



Human Body Systems

Virtual Learning

9-12th PLTW[®] HBS

PLTW[®] 4.3.1 The Heart of the Matter

April 20, 2020



Human Body Systems

9-12th PLTW[®] HBS

Lesson: April 20, 2020

Objective/Learning Target:

Students will be able to identify the basic structure of the heart as well as identify the major blood vessels that bring blood in and out of the heart's chambers. (*Reference: PLTW[®] 4.3.1 The Heart of the Matter*)



Let's Get Started/Warm Up Activities:

Before we start our lesson today, watch the following videos:

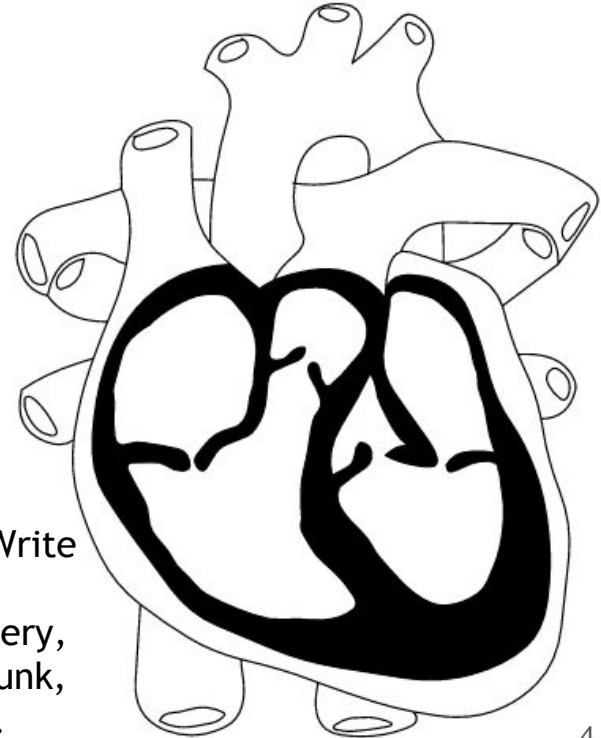
- [How the Heart Works](#)
- [Anatomy of the Heart](#)

Lesson/Activity:

Go to this website:
[The Anatomy of the Heart \(Interactive\)](#)

Activity #1:

1. Draw the heart diagram in your notebook or on a piece of paper.
2. Work through the interactive animation above by click “next” at the bottom of the animation.
3. Draw and label the following parts of the heart:
 - a. right atrium, left atrium, right ventricle, and left ventricle
 - b. Valves (4): tricuspid valve, pulmonary semilunar valve, aortic semilunar valve, and bicuspid (mitral) valve
 - c. How many cusps (flaps) does a tricuspid valve have? Bicuspid? Write the # by each term in your diagram.
 - d. Label the following: right pulmonary veins, right pulmonary artery, superior vena cava, aorta, left pulmonary artery, pulmonary trunk, left pulmonary veins, descending aorta, and inferior vena cava.





Lesson/Activity continued:

Go to this website:

[The Anatomy of the Heart \(Interactive\)](#)

Activity #2:

1. Find two different colors (pen, pencil, markers, crayons are all acceptable; pencil and pen would be considered two different colors). *Red and blue colors would be preferable but not necessary.
2. On the side of the paper by your heart diagram, use one color and write “deoxygenated blood.” Use the other color to write “oxygenated blood.”
3. Using the two different colors, use colored arrows to show the route that deoxygenated blood and oxygenated blood take through the heart. Use the animation link above for help.

Blood Flow Diagram Key	
	Deoxygenated blood
	Oxygenated blood



Lesson/Activity continued:

Go to this website:

[The Anatomy of the Heart \(Interactive\)](#)

Activity #3:

