



HeartSmart Teachable Moments

# the powerful heart & the mighty brain

Grades 4 – 6



# The Powerful Heart & The Mighty Brain - Heart Facts

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## Summary

Students will:

- Identify the size and shape of their heart and simulate heart action
- List what they know and questions they have about their heart
- Take their pulse and locate their heart, veins and arteries on an outline drawing

## Objective

- Students will learn basic facts about the heart and the circulatory system

## Key Words

heart, blood, cell, circulatory system, blood vessel, valve, aorta, artery, vein, capillary, pulse, heart attack, oxygen, nutrient, muscle, waste

## Preparation

- Research online clips demonstrating the circulatory system in action through animations

## Potential Materials

- A soft tennis ball
- Writing and drawing materials

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## Main Steps

Choose activities from the following steps to customize your lesson to the needs of your class.

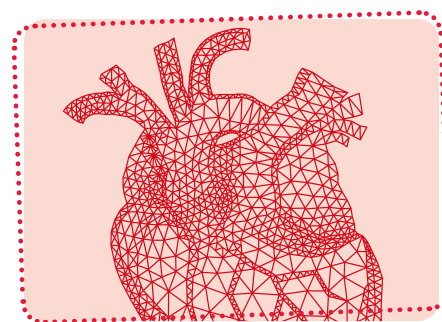
## HEART FACTS

### What Do You Know?

Write out the key words on to a piece of chart paper or a white board with the word “heart” in the centre. Review the new vocabulary and have students who know the words help explain them to others. Ask the class what facts they know about the heart and how it works and write their facts on chart paper

Have the class brainstorm questions they have about the heart and heart health and write the questions on chart paper. Ensure that there are enough questions that groups of students will be able to research two or more each. If necessary, prompt students with questions such as the following:

- ★ Where is the heart located?
- ★ What is a heart beat?
- ★ What does the heart do in your body?
- ★ Why does the heart beat fast sometimes and slow sometimes?
- ★ What can kids do to keep their heart healthy?
- ★ How can you help your heart beat strongly through your whole life?



Discuss additional facts about the heart:

- Ask students to identify the size and shape of a human heart. Have them make the real shape and approximate size of their own heart by making a fist and cupping their other hand around it.
- Ask the class if they know what the heart does and explain that it pumps continuously to move blood through the body.
- Have students squeeze an old tennis ball to see how hard the heart has to work when it beats. (Younger students may have to use two hands.) Ask students to see how many times they can squeeze a tennis ball in a minute.
- Explain that their hearts beat 60 -100 times a minute, without stopping.

## The Powerful Heart & The Mighty Brain - The Circulatory System

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- Have students find their pulse by pressing two fingers against the side of their windpipe under their jaw. Have them count their pulse for 15 seconds and multiply it by four to find the number of times their heart beats in a minute.

Explain that young people can make many choices that affect their heart health, such as healthy snacks, active living and living smoke-free.

### THE CIRCULATORY SYSTEM

Distribute the activity sheet “*The Circulatory System*” and have them form groups of three or four.

- Explain that in this activity students will learn real facts about the heart and how it works.
- Review the meanings of the vocabulary with the class and make a class glossary of unfamiliar words. Explain that students will learn more about the words in the following activities.
- After they have reviewed the circulatory system have students test their knowledge by working in groups to complete the activity sheet “*Blood Flow and Sequence*.” *Tip: Put a piece of paper over the answers when making copies.*

Assign one or more questions from the class question chart to each group and have them answer if they can using their activity sheets or further research. Have the groups share their answers with the whole class. Write the answers students found on the chart paper, note the questions they still have not answered, and add any additional questions they now have.

### Wrap-up/Assessment

Refer to the chart of class questions and ask students to summarize the main points they have learned about the heart and circulatory system. They should be able to state that:

- The heart acts as a pump to circulate blood through the body.
- You can feel your heart beating when you feel your pulse.
- Blood flows through a circulatory system consisting of arteries, veins and capillaries.
- Blood carries oxygen and nutrients to cells throughout the body, and carries away waste products, including carbon dioxide.
- Good heart health is an important part of healthy living.

### Extension and Integration

- Have students keep an “I Wonder” booklet where they can write additional questions that interest them and research the answers.
- Have students make up quiz questions based on what they learned about the heart and the circulatory system and test each other.
- Have students make up illustrated Heart Facts mini-books to share their learning with younger students.
- Have students research, draw and label other internal organs on their own body outline.
- Have students research the heart size and rate of various animals and compare them with humans.
- Place one or more students at stations around the classroom representing the heart, lungs, head, arms and legs. Have other students, representing blood, move from the heart to the lungs, back to the heart and then to one of the limbs and back. When they understand the motion, have them carry sunflower seeds, peas in a pod or similar food items in a bag to the limbs and open the shells and remove the seeds to simulate providing nutrients and oxygen to parts of the body; then have them collect the shells in another bag to represent wastes.

