Title: Take a Heart Hike!

Grade Ranges:
___K-4
___5-8
_X_9-12

Subject Tag:
Science: The Human Body

Synopsis:
Students will walk and talk through the systemic (heart/body) and pulmonary (heart/lung) blood pathways in order to understand how the heart and lungs work together to transport oxygen and carbon dioxide via the blood.

Keywords:
hands-on activity, kinesthetic learning, heart, circulatory system, cardiovascular system, blood, lungs, blood flow, blood vessels, anatomy, physiology

Body:
1. Prior to assigning this activity, have students read about the human circulatory (cardiovascular) and respiratory system and/or discuss the information in class. Students should be familiar with each circulatory organ (heart, blood vessels, and blood) and its role in the movement of oxygen and carbon dioxide. Students also need to understand how the lungs work and how gases can diffuse into and out of cells. A diagram of the each system would help students visually trace the flow of blood. This activity requires you to construct (on the floor) a two-dimensional diagram of a three-dimensional system. If textbook resources are limited but Internet resources are available, have students visit http://www.brainpop.com and pick the movie on the heart for a good (and funny) overview.

- Draw the diagram (Teacher Download, figure 1) with tape on the floor of your classroom.
- Label the chambers of the heart, the lungs, the body cells, and all blood vessels according to the diagram (Teacher Download, figure 1).
- Place a bowl of blue circle cut outs in the body cells and a bowl of red circle cut outs in the lungs.

2. To begin the activity, position a student (or several) in a standing position at a station along the route taped to the floor. Give him or her the appropriate color circle for where they are standing. For example, a student standing in the right atrium of the heart would be holding a blue circle.
3. Have students move along the route and describe to the group what they are doing at each stop — explaining to the group what route (blood vessel) they must take to reach the next stop. For instance, have students exchange red blood cells for blue blood cells at the body cells station and exchange blue blood cells for red blood cells at the lung station. The color change illustrates the diffusion of oxygen into or out of the blood (blood cells

carrying oxygen appear red and blood cells carrying carbon dioxide appear blue). Point out that blood vessels carrying blood away from the heart (arteries) usually carry red blood and blood vessels carrying blood towards the heart (veins) usually carry blue blood. The only exceptions to this color-coding are the pulmonary arteries and veins (see figure 1). Point out that the right side of the heart handles blue blood and the left side of the heart handles red blood.
4. After all students have had a chance to do the activity, assess their knowledge of blood flow structures and patterns with a written exercise (see Assessment Criteria).

Related Links:
Brain Pop; http://www.brainpop.com**;** (great general health, science, and technology resource for high school students. Have students pick the movie on the heart for a good (and funny) overview.)

Features:
__Contains special education tips
___Quick Activity (less than 30 minutes; story starter)
___Requires Internet access for students to complete

Objectives:
1. Students will be able to describe the sequence of blood flow from heart to lungs and back and from heart to body and back.
2. Students will be able to label the parts of the cardiovascular system and describe their respective functions.

Standards:
NY: Living Environment 4.1: Living things are both similar to and different from each other and from nonliving things.

NYC: Scientific Communication: S7d - The student demonstrates effective scientific communication by clearly describing aspects of the natural world using accurate data, graphs, or other appropriate media to convey depth of conceptual understanding in science; that is, the student: Explains a scientific concept or procedure to other students.

CT: 5: Students will understand the classification and physiology of the great diversity of organisms and identify relationships of structure and function.

NJ: 5.1: All Students Will Learn To Identify Systems Of Interacting Components And Understand How Their Interactions Combine To Produce The Overall Behavior Of The System.

Prerequisite Skills:
1. Students have a working knowledge of the parts of the circulatory and respiratory systems.
2. Students understand the concept of diffusion.
3. Students understand the role of blood cells in carrying oxygen or carbon dioxide.

4. Students have sequencing ability

Time Required:
Approximately 20 minutes for set-up and 45 minutes to conduct the lesson.

Technology and Materials Needed:
1. 3-inch-wide masking tape
2. Large magic marker to write on tape
3. Two small bowls or pans
4. 20 quarter-sized red circles and 20 quarter-sized blue circles

Assessment Criteria:
1. Write the steps of blood flow on the board and have students write them down in the proper order after the activity is complete.
2. Give students a list of parts of the cardiovascular system and have them describe the respective functions (or match structures and functions).

