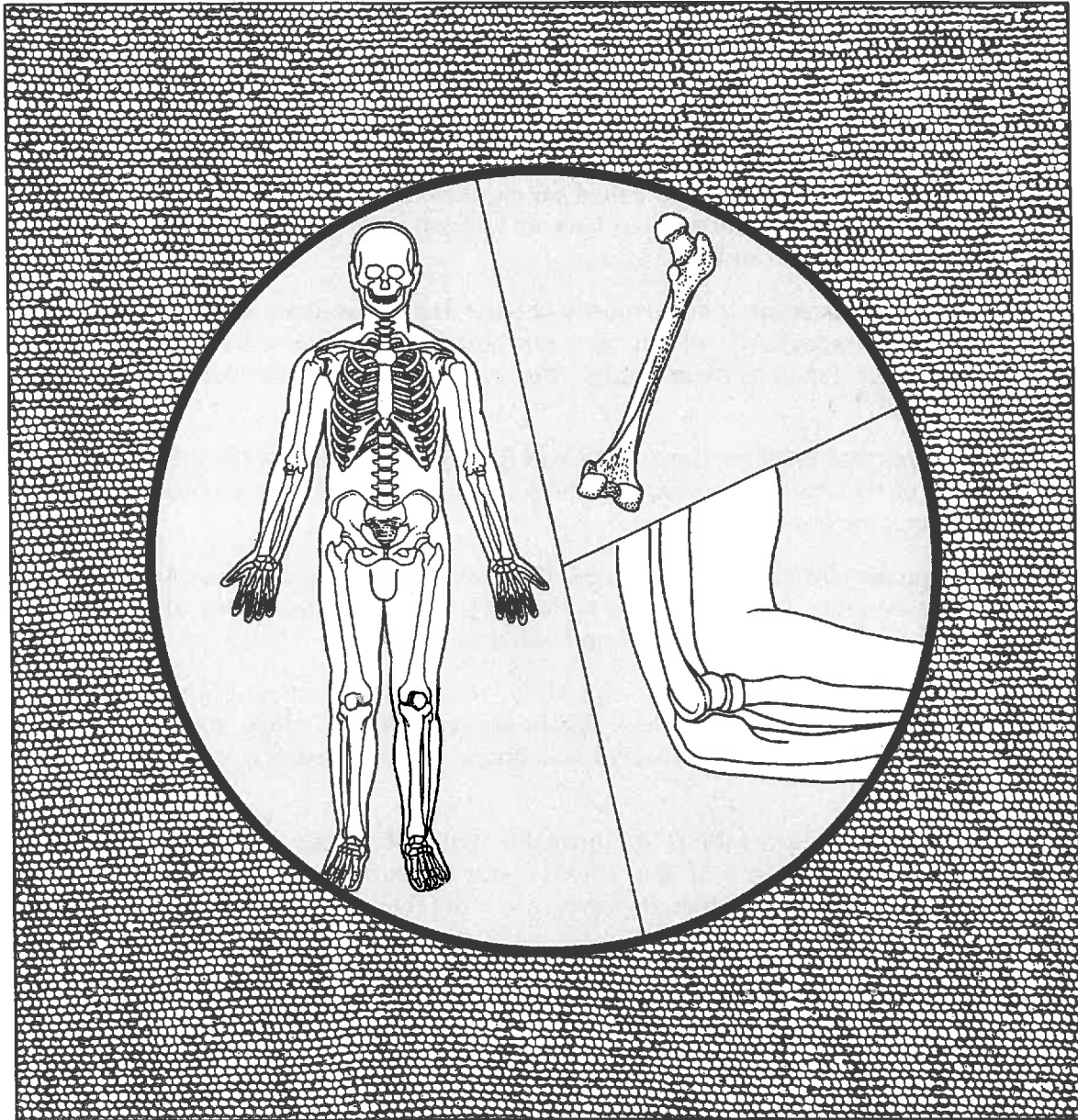


## SUPPORT AND MOVEMENT

# What is the skeletal system?

3



**cartilage** [KART-ul-idj]: tough, flexible connective tissue

**joint**: place where two or more bones meet

**ligaments** [LIG-uh-ments]: tissue that connects bone to bone

**marrow**: soft tissue in a bone that makes blood cells

# LESSON

## 3

# What is the skeletal system?

Have you ever seen a house being built? The first thing that goes up is the frame. It supports the entire house.

Humans, and many other animals, have a frame, too. It supports their bones. This frame is the skeleton. Some animals, like crabs and insects, have a hard outer skeleton called an exoskeleton [ek-soh-SKEL-uh-tun]. Humans, and other vertebrates, have an internal skeleton, or endoskeleton [en-duh-SKEL-uh-tun].

The human skeleton is made mostly of bone. It also has some softer tissues called **cartilage** [KART-ul-idj]. Your ears and the tip of your nose are made of cartilage. Squeeze them gently. They can move. You cannot bend bone that way!