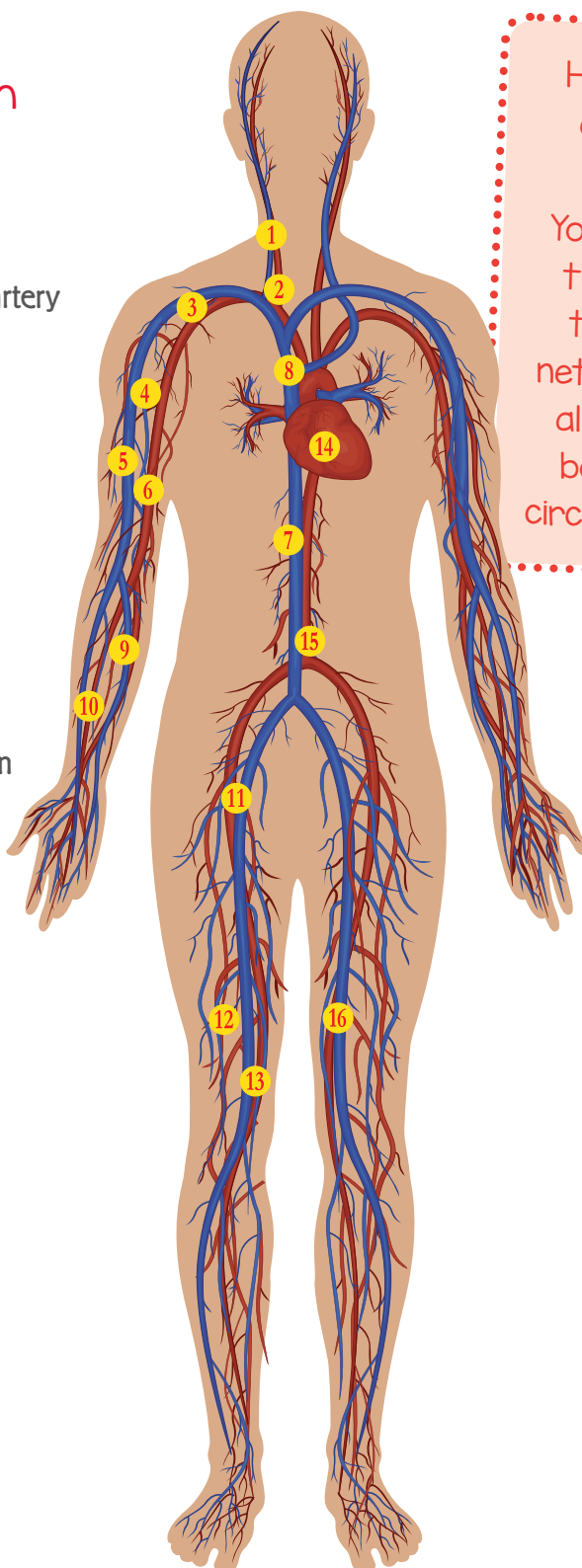
# the circulatory system



**Your heart beats more than once every second.** It pumps blood through blood vessels to cells in every part of your body. **Why?** To supply oxygen and nutrients your body needs and to take away waste products. Your heart helps your cells stay alive and healthy.

## The Circulatory System

- 1 Jugular vein
- 2 Carotid artery
- 3 Shoulder (subclavian) vein and artery
- 4 Arm (brachial) artery
- 5 Outer arm (cephalic) vein
- 6 Inner arm (basilic) vein
- 7 Inferior vena cava
- 8 Superior vena cava
- 9 Inner forearm (radial) artery
- 10 Outer forearm (ulnar) artery
- 11 Lower body (iliac) artery and vein
- 12 Thigh (femoral) artery
- 13 Leg (saphenous) vein
- 14 Heart
- 15 Aorta
- 16 Thigh (femoral) vein

