



Chapter 9-2: The Skeletal System

The human skeleton consists of 206 bones that differ in size, shape, weight, and composition. This diversity is related to the myriad structural and mechanical functions of the skeleton, which include supporting the body, protecting the body cavities, acting as levers for muscle activity, and providing a site for blood cell development.

The skeletal system is divided into two major parts: The axial skeleton, which is composed of the skull, vertebral column, sternum, and ribs; and the appendicular skeleton, which is composed of the upper and lower extremities and the supporting girdles.

Looking over the plate, you will note that it contains an anterior (front) view of the skeleton with the palms facing forward. As you read about the skeletal system, color the appropriate bones in the plate. There may be some overlapping, and pale colors are suggested for these areas.

The first structure of the axial skeleton that we'll talk about is the skull. This structure houses the brain and is the location of many sensory organs. The two main features of the skull are the **cranium (A)** and **face (B)**. The skull contains twenty-nine bones, many of which are paired; the face contains fourteen of these bones. The only bone that's not attached directly to the other bones of the skull is the lower jaw bone, which is called the **mandible (C)**.

The skull and upper torso of the body are supported by another main component of the axial skeleton, the **vertebral column (G)**. There are thirty-one bones in this column, which extends along the back of the body and connects to the thoracic cage. At the front, the thoracic cage is made up of a three-part bone called the **sternum (E₁)** and a set of twelve pairs of **ribs (E₂)** that connect the sternum to the vertebral column.

Having examined the axial skeleton, we now move to the appendicular skeleton and look at some of its bones. Continue reading, and as you encounter the bones in the text, color them in the plate.

The **upper extremity (F)** of the axial skeleton is composed of the pectoral girdle and arm bones. The **pectoral girdle (D)** is outlined by a bracket which you should color. It contains two bones: the collar bone, or **clavicle (D₁)** in the front of the body, and a flat, triangular bone called the **scapula (D₂)**, which is located at the back of the body.

Connecting to the pectoral girdle is the upper arm bone, the **humerus (F₁)**. The two lower arm bones that connect with the humerus are the **radius (F₂)** and the **ulna (F₃)**. The wrist bones are called **carpals (F₄)**, the hand bones are **metacarpals (F₅)**, and the finger bones are **phalanges (F₆)**.

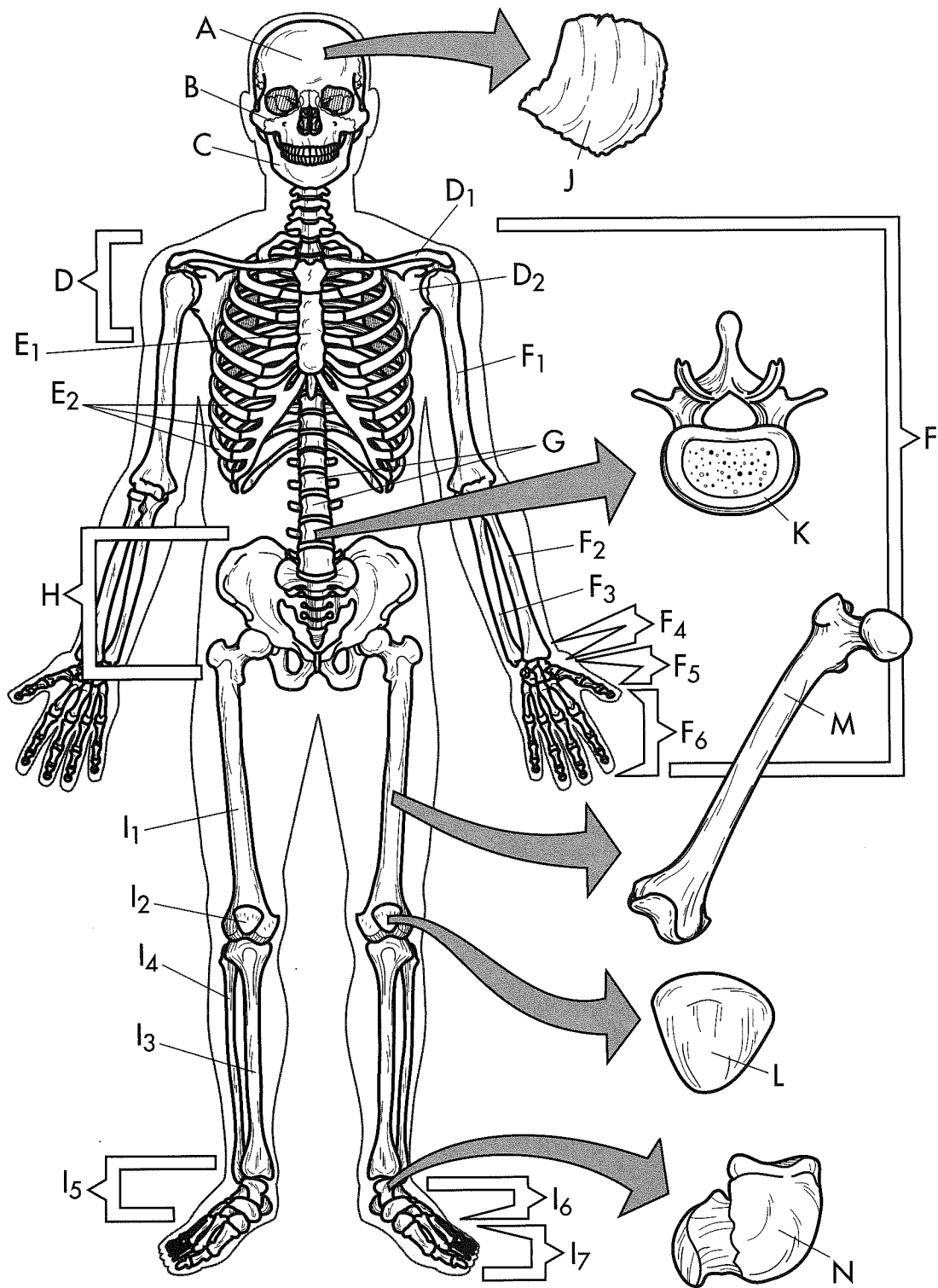
At the lower portion of the body is the **pelvic girdle (H)**, which is indicated by the bracket. This bone appears to be singular, but it is actually made up of three fused bones called the ilium, ischium, and pubis. Connecting to the pelvic girdle is the lower extremity. It consists of the thigh bone, called the **femur (I₁)**, the knee cap, or **patella (I₂)**, and two lower leg bones, the **tibia (I₃)** and the **fibula (I₄)**. The ankle contains the **tarsals (I₅)**, and the foot bones are **metatarsals (I₆)**. The toe bones are the **phalanges (I₇)**. This completes our brief sketch of the appendicular skeleton.

