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15-1 What is the circulatory system?

Lesson Review

PART A Complete the following.

1. What is circulation? _____
2. Describe a closed circulatory system. _____

3. Check each statement that is true about the circulatory system.
 - _____ a. made up of the heart, blood vessels, and blood
 - _____ b. made up of a protective frame of bones
 - _____ c. transports food and oxygen
 - _____ d. made up of nerve cells and the brain
 - _____ e. transports carbon dioxide away from cells
 - _____ f. helps the body fight disease
 - _____ g. hormones send messages through this system
 - _____ h. regulates body temperature
4. In the circulatory system, what connects the arteries to veins? _____
5. What is a hormone? _____

Skill Challenge

Skills: *organizing, relating concepts*

Read each action in the table. Then, decide if the circulatory system is transporting materials, protecting the body, or regulating temperature. Use the terms *transport*, *protection*, or *regulation* to identify the kind of job being performed by the circulatory system in the second column of the table.

FUNCTIONS OF THE CIRCULATORY SYSTEM	
Action	Kind of Job
1. Potassium and oxygen are taken to body cells.	
2. White blood cells destroy a virus.	
3. Hormone is carried from a gland to another organ.	
4. Blood vessels near skin narrow to keep in heat.	
5. White blood cells destroy bacteria.	
6. Blood vessels near the skin become wider to give off heat.	

15-2 What are the parts of the heart?

Lesson Review

PART A Match each term in **Column B** with its description in **Column A**. Write the correct letter in the space provided.

Column A

- _____ 1. upper chamber of the heart
- _____ 2. lower chamber of the heart
- _____ 3. thick tissue wall that separates the left and right sides of the heart
- _____ 4. thin flap of tissue that acts as a one-way door
- _____ 5. instrument used to listen to the heart
- _____ 6. rhythm of pumping blood

Column B

- a. ventricle
- b. atrium
- c. valve
- d. septum
- e. heartbeat
- f. stethoscope

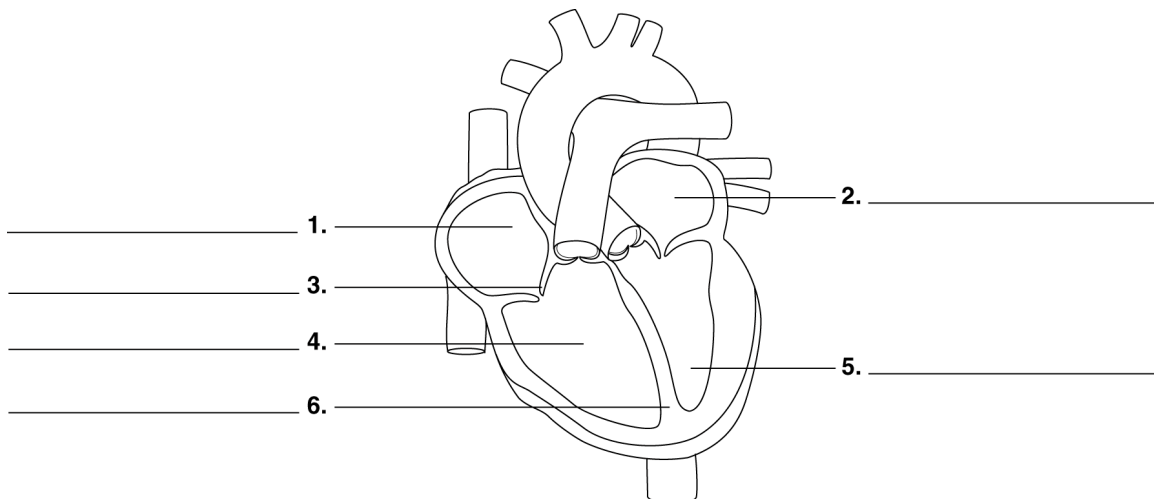
PART B Answer the following.

1. Where does blood flow into the heart? _____
2. When do the atria contract? _____
3. What structures keep blood from flowing from the ventricles to the atria? _____
4. When do the ventricles contract? _____
5. What structures keep blood in the blood vessels from flowing back to the ventricles?

Skill Challenge

Skills: *identifying, labeling*

In the spaces provided, label the parts of the heart. Use the terms *right atrium*, *valve*, *right ventricle*, *left atrium*, *left ventricle*, and *septum*.



