

### Follow-up Discussion

The most important part of this segment is to examine both the facts and beliefs generated by the class in their "Everything We Know About..." list. Research indicates that students will retain their previous misconceptions — in preference to the new information — until they actively recognize and correct their own errors. Because of this, it is important to lead students to the correct ideas while identifying and correcting any misconceptions from the class list. After reviewing the list, encourage students to share the answers they got to the questions raised, before viewing the program.

Raising a thought-provoking question is a good way to assess the overall depth of student understanding. A couple of suggestions are listed below

- Why is it possible to donate blood?
- Why is our blood red? Is it always red?
- How is our blood like a delivery system?

### Follow-up Activities

- Teach students how to take pulse measurements and collect data for all students in the class. Graph and analyze the data for both resting pulse rates and pulse rates after two minutes of exercise.
- Invite a parent or someone from the community who is a doctor or nurse into the classroom. Have them share a model of the human heart and talk about how to keep your circulatory system healthy.
- Have students draw a picture of the heart, labeling the various parts, or provide them with materials to build a 3-D model of the human heart.

### Suggested Internet Resources

Periodically, Internet Resources are updated on our Web site at [www.LibraryVideo.com](http://www.LibraryVideo.com)

- [www.brainpop.com/health/circulatory/heart/index.weml](http://www.brainpop.com/health/circulatory/heart/index.weml)  
"Brain POP" is an educational health and science site that has movies and printable activity pages about the circulatory system and includes a heart quiz.
- [www.fi.edu/biosci/heart.html](http://www.fi.edu/biosci/heart.html)  
"The Heart: An Online Exploration" from The Franklin Institute science museum is an excellent site, containing images and movies about the heart, as well as lesson plans, extension activities and links to other resources.
- [kidshealth.org/kid/body/heart\\_SW.html](http://kidshealth.org/kid/body/heart_SW.html)  
The "KidsHealth" Website developed by the Nemours Foundation is an interactive journey through the human body.

### Suggested Print Resources

- Simon, Seymour. *The Heart: Our Circulatory System*. William Morrow & Co. 1996.
- Bampton, Claire. *Zoomers: Your Amazing Body*. Reader's Digest Publishing, New York, NY; 1996.
- Cromwell, Sharon. *Why Do My Feet Fall Asleep? And Other Questions About the Circulatory System*. Rigby Interactive Library, Crystal Lake, IL; 1998.

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## All About Blood & the Heart

Grades K-4

This guide is a supplement, designed for educators to use when presenting this program in an instructional setting.

**Before Viewing:** Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start of a new unit, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, after reviewing the pre-viewing discussion questions provided for your class, create an "Everything We Know About..." list. Preview key vocabulary words and have students raise additional questions they hope will be answered by this program. Most importantly, students should be told that as "science detectives" they must listen closely, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they put on their list were scientifically accurate.

**After Viewing:** After a brief discussion about the program, challenge your "science detectives" to prove or disprove the accuracy of the facts they put on their "Everything We Know About..." list. Discuss what else they learned and use the follow-up questions and activities to inspire further discussion. Encourage students to research the topic further with the Internet and reading resources provided.

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## Program Summary

The human body is composed of many different parts. The circulatory system contains the heart, the blood and many blood vessels, and is responsible for circulating the blood throughout the body, providing oxygen, water and food to cells. Circulating blood not only delivers materials that keep the body healthy, but also removes waste materials and helps fight disease. All body systems and all cells depend upon the circulation of blood for survival.

Our blood contains nutrient-rich plasma along with red cells, white cells and platelets. There are approximately four million red blood cells in a single drop of blood, each carrying oxygen from the lungs and heart to every cell in the body, and each eliminating waste on their return trip. The white blood cells seek to destroy any germs that may have entered the body. Platelets stick together, forming a screen that stops blood flow when we are cut. People can help save lives by donating blood to a blood bank where it is stored for those who need it. One of the jobs of the people who work at a blood bank is to find out what blood type a person has. There are four types of human blood (A, B, AB and O). When people receive blood, they must receive a blood type that matches their own.

The heart is a strong muscle that acts as a pump, pushing blood throughout our body. When the heart beats, it pushes blood out; when it rests, it fills up with blood again. This happens about 100,000 times each day! The heart has four sections called chambers. The two chambers on the right side pump the blood from the veins to the lungs, where the red cells pick up oxygen, which is needed throughout the body for energy. The chambers on the left side of the heart pump this oxygen-rich blood out to the body's trillions of cells through arteries. The chambers of the heart have special trapdoor-like valves to prevent blood from flowing backwards. The sounds that you hear when you listen to a heartbeat are the opening and closing of these valves.

