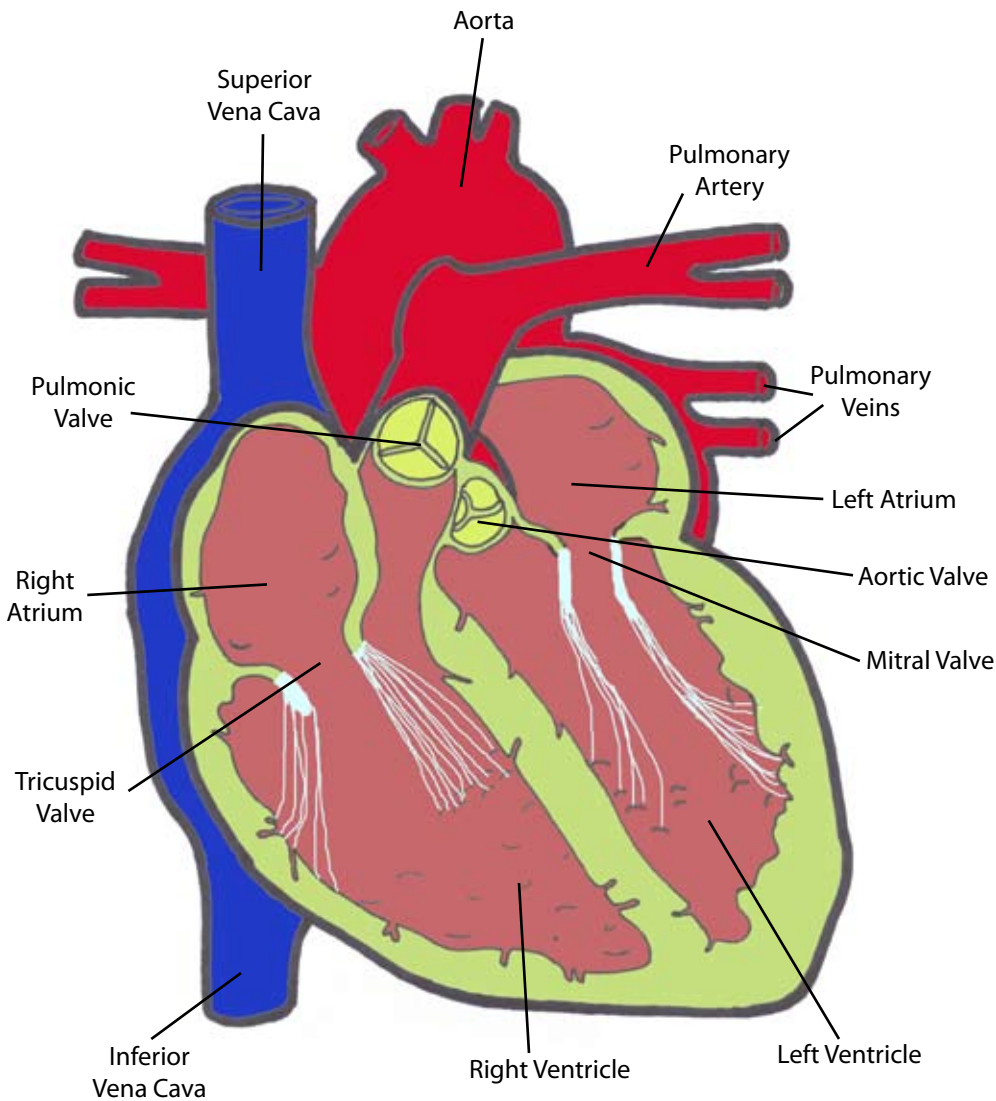


Beating Hearts

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Strong Bones

In the human heart, blood enters the **right atrium** through the **superior** and **inferior vena cavae**. Next blood passes through the **tricuspid valve** (or the right atrioventricular valve) and into the **right ventricle**. Then it passes through the **pulmonic valve** into the pulmonary trunk which branches to the right and left, forming the **pulmonary arteries**. These arteries lead to the lungs where the blood can pick up oxygen and get rid of carbon dioxide. Then the blood enters the **left atrium** through the **pulmonary veins**. The blood then passes through the **mitral valve** (or left atrioventricular valve) into the **left ventricle**. From here it passes through the **aortic valve** and into the **aorta**. The aorta brings the blood to the rest of the body.



MOST*

VOCABULARY

Aorta
Aortic valve
Left atrium
Left ventricle
Mitral valve
Pulmonary arteries
Pulmonic valve
Right atrium
Right ventricle
Superior and inferior Vena cavae
Tricuspid valve

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New York State Standards

Middle School

Standard 1:
Key Idea 1: 1.1a
Key idea 2: 2.3a

Standard 4:
Key idea 1: 1.2a, 1.2b, 1.2c, 1.2e

Standard 6:
Key idea 2: 2.1, 2.2, 2.3

Standard 7:
Key idea 1: 1.1, 1.3

Activity: Vampire Heart

MATERIALS NEEDED

Student Activity Sheet

Bags of play dough,
various colors

1 bag of pipe cleaners

Colored pencils, markers, or
crayons

Students should be able to:

Name the components of the
human heart and their function

A team of biologists that has been studying the anatomy and behavior of vampires for many years have just determined that if a vampire had a heart pumping blood throughout its body, then it would no longer require the blood of animals to survive. Without a heart, the blood a vampire consumes makes its way to the stomach and digestive organs but can never circulate throughout the body. With a heart in place, the vampire would be able to supply its entire body with its own blood, which will decrease its dependence on animal blood.

Since a vampire's body has gone through many changes due to the vampiric venom that was released into its blood stream, the anatomy of the circulatory system is quite different and more complicated than the circulatory system found in humans. One major change is this venom has fused the two lungs into one, making it impossible for the heart to receive oxygen, thus forcing the vampire to consume animal blood.

The biologists have determined all of the necessary structures this heart should include but have not been able to design it successfully. Your task is to design a fully functional artificial heart that can be implanted into a vampire's chest. Once the heart is designed, you must explain how blood enters the heart, how it receives oxygen, and how it is pumped back to the rest of the body. Since this type of heart has never been designed before, it is your duty to come up with the terminology to describe all of the parts. Once your design is complete, make a labeled diagram of the heart, which includes all of your new terminology. You should also write a description of how blood flows through this unique heart.

The following structures should be included in your creation:

3 major veins entering the heart

1 lung

2 major arteries that go to the lungs

3 major veins that go from the lungs to the heart

3 chambers

5 valves

2 major arteries that bring blood to the body

With your pieces of play dough and pipe cleaners, make a cross-section of the vampires' heart so the insides and outside can be clearly viewed. The design must correspond to the vampire anatomy so refer back to the introduction for information about the vampires' heart. The heart should work mechanically and the valves should be placed in appropriate areas. Once you have inspected the design, draw and label your heart on the student worksheets provided. Once the drawing is finished write out the complete description of how the blood flows, use the description provided for the human heart as an example.

Activity: Vampire Heart

Name: _____

Date: _____

Draw your Vampire Heart in the space below. Make sure you label all of the structures with your unique names.

Write a description of how blood flows through your vampire heart. You may refer to the human heart description on page 1 for an example. Be sure to include all of the parts of the heart and their correct names. Use the back of this sheet if you need more space.