Comparing Heart Valves

Enrichment Activity for Lesson 15-2

Skills: *applying concepts, researching, modeling*

PART A Each of the valves in the heart has a different shape. Use reference materials to research each of the heart valves listed below. Then, describe the shape, location, and function of each valve in the spaces provided.

1. **bicuspid valve:** _____

2. **tricuspid valve:** _____

3. **aortic semilunar valve:** _____

4. **pulmonary semilunar valve:** _____

PART B Draw a diagram of the heart in the space below. Label the following structures in your diagram: *right atrium, left atrium, right ventricle, left ventricle, septum, aorta, bicuspid valve, tricuspid valve, aortic semilunar valve, pulmonary semilunar valve, and pulmonary arteries.*



15-3 What are blood vessels?

Lesson Review

PART A Complete the following.

1. What are blood vessels? _____
2. How many kinds of blood vessels are there? _____
3. What are arteries? _____
4. What is the aorta? _____
5. What are veins? _____
6. What kinds of blood vessels connect arteries to veins? _____

PART B Match each blood vessel to its description. Write the correct letter in the space provided.

- | | | |
|-------|-------------------------------------------------------------------|----------------|
| _____ | 1. have thick, muscular walls | a. capillaries |
| _____ | 2. tiny vessels through which substances are exchanged with cells | b. veins |
| _____ | 3. contain valves to keep blood from flowing backward | c. arteries |

Skill Challenge

Skills: *comparing, classifying*

Decide if each characteristic in the table describes arteries, veins, or capillaries. Place a check mark in the correct column to indicate your answer.

CHARACTERISTICS OF BLOOD VESSELS			
Characteristic	Arteries	Veins	Capillaries
1. Thick, muscular walls			
2. Carry blood to heart			
3. Some have valves			
4. Pumps blood at high pressure			
5. Walls are one cell thick			
6. Connect arteries to veins			
7. Pulse is felt in these			

15-4 What is blood?

Lesson Review

Complete the following.

1. What is blood? _____

2. What is plasma? _____
3. What is the job of red blood cells? _____

4. What is the job of white blood cells? _____

5. What are platelets? _____

6. What are the four blood types? _____
7. What is a transfusion? _____

8. Check the statements that are true about red blood cells.

- | | |
|--------------------------------------|-----------------------------|
| _____ a. mixture of solid and liquid | _____ d. carry oxygen |
| _____ b. do not have nuclei | _____ e. contain hemoglobin |
| _____ c. large cells with nuclei | _____ f. help fight disease |

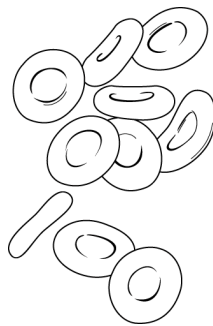
Skill Challenge

Skills: analyzing, relating concepts, classifying

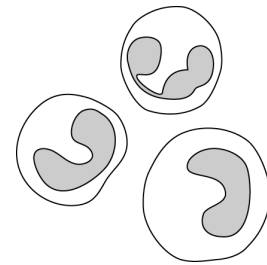
Study the illustrations. Then, in the spaces provided, identify each illustration using the terms *red blood cells*, *white blood cells*, or *platelets*.



1. _____



2. _____



3. _____

Investigating Blood Types

Enrichment Activity for Lesson 15-4

Skills: *inferring, graphing, relating concepts*

Human blood is classified into four types: A, B, AB, and O. The plasma in each blood type contains certain chemicals. The chemicals in one blood type may cause problems if mixed with those of another blood type. As a result, each blood type can only be used with certain other blood types.

PART A The table below shows the relationships among the blood types. It also shows the percentage of the population that has each blood type. Use the information in the table to answer the questions.

BLOOD TYPES		
Blood Type	Accepts Transfusions from These Blood Types	Percent of Population with This Blood Type
A	A, O	42%
B	B, O	10%
AB	A, B, AB, and O	3%
O	O	45%

- A person with type B blood needs a transfusion. Which blood types can this person be given?