Recommended Lesson Plan Review Date:

Review Comments:
check Web site

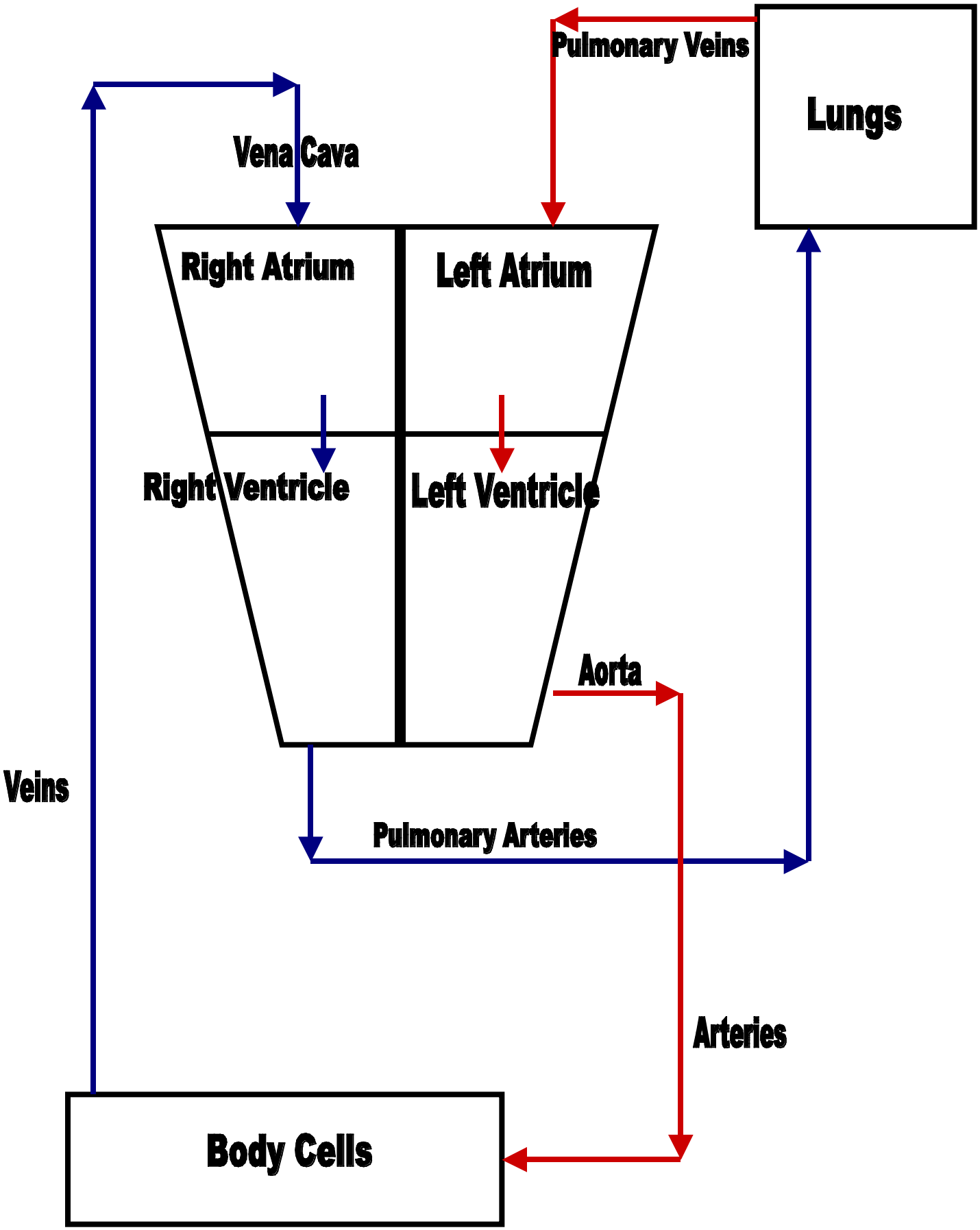

Figure1. Two Dimensional Blood Flow Diagram