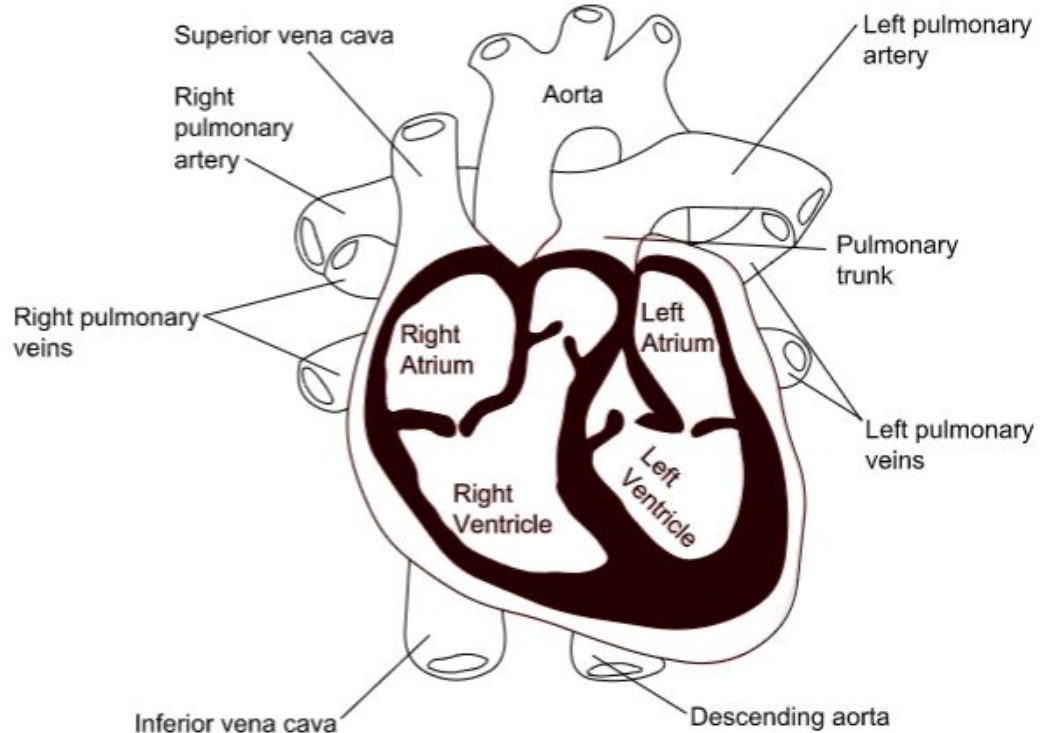
Under your heart diagram, answer the following questions on your piece of paper or in your notebook. Use the interactive link above as a reference.

1. What are the functions of the following?
 - a. A-V valves
 - b. Papillary muscles
 - c. Chordae tendineae

Lesson/Activity Answers:

Activity #1 Answer(s):

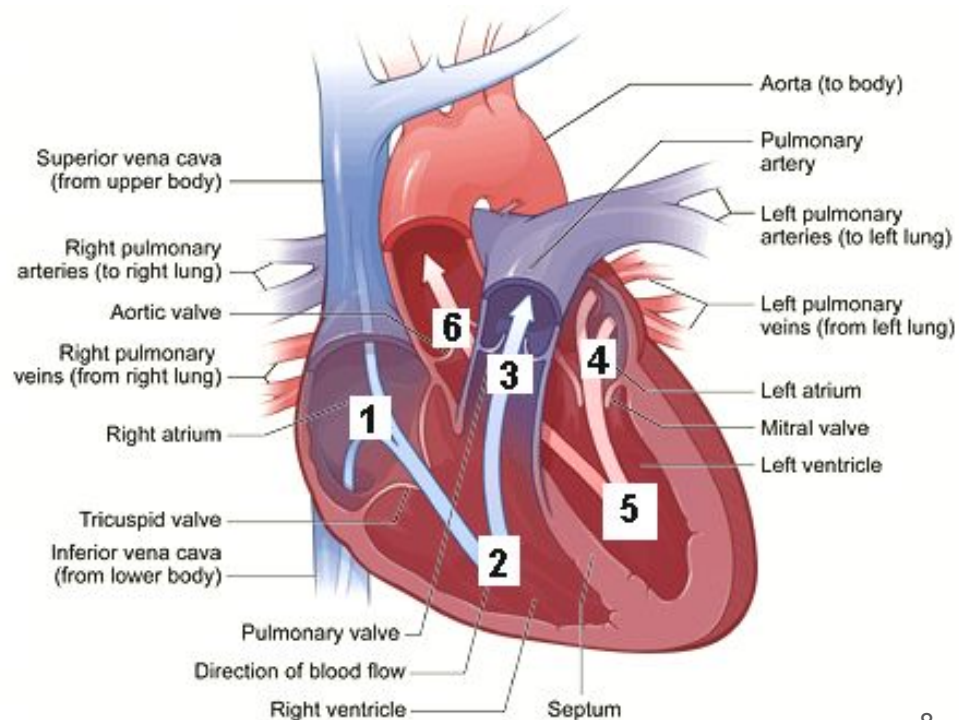
Click [HERE](#) or see the diagram on the right to check your heart anatomy diagram.