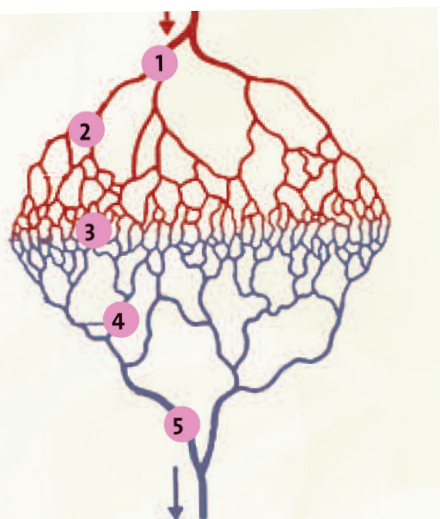
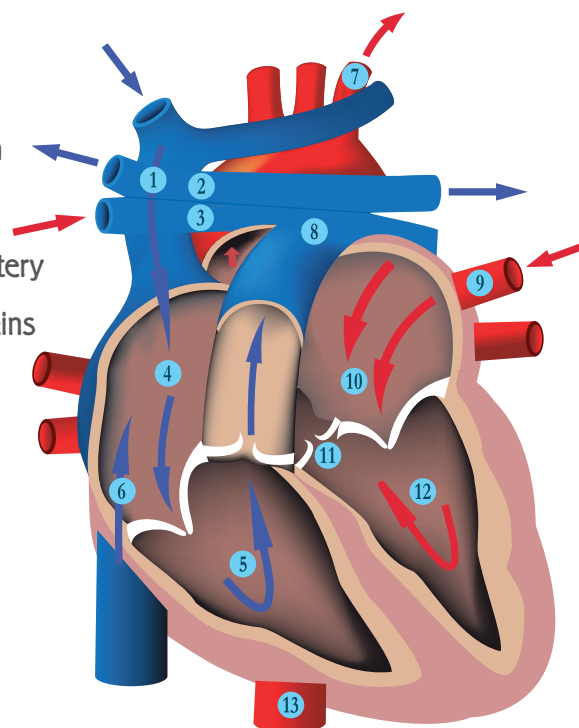


How do nutrients and oxygen get to your cells?

Your blood carries them through a transportation network that runs all through your body, called the circulatory system.

## Parts of the Heart

- 1 Superior Vena Cava
- 2 Right Pulmonary Artery
- 3 Right Pulmonary Veins
- 4 Right Atrium
- 5 Right Ventricle
- 6 Inferior Vena Cava
- 7 Ascending Aorta
- 8 Left Pulmonary Artery
- 9 Left Pulmonary Veins
- 10 Left Atrium
- 11 Valve
- 12 Left Ventricle
- 13 Descending Aorta
- 14 Circulation



### The Capillary Connection

- 1 Arteries
- 2 Arterioles (small arteries)
- 3 Capillaries
- 4 Venules (small veins)
- 5 Veins

**That transportation network, the circulatory system, has three kinds of blood vessels:**

- ★ **Arteries** carry oxygen and nutrients from the heart to the cells.
- ★ **Capillaries** are tiny vessels, thinner than a hair, that run beside every cell in your body. The walls of the capillaries are so thin that oxygen and nutrients can pass through them and into the cells. Waste products from the cells also pass through the walls into the capillaries.
- ★ **Veins** carry blood from the cells back to the heart and other organs to dispose of wastes.

The heart and blood vessels make up the **circulatory system**.

- ★ Your heart is a hollow muscle, a bit bigger than your fist, and has 4 chambers. When it stretches open, blood flows in. When it squeezes, blood squirts out of little flaps of connective tissue, called heart valves, which act as gates, letting the blood come in and out.

- ★ The heart pumps blood through the **pulmonary artery** to the lungs, where it picks up oxygen from the air you breathe and gets rid of waste carbon dioxide from the cells. The fresh oxygen turns the blood bright red.
- ★ The blood returns to the heart, which then pumps it out through the main artery, or **aorta**. The aorta divides into arteries, which carry blood to the rest of your body. Along the way, arteries pick up nutrients from the food you eat
- ★ In the capillaries, the blood exchanges oxygen and nutrients for carbon dioxide and other wastes from the cells. When it loses oxygen, the blood turns bluish.
- ★ The blood flows from the capillaries to the veins and back to the heart - and the entire process, which takes about a minute, starts all over again.



# blood flow and sequence



Read the “Circulatory System” and complete the following:

1. Match the words provided below to the correct spaces.
2. Review each of the completed sentences and number them in order of blood flow from the heart.

\_\_\_\_\_ The blood goes back to the \_\_\_\_\_.

\_\_\_\_\_ Blood is pumped through blood \_\_\_\_\_  
back to the \_\_\_\_\_.

\_\_\_\_\_ New oxygen goes into the \_\_\_\_\_.

\_\_\_\_\_ The blood vessels \_\_\_\_\_ the blood to all parts of the body.

\_\_\_\_\_ The heart pumps blood to the \_\_\_\_\_.

\_\_\_\_\_ The heart \_\_\_\_\_ blood.

## Words

Carry  
Heart  
Vessels  
Blood  
Lungs  
Heart  
Pumps

## Order

First  
Second  
Third  
Fourth  
Fifth  
Sixth

Answers: First, the heart pumps blood. Second, the blood vessels carry the blood to all parts of the body. Third, the blood goes back to the heart. Fourth, the heart pumps blood to the lungs. Fifth, new oxygen goes into the blood. Sixth, blood is pumped through blood vessels back to the heart.