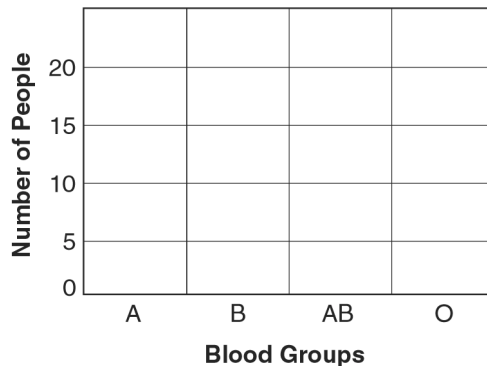
- Which blood types can receive type A blood? _____
- Suppose you surveyed the students in your school about their blood type. Which blood type would most students probably have? _____
 - Which blood type would the fewest students probably have? _____
- Why do you think type O blood is called the universal donor? _____

- Type AB blood is called the universal recipient. Why? _____

PART B Survey 20 people about their blood type. Use the survey data to make a bar graph on the grid.

Survey Results

- A _____
 B _____
 AB _____
 O _____



15-5 What happens to blood as it circulates?

Lesson Review

Match each term in **Column B** with its description in **Column A**. Write the correct letter in the space provided.

Column A	Column B
_____ 1. receives blood from body	a. left atrium
_____ 2. receives blood from pulmonary veins	b. capillary in lungs
_____ 3. pumps blood into aorta and body	c. capillary in body
_____ 4. pumps blood into pulmonary artery	d. right ventricle
_____ 5. gives up oxygen and picks up carbon dioxide	e. left ventricle
_____ 6. gives up carbon dioxide and picks up oxygen	f. right atrium

Skill Challenge

Skills: *identifying, diagramming, applying concepts*

Put the steps of circulation in order. Write the numbers 1–10 in the spaces provided. The first one is done for you.

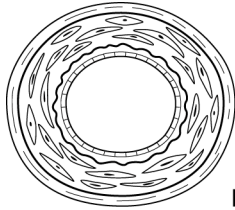
- _____ a. Blood passes from the body's arteries to capillaries.
- _____ b. Right ventricle pumps blood into the pulmonary artery.
- 1 c. Blood is pumped from the left ventricle to the aorta.
- _____ d. Blood passes from the right atrium into the right ventricle.
- _____ e. Blood passes from the left atrium into the left ventricle.
- _____ f. Pulmonary veins carry blood from the lungs to the left atrium.
- _____ g. Blood from the aorta branches into many smaller arteries.
- _____ h. Blood passes from pulmonary arteries into the lung capillaries.
- _____ i. Blood in the veins is carried to the right atrium.
- _____ j. Blood passes from the body's capillaries to the veins.
- _____ k. Blood in the body capillaries releases oxygen and picks up carbon dioxide.
- _____ l. Blood in the lung capillaries releases carbon dioxide and picks up oxygen.

15-6 What is heart disease?

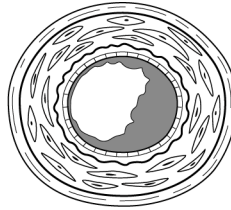
Lesson Review

Complete the following.

1. The diagrams show two arteries. What kind of heart disease is affecting the artery on the right?



Healthy Artery



Diseased Artery

2. What causes a heart attack? _____

3. What are the coronary arteries? _____

4. What are two factors that contribute to developing heart disease? _____

5. What parts of the body does heart disease affect? _____

6. Explain why your chances of developing heart disease increase if someone in your family has had heart disease. _____

Skill Challenge

Skills: researching, identifying, relating

Describe how each of the following can contribute to heart disease.

1. obesity _____

2. gender _____

3. smoking _____

4. physical inactivity _____

5. diet _____

THE **Big** IDEA

Integrating Technology

Chapter 15 How is technology used to treat cardiovascular disease?

Lesson Review

Refer to the article, call outs, and pictures on pages 370 and 371 of your text to answer the following questions.

1. About how many people have heart disease? _____
2. What is an arteriogram? _____

3. What is the purpose of angioplasty? _____

Skill Challenge

Skills: *inferring, analyzing, researching*

Complete the following.

1. Why does robotic surgery allow for faster recovery than traditional open-heart surgery?

2. Why might safe and effective artificial hearts be better than heart transplants? _____

3. Robert Tools lived for nearly five months after he received the world’s first totally implantable artificial heart. His doctors called him a hero. Why might he be considered a hero? _____

Science Log Writing Activity

Complete the Science Log on a separate sheet of paper. To complete the Big Idea Online, go to www.conceptsandchallenges.com. Follow the online instructions.