Lesson/Activity Answers:

Activity #2 Answer(s):

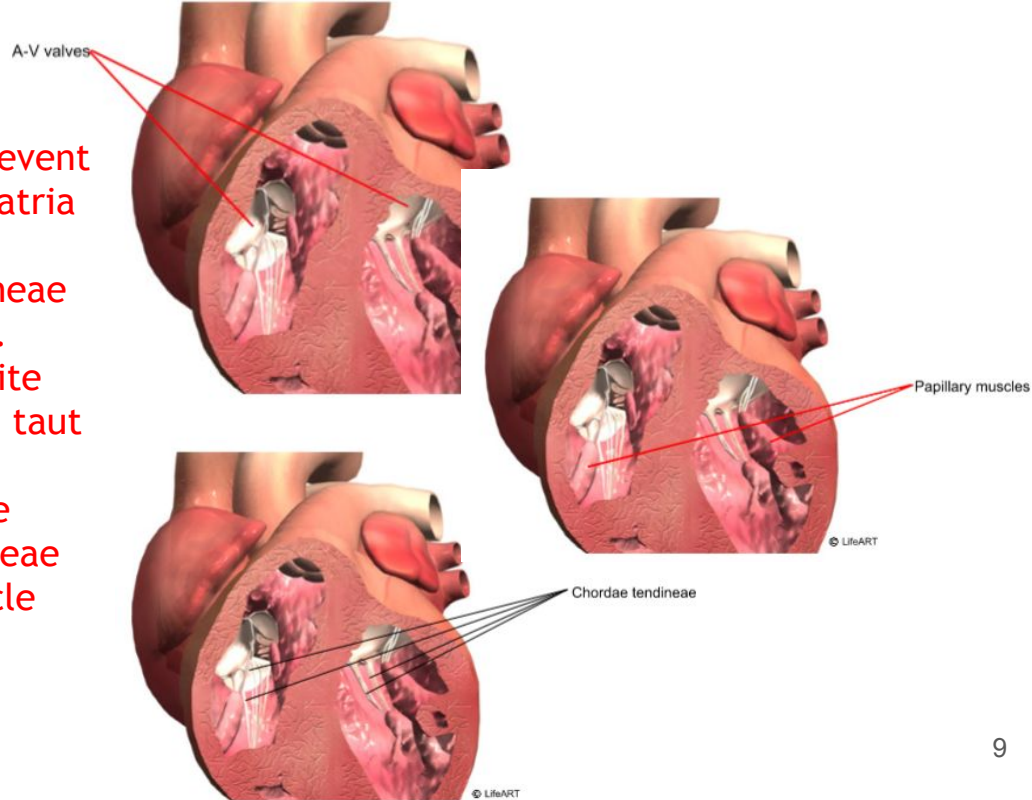
Deoxygenated blood comes from the superior and inferior VENA CAVAS, where it enters the RIGHT ATRIUM, (1), passes through the TRICUSPID VALVE to the RIGHT VENTRICLE, (2), passes through the PULMONIC VALVE, (3), to the PULMONARY ARTERIES, which takes it to the LUNGS, (where the blood is oxygenated); it then flows through the PULMONARY VEINS, enters the LEFT ATRIUM, (4), passes through the MITRAL VALVE to the LEFT VENTRICLE, (5), through the AORTIC VALVE and to the AORTA, (6), and then to the body.



Lesson/Activity Answers:

Activity #3 Answer(s):

1. What are the functions of the following?
 - a. A-V valves: **The A-V valves close to prevent any blood from flowing back into the atria when the ventricles are contracting.**
 - b. Papillary muscles: **The chordae tendineae are attached to the papillary muscles. When these muscles contract, the white string-like chordae tendineae become taut (tightly stretched).**
 - c. Chordae tendineae: **Together with the papillary muscles, the chordae tendineae keep the valves shut when the ventricle contracts.**



Practice:

Label the Heart:

