Building Up A Human Skeleton

Topic

A study of the human skeleton

Introduction

Forensic scientists must have a detailed knowledge of the human skeleton in order to identify bones. Unlike many mammals, humans stand erect, with their body supported by a vertebral column, at the top of which is the skull. The ribs emerge from the central part of the vertebral column and join together at the sternum at the front, forming a cage that shields vital organs such as the heart and lungs. The shoulder, or pectoral, girdle at the top of the ribs supports the long bones of the arms, while the pelvic girdle, to which the long bones of the legs are attached, is in turn attached to the lower end of the spine and supports most of the body's weight when upright. There are 206 bones in the human body, many of which are very small. Each hand consists of 27 bones (8 carpals, 5 metacarpals, 14 phalanges) and each foot of 26 bones (7 tarsus, 5 metatarsus, 14 phalanges); the skull is made of 29 bones and the vertebral column of 26 bones. The bones of the legs and arms are much larger and are hollow, which makes them both strong and light. It is important to remember this hollow structure if broken bones are discovered. The hollow cavity contains cells that produce red and white blood cells. The structure of these long bones changes with age until the body reaches maturity at about 25 years old. Forensic scientists, therefore, can determine a body's age by examining the long bones. In this experiment, you will form and label a paper skeleton, using "bones" printed on page 8.02–3. Because the bones of the hands and feet are very small, you will not construct these parts of the skeleton.

Time required

30 minutes

Materials

copy of page 8.02–3
glue pen or stick
unlined paper ($8\frac{1}{2} \times 11$)
scissors

Safety note

No experimental work is involved – this is a data response activity.

Procedure

Apply the glue to each part of the skeleton by passing the unprinted side of the "bone" over the surface of the glue stick lightly before pressing it in place on the sheet of paper.

1. Cut out the pieces of "bone" from your copy of page 8.02–3. Only cut out about 3 – 4 pieces of "bone" at a time because the pieces are so small you may lose them. You could also forget which piece is which.
2. Build up the vertebral column; the lowest part is the coccyx, and then the sacrum. The lumbar vertebrae are connected to the sacrum, the thoracic vertebrae to the lumbar vertebrae, and the cranial vertebrae to the thoracic vertebrae. Glue in place in the center of the sheet of paper.
3. Place the cranium at the top of the cranial vertebrae and then place the mandible below the cranium (covering some of the cranial vertebrae). Glue in place.
4. Position the ribs on either side of the thoracic vertebrae. Place the scapulae under the top of the ribs, protruding slightly to the sides. Place each clavicle over the top of a scapula. Place the sternum between the ribs, covering the top few thoracic vertebrae. Position the pelvis around the sacrum. Glue in place.
5. Build up the arms. The humerus is connected to the scapula. The radius and ulnar are positioned between the humerus and the hand. Glue in place.
6. Build up the legs. The femur is connected to the pelvis. The tibia and fibula are positioned between the femur and the foot. Glue in place.

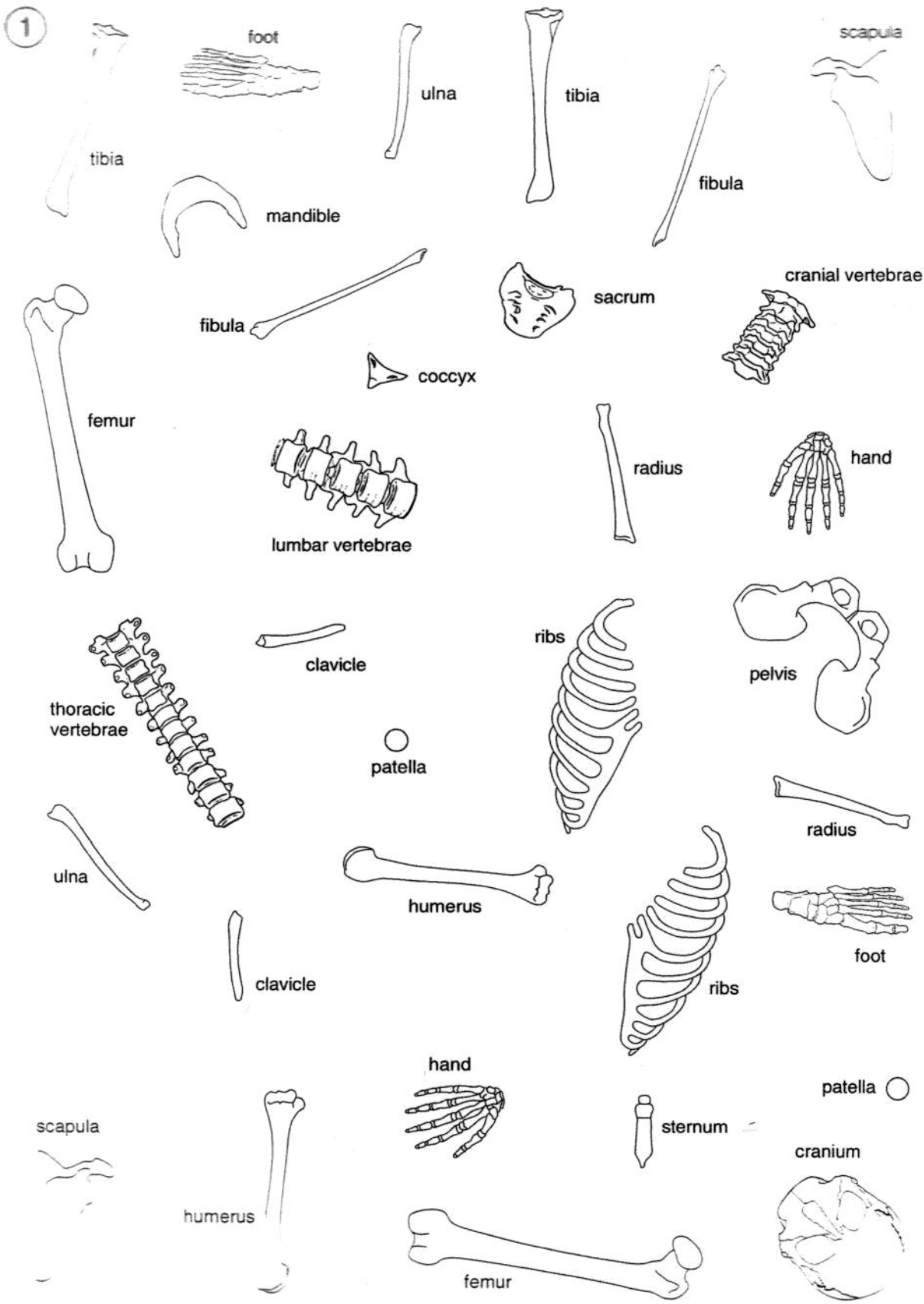
Analysis

1. Label the bones of the skeleton using the names given on page 8.02–3.
2. Consider the names below and, referring to the skeleton you have put together, add the common names for the bones to the data table below.

DATA TABLE	
Clavicle	
Cranium	
Mandible	
Patella	
Scapula	
Sternum	
Vertebral column	

Want to know more?

See Section 10: Our Findings



Parts of the human skeleton