

SECTION 2 The Skeletal System

BEFORE YOU READ

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

- What are the major organs of the skeletal system?
- What are the functions of the skeletal system?
- What are the three kinds of joints in the body?

National Science Education Standards
LS 1d, 1e

What Are Bones?

Many people think that bones are dry and brittle, but your bones are actually living organs. Bones are the major organs of the skeletal system. The **skeletal system** is made up of bones, cartilage, and connective tissue.



Organize As you read this section, make a chart listing the functions of bones and the tissue or bone structure that does each job.

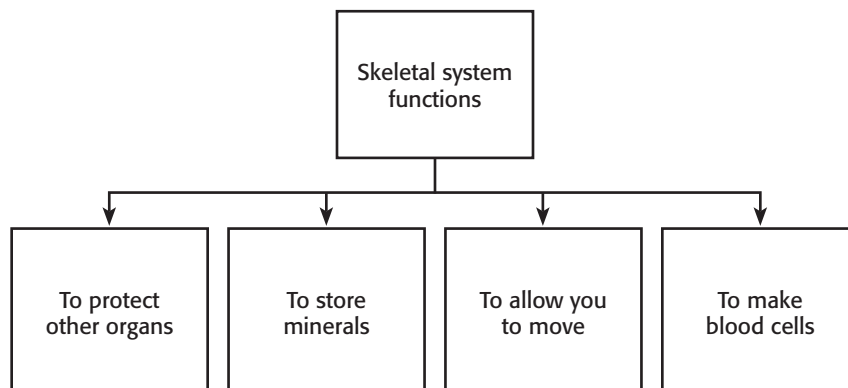
What Are the Functions of the Skeletal System?

An average adult human skeleton has 206 bones. Bones have many jobs. For example, they help support and protect your body. They work with your muscles so you can move. Bones also help your body maintain homeostasis by storing minerals and making blood cells. The skeletal system does the following jobs for your body:

- It protects other organs. For example, your rib cage protects your heart and lungs.
- It stores minerals that help your nerves and muscles work properly. Long bones store fat that can be used as energy.
- Skeletal muscles pull on bones to cause movement. Without bones, you would not be able to sit, stand, or run.
- Some bones make blood cells. *Marrow* is a special material that makes blood cells.

Critical Thinking

1. Predict Name one organ system, other than the skeletal system, that would be affected if you had no bones. Explain your answer.



SECTION 2 The Skeletal System *continued*

What Is the Structure of a Bone?

A bone may seem lifeless. Like other organs, however, bone is a living organ made of several different tissues. Bone is made of connective tissue and minerals. Living cells in the bone deposit the minerals.

BONE TISSUE

If you look inside a bone, you will see two kinds of bone tissue: spongy bone and compact bone. Spongy bone has many large open spaces that help the bone absorb shocks. Compact bone has no large open spaces, but it does have tiny spaces filled with blood vessels. ✓

READING CHECK

2. Identify What are the two kinds of bone tissue?

MARROW

Some bones contain a tissue called marrow. There are two types of marrow. Red marrow makes red and white blood cells. Yellow marrow stores fat.

CARTILAGE

Did you know that most of your skeleton used to be soft and rubbery? Most bones start out as a flexible tissue called *cartilage*. When you were born, you didn't have much true bone. As you grow, your cartilage is replaced by bone. However, bone will never replace cartilage in a few small areas of your body. For example, the end of your nose and the tops of your ears will always be made of cartilage. ✓

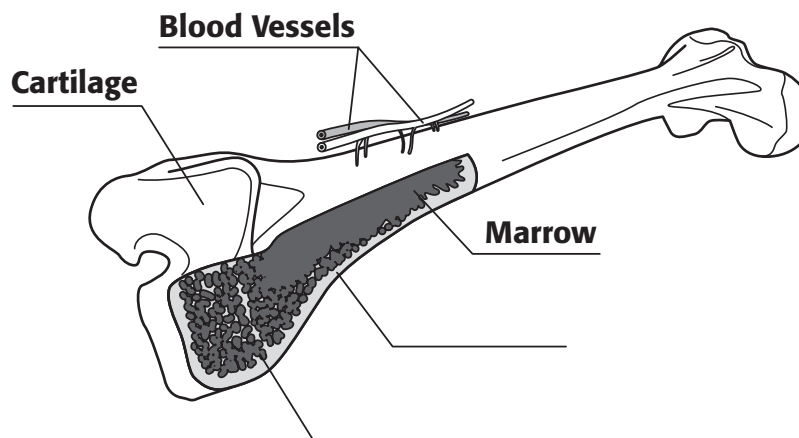
READING CHECK

3. Define What is cartilage?

TAKE A LOOK

4. Label Fill in the missing labels for tissues that are found in this bone.

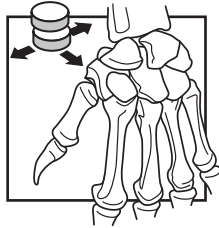
Bone Tissues



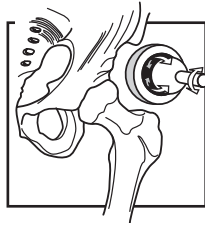
SECTION 2 The Skeletal System *continued*

What Is a Joint?

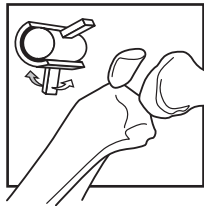
A place where two or more bones meet is called a **joint**. Some joints, called *fixed joints*, do not let bones move very much. Many of the joints in the skull are fixed joints. However, most joints let your bones move when your muscles *contract*, or shorten. Joints can be grouped based on how the bones in the joint move. ✓



Gliding Joint Gliding joints let bones in the wrist slide over each other. This type of joint makes a body part flexible.



Ball-and-Socket Joint In the same way that a video-game joystick lets you move your character around, the shoulder lets your arm move freely in all directions.



Hinge Joint A hinge lets a door open and close. Your knee joint lets your leg bend in only one direction.

Joints can handle a lot of wear and tear because of how they are made. Joints are held together by ligaments. *Ligaments* are strong bands of connective tissue. Cartilage covers the ends of many bones and helps cushion the areas where bones meet. ✓

SKELETAL SYSTEM INJURIES AND DISEASES

Sometimes, parts of the skeletal system are injured. For example, bones may be broken. Joints and ligaments can also be injured. Many of these injuries happen when too much stress is placed on the skeletal system.

There are also some diseases that affect the skeletal system. For example, the disease *osteoporosis* makes bones brittle and easy to break. Some diseases make bones soft or affect bone marrow. *Arthritis* is a disease that makes joints stiff, so they are painful and hard to move.

✓ **READING CHECK**

5. Define What is a joint?

TAKE A LOOK

6. List What are the three types of joints in the human body?

✓ **READING CHECK**

7. Identify How does cartilage help protect bones and joints?

Section 2 Review

NSES LS 1d, 1e

SECTION VOCABULARY

joint a place where two or more bones meet	skeletal system the organ system whose primary function is to support and protect the body and to allow the body to move
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1. **List** What are four functions of the skeletal system?

2. **Identify** What three things make up the skeletal system?

3. **Describe** Fill in the chart below to describe the three types of joints. Give an example of each.

Type of joint	Example
	wrist
hinge	

4. **Compare** What is the difference between red marrow and yellow marrow?

5. **Explain** What happens to the cartilage in your body as you grow up?

6. **Identify** What are two diseases that can affect the skeletal system?

7. **Describe** Describe a joint and its structure.

8. **Explain** What causes most injuries to the skeletal system?