Aorta

Right ventricle

Pulmonary vein

Vena cava

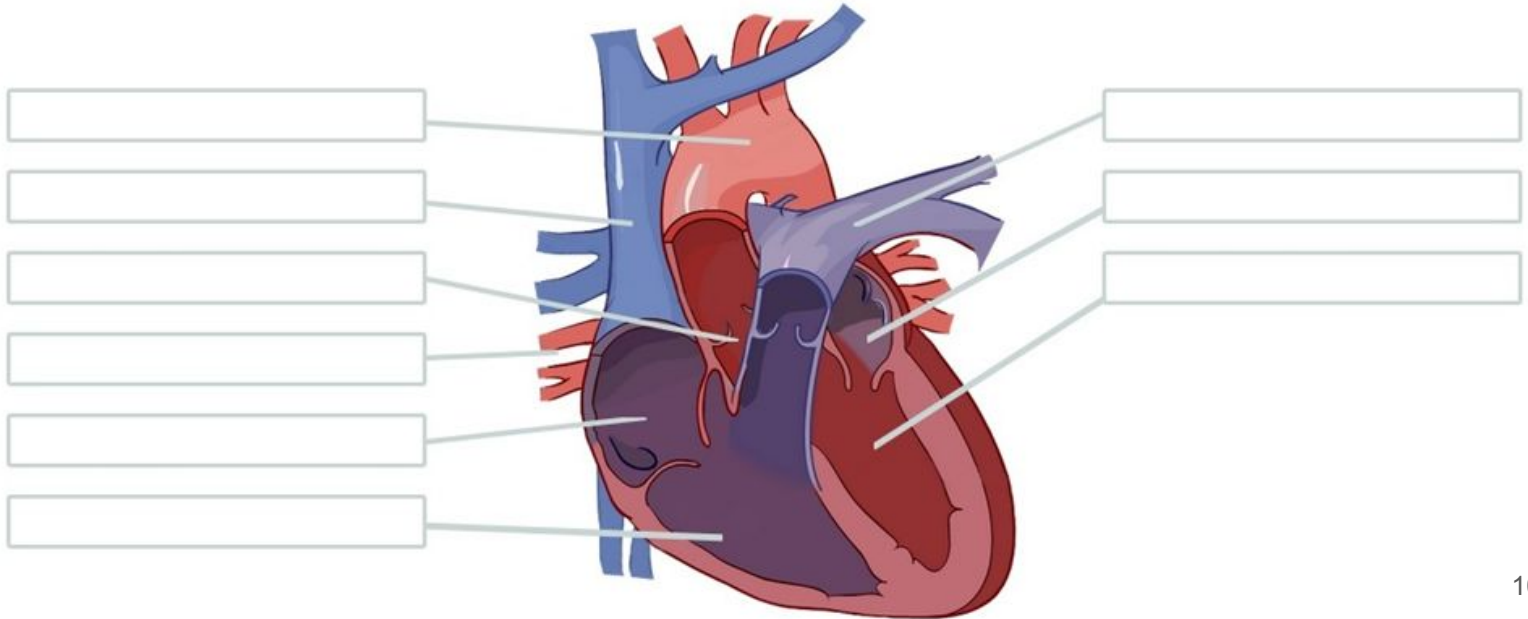
Semilunar valve

Left atrium

Left ventricle

Pulmonary artery

Right atrium



Practice Answer(s):

Vena cava

Aorta

Pulmonary vein

Left Ventricle

Semilunar Valve

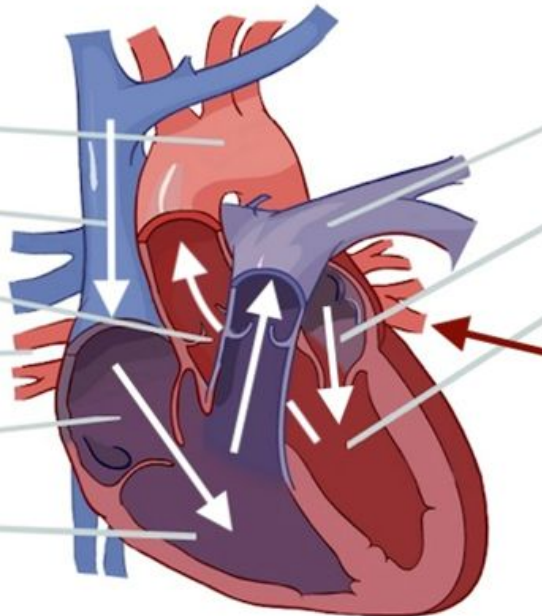
Right Ventricle

Right Atrium

Pulmonary Artery

Left Atrium

- Aorta
- Vena cava
- Semilunar Valve
- Pulmonary vein
- Right Atrium
- Right Ventricle



- Pulmonary Artery
- Left Atrium
- Left Ventricle



Additional Practice and/or Resources:

Learn More:

[HBS Unit 4.3.1 Flashcards](#)

Test your knowledge of heart anatomy by clicking on the link above.

[Quiz on the Blood Flow Through the Heart](#)

In order to understand the disease processes that affect the cardiac system, you must understand heart blood flow. This quiz will test your ability on how well you know the blood flow through the heart.

[Animation of a Beating Heart](#)

Check out this animated model of a beating heart. Shows the contraction of the ventricle three-dimensionally and graphically.