

The Circulatory System

5E Lesson

The 5E model is a scientifically proven method to improve student engagement and learning in your classroom

- ✓ Engagement
- ✓ Exploration
- ✓ Explanation
- ✓ Elaborate
- ✓ Evaluate



Complete Teacher Instructions

Circulatory System 5E Lesson

Grades 8-11	Circulatory System	Ongoing
Lesson Objective: Students will: - Investigate, through inquiry and computer simulations, the structure of the circulatory system - Be able to draw and label the structural components of the circulatory system - Be able to describe disorders associated with the heart and blood vessels - Explain the structural and functional differences between arteries and veins - Connect their knowledge of the circulatory system to overall body function - Connect the role of the circulatory system to the digestive and respiratory systems		
Possible Student Misconceptions: - Air and food molecules are distributed through the body in specific blood vessels - Blood on the left side of the heart goes to the left side of the body - The blood in your veins is blue		
Materials: 1 device (smartphone, Chromebook, laptop, tablet, or computer) - A means of projecting a PowerPoint presentation - Internet access		
Teacher Notes: - All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click on the image and click Edit Hyperlink or something similar. - I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ - I don't believe in long lessons. If you feel your students are losing interest, stop the PowerPoint and give them a 5-minute break. If you'd like, I recommend my video collection here - http://www.teachwithferg.com are tons of brain-break videos to choose from all grouped by category.		

Circulatory System – 5E Lesson

Engagement Phase On a piece of paper, have your students answer the following questions. - How is the respiratory system (breathing/lungs) and digestive system (eating/digesting) directly connected to the circulatory system (heart/blood)? - What would happen to the respiratory and digestive systems if the circulatory system were removed? Create a class discussion around their answers. Answers: - Both respiratory and digestive systems taken in molecules from the outside (air – respiratory, food – digestive) and transport them to the cells via the circulatory system. - If the circulatory system was removed, the products of respiration and digestion couldn't reach their destination and the person would die.	Duration: 20-30 min Teacher Role – Facilitate learning and guide understanding Goals - Connect student experiences - Create interest - Ask questions - Understand the content of the lesson
Exploration Phase Exploration – Lab Station Activity - In groups of 2-3, have your students complete <i>Exploration – Lab Station Activity</i>. Once they're done, they will submit their passport to you. Teacher Notes: - The complete instructions for my Lab Station activity can be found in the <i>START HERE – Instructions</i> file.	Duration: 1 hour Teacher Role – Facilitate learning and guide understanding Goals - Students receive experience with - Students use analytical and creative thinking - Students make observations, record results, and make connections
Explanation Phase - The lesson can be found in the folder – “Explanation – Circulatory System” - The lesson is designed to be completed over three days - There are many embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson	Duration: 2-4 hours Teacher Role – Explain concepts by presenting material found in the presentation.

- Day 1 – Blood vessels - Day 2 – Blood - Day 3 – The Heart Teacher Notes: - All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click the image and select Edit Hyperlink or something similar. - I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ - I have also enclosed a .PDF version of both the teacher and student versions	Goals - Students develop understanding of the content - Observations and experiences are discussed and critiqued - Students develop vocabulary - Students are able to connect the content presented to previous experiences
Elaborate Phase There are two elaborate activities found in the folder - Elaborate - Your students will complete – <i>Elaborate - Scavenger Hunt Activity</i>. This activity will require your students to move beyond what was covered directly in the lessons and allow them to demonstrate why their learning is so applicable and important. Teacher Notes: - Students will work in groups of two or three - Each group will only require a single device (smartphone, tablet, Chromebook, laptop, etc.). 2) Have your students complete - <i>Elaborate - Heart Disease Reading</i> - There are many reading comprehension and extension questions that will allow your students to delve deep into heart disease while expanding their knowledge of the circulatory system - The reading includes 14 comprehension questions and answers Teacher Notes: - Students will work individually	Duration: 1 hour Teacher Role – Facilitate learning and keep students focused Goal Students use their newly obtained knowledge to propose solutions and extend their learning to new situations
Evaluate Phase Circulatory System Quiz Have your students complete - <i>Evaluate – Circulatory System - Quiz</i> Teacher Notes: - It's sometimes best to have the students peer evaluate - Placing students in small groups and having them exchange papers to mark will accomplish two things - Provide immediate feedback on the quiz they just completed - Significantly reduce your marking time - Peer evaluation is not needed, only suggested when appropriate	Duration: 45 - 60 min. Teacher Role – Distribute and collect evaluation Goal Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

A Complete Lesson

Erythrocytes (RBC)

- Transporters of
 - **Oxygen**
 - **Carbon Dioxide**
- RBC
 - Lack a nucleus
 - Contain hemoglobin
 - Disk-shaped
- RBC are produced in the bone marrow
- Lives for ~120 days
- Old RBC are destroyed in **liver and spleen**

- Informative and engaging
- Student copies with blanks
- Videos embedded right into your slideshow

Disorders (cont)

- Stroke

- Blood cannot reach the brain due to a blockage in its blood vessels or severe brain bleed.
- Brain cells die due to lack of oxygen
- Can lead to paralysis,
 - loss of ability to speak
 - death

Causes a Stroke?

Circulatory System

- Blood Flow Summary**
- Blood Vessels**
- The Blood**
- The Heart**

Engaging Activities including my Lab Station and Scavenger Hunt Activities

Device-Based Scavenger Hunt The Circulatory System



Includes

- 5 Unique Locations
- Online form submission
- Answer Key

Works on all smartphones, tablets, Chromebooks and laptops

- **100% Digital**
- Simulations
- Quizzes
- Videos
- Games
- Word Scramble
- and more



The Human Circulatory System - Lab Station Activity



7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