There are three types of blood vessels: arteries, veins and capillaries. Arteries are the largest and strongest vessels, and they carry the oxygen-rich blood out from the left chambers of the heart to the body. Once the oxygen is delivered throughout the body, smaller vessels called veins carry the blood back to the heart where it gets sent to the lungs again to pick up more oxygen. Capillaries are the smallest blood vessels that connect arteries and veins and deliver oxygen to cells in the most distant parts of our body.

Just like every other part of your body, your circulatory system needs to be cared for. Exercise, plenty of rest and eating the right kinds of foods are all essential for good health. Cleaning cuts quickly and washing hands often are also helpful practices to keep most germs out of your body.

## Vocabulary

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the video.

**blood** — A living liquid that is pumped by the heart through the many miles of blood vessels in our body and provides our cells with oxygen, nourishment and protection against germs.

**blood vessels** — Tubes called arteries, veins and capillaries that carry the blood around the entire body.

**circulatory system** — The major body system that supplies the body with oxygen from the lungs, nutrients from the digestive system, and germ fighters. The circulatory system includes the blood, the heart and miles of blood vessels.

**cells** — The smallest building blocks of all living things. All living tissue is made up of cells.

**tissue** — A group of cells that have the same job. Different types of tissue join together to form organs; organs work together to form organ systems that make up the human body.

**organs** — The major parts of the body systems, such as the heart, lungs, kidneys and the brain.

**blood bank** — A place where blood is donated and stored until it is needed by someone who is sick or injured.

**centrifuge** — A machine that spins blood samples very quickly to separate out the blood into its different parts.

**plasma** — The clear, yellowish, watery liquid that carries the blood cells, making up more than half of our blood supply.

**red blood cells** — The cells in the blood that carry oxygen from the lungs to all the cells in the body, and eliminate waste on the return trip to the lungs. Oxygen makes blood red; otherwise it is a bluish color.

**white blood cells** — The cells in the blood that protect the body from invading germs. Once a germ enters the body, perhaps through a cut, white cells surround and destroy it.

**platelets** — Cell fragments found in blood that assist in blood clotting.

**heart** — The fist-sized muscular organ that pumps blood throughout the body.

**stethoscope** — A device used by doctors and nurses to listen to a heartbeat.

**chambers** — The four little rooms inside the heart.

**valves** — The trapdoors in the chambers of the heart and in veins that prevent blood from flowing backwards.

**arteries** — The largest and strongest of the blood vessels, which carry the red, oxygen-rich blood from the lungs away from the heart and out to the body.

*(Continued)*

**veins** — The vessels that carry bluish-colored blood back to the heart and lungs to drop off wastes and pick up more oxygen.

**pulse** — The movement we can hear and feel when blood is pushed through the arteries.

**capillaries** — The smallest blood vessels that connect arteries and veins, and allow the blood to reach all the body's cells.

## Pre-viewing Discussion

Before students generate their list of "Everything We Know About..." this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this show:

- How is the heart like a pump? What important job does it do?
- How does blood travel through your body? Why is it important?

After the class has completed their "Everything We Know About..." list, ask them what other questions they have that they hope will be answered during this program. Have students listen closely to learn if everything on their class list is accurate and to hear if any of their own questions are answered.

## Focus Questions

1. What does the word "circulate" mean?
2. What are the parts of the human circulatory system?
3. What are the main jobs that blood does for our body?
4. About how much blood is inside an infant? A ten-year old? An adult?
5. Why do people donate blood?
6. What is plasma? What does it look like? What does it do?
7. What are the jobs of the red blood cells?
8. What do white blood cells do?
9. What do platelets do? What is a scab?
10. What are blood types? Why is it important to match donated blood type with a patient's blood type?
11. Where is the heart located in your body? What does it do?
12. What are the different parts of the heart? What do they do?
13. What causes your pulse? What is a normal pulse rate?
14. How many times a day does your heart beat?
15. What do the heart's two right chambers do? The two left chambers?
16. What are valves? Why are they important?
17. What are several differences between arteries and veins?
18. What are capillaries?
19. What do you need in order to keep your heart healthy?