Cartilage also lines the inner surface of most **joints**. A joint is the meeting place of two bones. Cartilage in the joints acts like a shock absorber. It cushions the bones.

The human skeleton has 206 bones. The skeleton supports the body, but it does even more. For example the skeleton also protects vital organs, allows free movement, and makes red and white blood cells.

**PROTECTION** Think about your body. Your brain, heart, and lungs are three of your vital organs. These organs are protected by bones. Your skull protects your brain. Your ribs and breastbone (sternum) protect your heart and lungs.

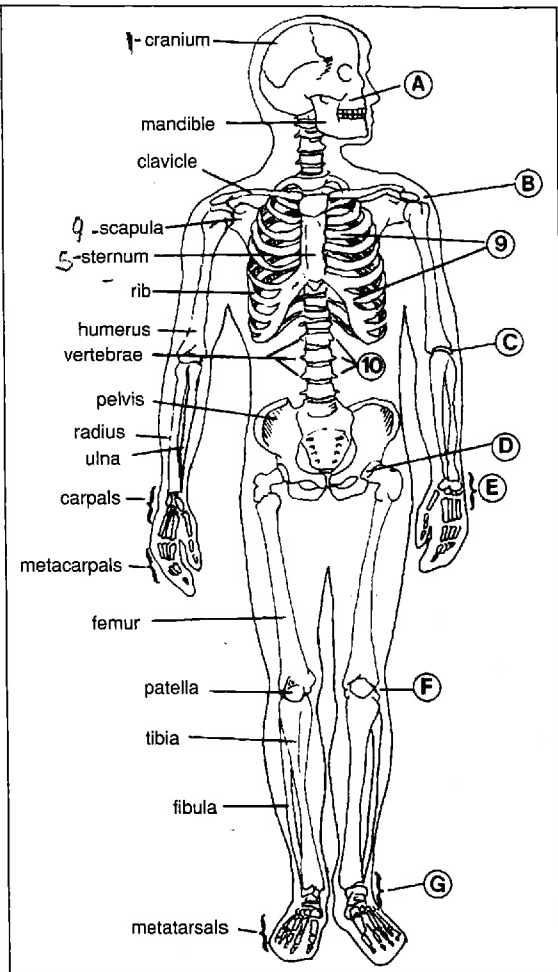
**MOVEMENT** Some joints are moveable. Other joints are not moveable. For example, the joints of your skull are not moveable. The joints of your arms, legs, hands, and feet, however, are moveable.

Most joints are held together by **ligaments** [LIG-uh-ments]. Ligaments stretch easily. This allows the bones to move easily. Bones and muscles work together to produce movement.

**BLOOD CELL PRODUCTION** Bones have tubelike canals. They are filled with soft tissue called **marrow**. Red blood cells and some white blood cells are made in the bone marrow.

# THE HUMAN SKELETON

Figure A shows many of the 206 bones of the human skeleton. Study the diagram. Then answer the questions.



1. a) The human skeleton is an \_\_\_\_\_ skeleton.  
internal, external
- b) What do we call an internal skeleton? \_\_\_\_\_
2. The human skeleton is made mostly of hard \_\_\_\_\_ tissue.
3. a) What do we call the flexible tissue that makes up some parts of the skeleton?  
\_\_\_\_\_

Figure A

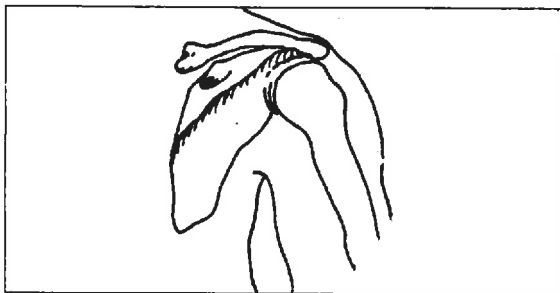
- b) Name two parts of the skeleton that are made of this tissue. \_\_\_\_\_  
\_\_\_\_\_
4. Look at Figure A again. Find each of the bones listed below. Then write the scientific name for each of these bones.
 

a) kneecap _____	f) hip bone _____
b) shin bone _____	g) collar bone _____
c) skull _____	h) shoulder blade _____
d) breastbone _____	i) backbone _____
e) jaw bone _____	j) thigh bone _____
5. What two bones make up the lower leg? \_\_\_\_\_
6. What is the name of the place where two bones meet? \_\_\_\_\_

7. Which bone is most important for talking? \_\_\_\_\_
8. What bones make up the spinal column? \_\_\_\_\_
9. Identify each of these joints. Write the letter of the joint on the line next to its description.
- |                         |                    |
|-------------------------|--------------------|
| a) knee joint _____     | e) ankle _____     |
| b) elbow _____          | f) jaw joint _____ |
| c) wrist _____          | g) hip joint _____ |
| d) shoulder joint _____ |                    |
10. Number 9 points to cartilage.
- a) Which bones does this cartilage connect? \_\_\_\_\_
- b) Why must these parts be made of cartilage? \_\_\_\_\_  
\_\_\_\_\_
11. Part 10 of the skeleton are also cartilage.
- a) Which bones do these cartilage "discs" connect? \_\_\_\_\_
- b) Why are these cartilage discs important? \_\_\_\_\_  
\_\_\_\_\_

