Name _____ Class _____ Date _____

SECTION 3 The Lymphatic System

BEFORE YOU READ

After you read this section, you should be able to answer these questions:

- What is the function of the lymphatic system?
- What are the parts of the lymphatic system?

National Science Education Standards

LS 1a, 1c, 1d, 1e, 1f

What Does the Lymphatic System Do?

Every time your heart pumps, small amounts of plasma are forced out of the thin walls of the capillaries. What happens to this fluid? Most of it is reabsorbed into your blood through the capillaries. Some of the fluid moves into your lymphatic system.

The **lymphatic system** is the group of vessels, organs, and tissues that collects excess fluid and returns it to the blood. The lymphatic system also helps your body fight pathogens.

STUDY TIP

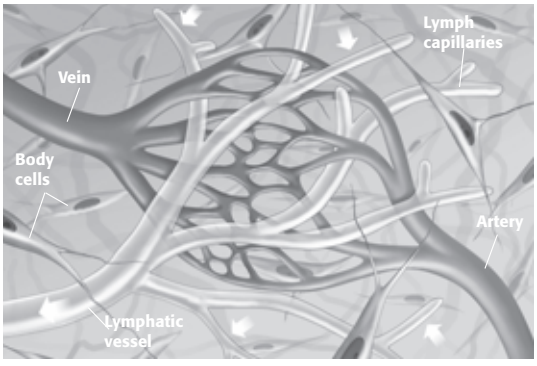
Describe Work with a partner to quiz each other on the names and functions of each structure in the lymphatic system.

What Are the Parts of the Lymphatic System?

Fluid collected by the lymphatic system is carried in vessels. The smallest of these vessels are called lymph capillaries. Larger lymph vessels are called lymphatic vessels. These vessels, along with bone marrow, lymph nodes, the thymus, and the spleen, make up the lymphatic system.

LYMPH CAPILLARIES

Lymph capillaries absorb some of the fluid and particles from between cells in the body. Some of the particles are dead cells or pathogens. These particles are too large to enter blood capillaries. The fluid and particles absorbed into lymph capillaries are called **lymph**.



The white arrows show how lymph moves into lymph capillaries and through lymphatic vessels.

STANDARDS CHECK

LS 1e The human organism has systems for digestion, reproduction, circulation, excretion, movement, control and coordination, and protection from disease. These systems interact with one another.

1. Identify Relationships How do the lymphatic and circulatory systems work together?

LYMPHATIC VESSELS

Lymph capillaries carry lymph into larger vessels called *lymphatic vessels*. Skeletal muscles and valves help push the lymph through the lymphatic system. Lymphatic vessels drain the lymph into large veins in the neck. This returns the fluid to the cardiovascular system. ☑

READING CHECK

2. Identify Where is fluid returned to the cardiovascular system?

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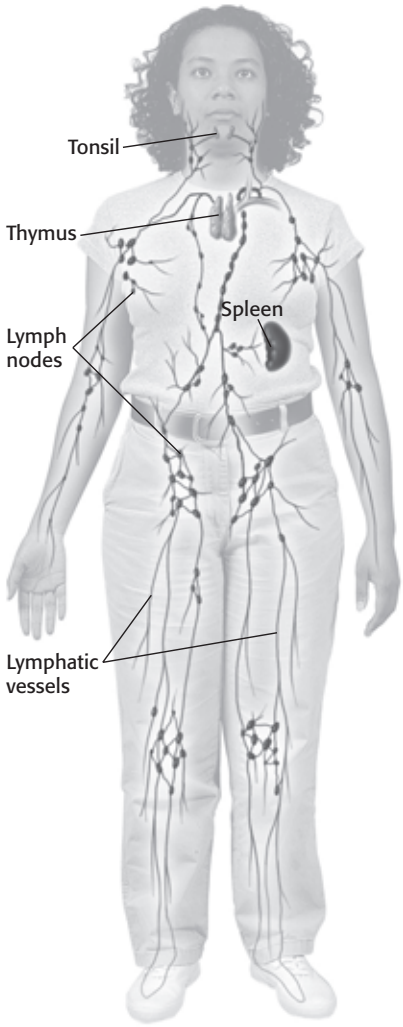
The Lymphatic System



TAKE A LOOK

3. Describe As you read, write on the diagram the function of each labelled structure.

BONE MARROW

Bone marrow is the soft tissue inside bones that makes red and white blood cells. Recall that platelets, which help blood clot, are made in marrow. White blood cells called *lymphocytes* are part of the lymphatic system. They help fight infection. Killer T cell lymphocytes surround and destroy pathogens. B cell lymphocytes make antibodies that cause pathogens to stick together. This marks them for destruction. ☑

READING CHECK

4. Identify What is the function of bone marrow?

_____

_____

LYMPH NODES

As lymph travels through lymphatic vessels, it passes through lymph nodes. **Lymph nodes** are small masses of tissue that remove pathogens and dead cells from the lymph. When bacteria or other pathogens cause an infection, white blood cells multiply and fill the lymph nodes. This may cause lymph nodes to become swollen and painful.

