.6-8.1 Write arguments focused on discipline content.

Differentiation (Δ)

- Provide paper copies of diagrams to students to use as a reference
- Provide a handout with a list of vocabulary terms and definitions that will appear in the activity
- Enrichment: Students could research similar topics and create presentations
- Enrichment: Students could build a model of a key concept

Topic: Life Science - From Molecules to Organisms: Structure and Processes

Software: Studio

Introduction

The teacher will ask the students if they have ever considered what Earth would be like without water and air. Just as the Earth's systems work together to create clouds and rain, the human body's various systems work together to circulate blood and oxygen. The teacher will guide the students toward understanding that systems can work together to perform one main function. In this activity, students will use Studio to examine the circulatory and respiratory systems of the human body.

Activity

Human Anatomy - Circulatory and Respiratory Systems

This section will be completed in Studio along with the Circulatory and Respiratory Systems worksheet.

Scene 1

- How do the circulatory and respiratory systems work together?
- Use the Dissect stylus to remove the ribcage. Look at all the parts. Do you see how they connect?

Scene 2

- There is no muscle tissue in the lungs. What is the muscle that is underneath the lungs?
- Make observations about the trachea and the bronchi.

Scene 3

- Where are the veins and arteries going? Why are they very thin in some parts?
- The capillaries are not shown in this model. Identify where they would be.
- Use the Model Gallery to add the arm or leg.
- Dissect the arm or leg to look at the veins and arteries. How are the respiratory system and the circulatory system connected?

Closing

Students will complete the Circulatory System Card Activity to help them understand how the circulatory system connects. The students can do this in a pair or individually. Give the students a piece of red (oxygen-rich blood) and blue (oxygen-poor blood) string. The students will make a loop and then put all the cards in the correct place on the string. After the students complete the Circulatory System Card Activity, the teacher will lead a discussion to help the students identify the capillaries. Students can put a hole in the cards and have the "blood flow" through the cards.

Topic: Life Science - From Molecules to Organisms: Structure and Processes

Software: Studio

Questions for Discussion

1. What did you notice while doing this card activity?

   Answers will vary. Sample Answer: I noticed that an arteries don't always carry oxygenated blood.

2. How do the circulatory and respiratory systems work together?

   Answers will vary. Sample Answer: The respiratory system brings oxygen into the lungs. The circulatory system delivers the oxygen to all the cells in the body through the blood. The blood also takes the carbon dioxide that the cells don't want to the lungs where it is exhaled.

Δ Investigate Further

Extension Activity: The students could create a physical model of the circulatory and respiratory systems, including how they connect and how they work together.

Answer Key

1. Where do you see these systems connecting?

   Answers will vary. Sample Answer: The lungs are a point where the circulatory and respiratory systems connect.

2. What is the muscle that is underneath the lungs? Why is it there?

   Answers will vary. Sample Answer: The diaphragm is underneath the lungs. The movement of the diaphragm allows the air to move in and out of the lungs.

3. Make observations about the trachea and the bronchi.

   Answers will vary. Sample Answer: The trachea and bronchi are connected. The trachea is a larger tube that extends up to the mouth, while the bronchi have "roots" which are located inside the lungs.

4. Where are the veins and arteries going?

   Answers will vary. Sample Answer: The arteries carry blood from the heart to other parts throughout the body. The veins carry blood back to the heart.

5. The capillaries are not shown in this model. Identify where they would be.

   Answers will vary. Sample Answer: Capillaries links arteries and veins.

Name_____ Date _____

Complete this worksheet along with the *Human Anatomy - Circulatory and Respiratory Systems* Studio tour.

Where do you see these systems connecting?
What is the muscle that is underneath the lungs? Why is it there?
Make observations about the trachea and the bronchi.
Where are the veins and arteries going?
The capillaries are not shown in this model. Identify where they would be.

Circulatory System Card Activity

Cut out these cards.
Put them in a loop that shows how the blood would flow through them!

	left atrium
right atrium	left ventricle
right ventricle	artery
artery	aorta
capillaries	capillaries
lungs	foot
vein	vein