## JOINTS

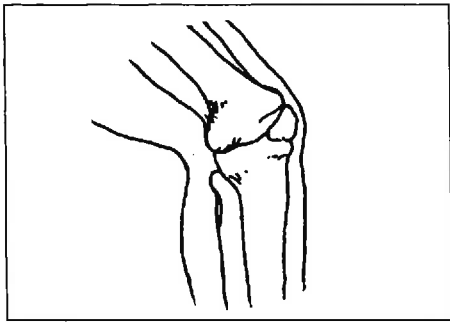
Bones move only at joints. There are three main kinds of joints in the body. They are fixed joints, partly-moveable joints, and moveable joints. Fixed joints do not allow any movement. The joints of your skull are not moveable. Partly-moveable joints allow a little movement. The joints between your ribs move a little. However, most of the joints in the body are moveable joints. There are four kinds of moveable joints. They are described below.



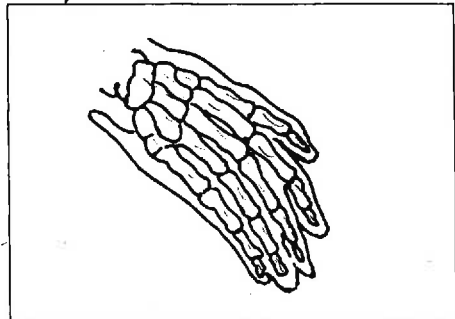
**Figure B** A ball-and-socket joint.

A ball-and-socket joint can be twisted. It permits movement in many directions. This includes rotating movements. The shoulder joint is an example of a ball-and-socket joint.

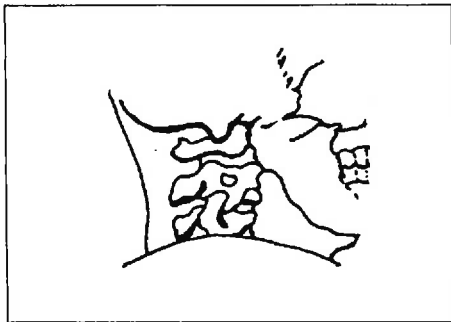
1. Name another ball-and-socket joint of your body. \_\_\_\_\_



**Figure C** A hinge joint.



**Figure D** A gliding joint.



**Figure E** A pivotal joint.

A hinge joint can move in only one direction, like a door hinge. The knee is an example of a hinge joint.

Bend your elbow.

2. How many directions can your elbow bend? \_\_\_\_\_
3. Name another hinge joint in your body. \_\_\_\_\_

A gliding joint allows some movement in all directions. Your wrist has gliding joints.

Pivotal joints allow bones to move side-to-side and up-and-down. The joint between your skull and neck is a pivotal joint.

## MATCHING

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

- Column A**
- \_\_\_\_\_ 1. backbone
  - \_\_\_\_\_ 2. shoulder joint
  - \_\_\_\_\_ 3. elbow joint
  - \_\_\_\_\_ 4. cartilage
  - \_\_\_\_\_ 5. marrow

- Column B**
- a) hinge joint
  - b) connects moveable bones
  - c) made up of vertebrae
  - d) fills some bone canals
  - e) ball-and-socket joint

## FILL IN THE BLANK

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Complete each statement using a term or terms from the list below. Write your answers in the spaces provided.

joint  
bones  
outer ears  
movement  
hinge  
support

skull  
spinal cord  
cartilage  
ligaments  
internal  
ribs

blood cells  
ball-and-socket  
breastbone  
protect  
nose

1. The human skeleton is an \_\_\_\_\_ skeleton.
2. The human skeleton is made up of 206 \_\_\_\_\_ and some \_\_\_\_\_.
3. The \_\_\_\_\_ and the tip of the \_\_\_\_\_ are made of cartilage.
4. Bones serve four purposes. Bones \_\_\_\_\_, \_\_\_\_\_, allow \_\_\_\_\_, and make \_\_\_\_\_.
5. The brain is protected by the bones of the \_\_\_\_\_.
6. The heart and lungs are protected by the \_\_\_\_\_ and \_\_\_\_\_.
7. The backbone encloses and protects the \_\_\_\_\_.
8. The place where two bones meet is called a \_\_\_\_\_.
9. Two kinds of movable joints are the \_\_\_\_\_ joint and the \_\_\_\_\_ joint.
10. The bones at moveable joints are connected to one another by \_\_\_\_\_.

## REACHING OUT RESEARCH

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Not all white blood cells are made in the bone marrow. There are two other parts of the body that make white blood cells. Use an encyclopedia, or another resource book, to find out what other parts of the body make white blood cells. (Hint: White blood cells are also called leukocytes [LOO-koh-syts]).

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