Critical Thinking

5. Infer Sometimes you can easily feel your lymph nodes when they are swollen. If you had swollen lymph nodes, what could you infer?

_____

_____

THYMUS

T cells are made in the bone marrow. Before these cells are ready to fight infections, however, they develop further in the **thymus** gland. The thymus is located just above the heart. Mature T cells leave the thymus and travel through the lymphatic system.

SPLEEN

The **spleen** is the largest lymphatic organ. It stores lymphocytes and fights infection. It is a purplish organ located in the upper left side of the abdomen. As blood flows through the spleen, lymphocytes attack or mark pathogens in the blood. The spleen may release lymphocytes into the bloodstream when there is an infection. The spleen also monitors, stores, and destroys old blood cells. ☑

READING CHECK

6. List Name three functions of the spleen.

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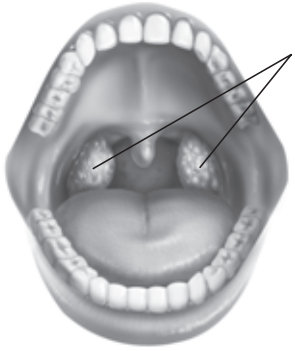
TONSILS

The **tonsils** are lymphatic tissue at the back of the mouth. Tonsils help defend the body against infection by trapping pathogens. Sometimes, however, tonsils can become infected. Infected tonsils may be red, swollen, and sore. They may be covered with patches of white, infected tissue and make swallowing difficult. Tonsils may be removed if there are frequent, severe tonsil infections that make breathing difficult.



Tonsils help protect your throat and lungs from infection by trapping pathogens.

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Section 3 Review

NSES LS 1a, 1c, 1d, 1e, 1f

SECTION VOCABULARY

lymph the fluid that is collected by the lymphatic vessels and nodes

lymph node an organ that filters lymph and that is found along the lymphatic vessels

lymphatic system a collection of organs whose primary function is to collect extracellular fluid and return it to the blood; the organs in this system include lymph nodes and the lymphatic vessels

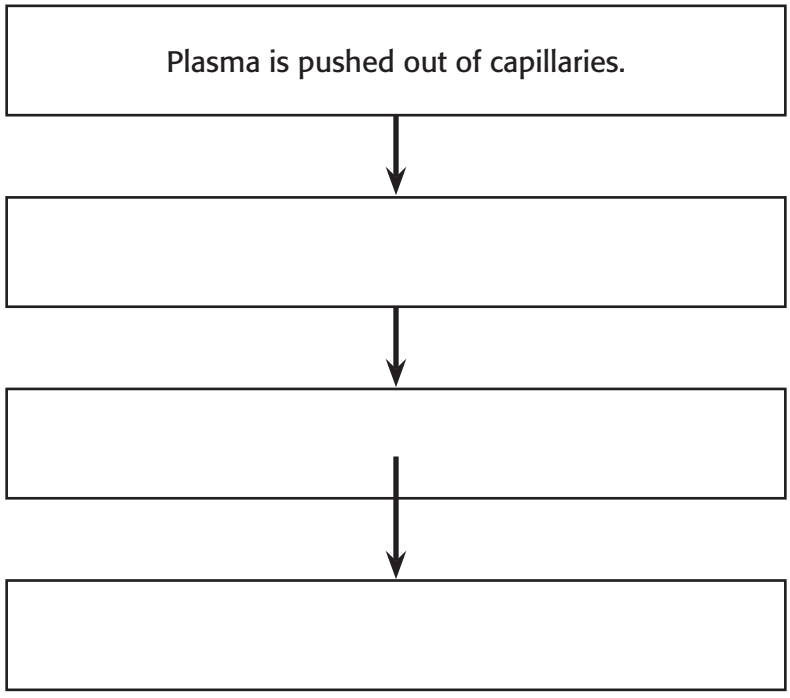
spleen the largest lymphatic organ in the body; serves as a blood reservoir, disintegrates old red blood cells, and produces lymphocytes and plasmids

thymus the main gland of the lymphatic system; it releases mature T lymphocytes

tonsils organs that are small, rounded masses of lymphatic tissue located in the pharynx and in the passage from the mouth to the pharynx

1. Describe How does the lymphatic system fight infection?

2. Summarize Complete the Process Chart below to show how fluid travels between the cardiovascular system and the lymphatic system.



3. List What are three things that can be found in lymph?

4. Analyze Why is it important that lymphatic tissue is spread throughout the body?