We will conclude by mentioning the five different types of bones that make up the skeletal system. Take a look at the detailed views on the right. Dark colors should be used for these bones.

Bones are classified according to their function in the body as well as their shape. For instance, one example of a **flat bone (J)** would be a bone of the skull. These bones are thin and serve to protect the brain; the scapula and ribs are other examples of flat bones. An **irregular bone (K)** is typified by the vertebra of the spinal column. Irregular bones are characterized by numerous extensions, and muscles often attach to them.

One example of a **sesamoid bone (L)** is the patella. Sesamoid bones are small and are usually embedded in tendons and used to protect the integrity of the tendon. **Long bones (M)** are used for movement. In the leg, for example, the femur acts as an attachment point for the muscles, and as the muscles contract, the bone moves.

The last bone we will consider is the **short bone (N)**. Short bones have similar dimensions but irregular shapes and are found in the wrists and ankles (for example, carpals and tarsals).



The Skeletal System

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|---|--|---|---|--|
| <input type="radio"/> CraniumA | <input type="radio"/> Sternum.....E ₁ | <input type="radio"/> Carpals.....F ₄ | <input type="radio"/> Femur.....I ₁ | <input type="radio"/> Flat boneJ |
| <input type="radio"/> Face.....B | <input type="radio"/> RibsE ₂ | <input type="radio"/> Metacarpals..F ₅ | <input type="radio"/> Patella.....I ₂ | <input type="radio"/> Irregular Bone.....K |
| <input type="radio"/> Mandible.....C | <input type="radio"/> Upper ExtremityF | <input type="radio"/> Phalanges....F ₆ | <input type="radio"/> Tibia.....I ₃ | <input type="radio"/> Sesamoid Bone.....L |
| <input type="radio"/> Pectoral Girdle.....D | <input type="radio"/> Humerus.....F ₁ | <input type="radio"/> Vertebral Column.....G | <input type="radio"/> FibulaI ₄ | <input type="radio"/> Tarsals.....I ₅ |
| <input type="radio"/> ClavicleD ₁ | <input type="radio"/> RadiusF ₂ | <input type="radio"/> Pelvic Girdle.....H | <input type="radio"/> Metatarsals..I ₆ | <input type="radio"/> Long BoneM |
| <input type="radio"/> Scapula.....D ₂ | <input type="radio"/> UlnaF ₃ | | <input type="radio"/> Phalanges....I ₇ | <input type="radio"/> Short Bone....N |