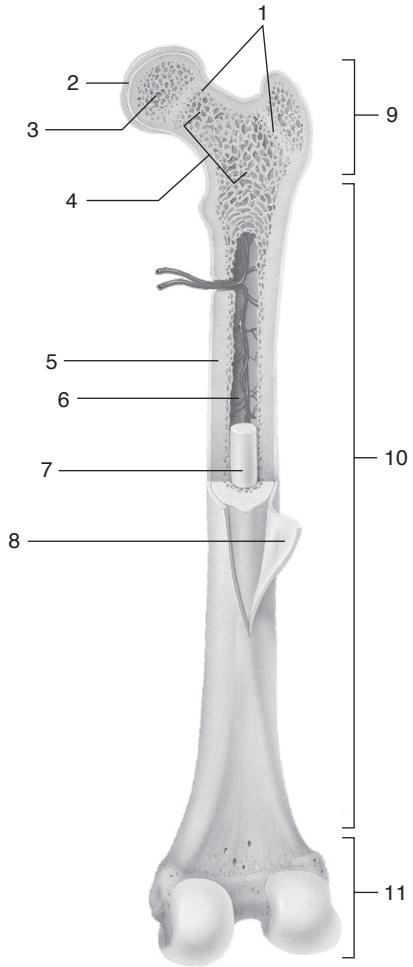
1. Functions of the Skeletal System

List five functions of the skeletal system.

1) **Support**
2) **Protection**
3) **Blood cell production**
4) **Mineral storage**
5) **Attachment sites for skeletal muscles**

2. Bone Structure

a. Label the diagram by placing the number of each structure by the correct label.



2 Articular cartilage
5 Bone, compact
3 Bone, spongy
10 Diaphysis
1 Epiphyseal disk
11 Epiphysis, distal
9 Epiphysis, proximal
4 Marrow, red, in spaces
7 Marrow, yellow
6 Medullary cavity
8 Periosteum

b. Match the terms with the statements.

1) Periosteum
2) Epiphyseal plate
3) Marrow, red
4) Marrow, yellow

3 Fills spaces in spongy bone.
2 Hyaline cartilage.
1 Covers surface of bone.
4 Fills medullary cavity.

3. Microscopic Structure

Match the terms with the statements.

1) Lacunae
2) Lamellae
3) Osteon
4) Osteonic canals
5) Periosteum
6) None of these

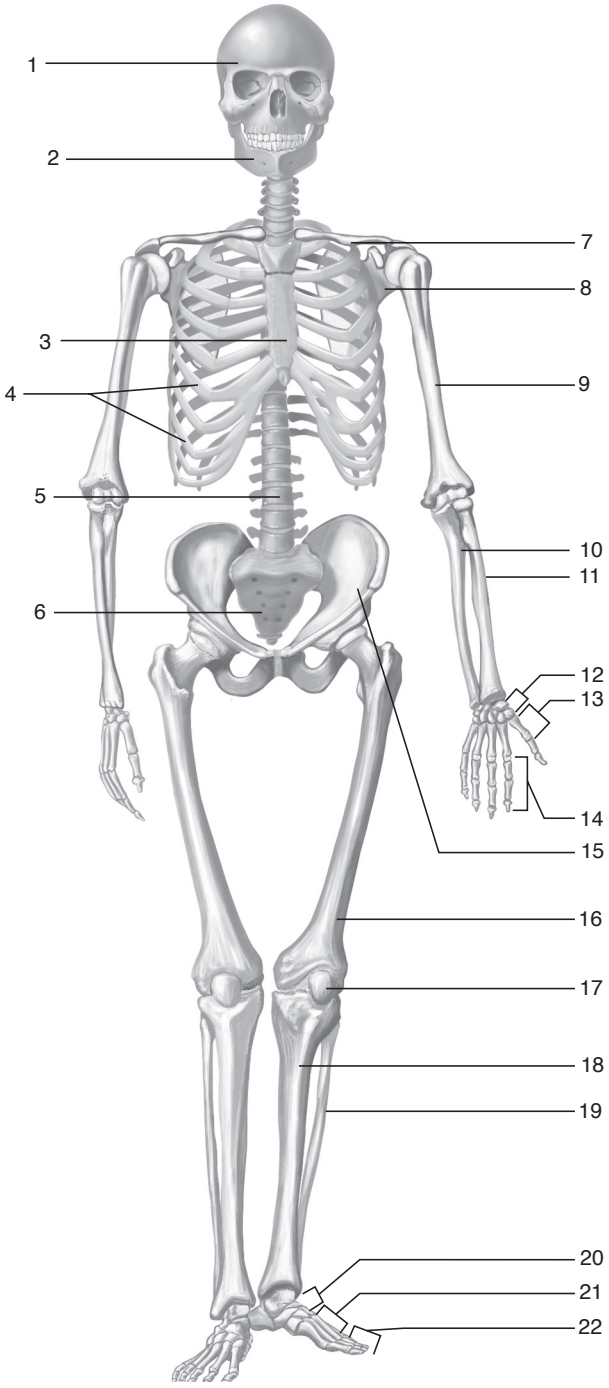
4 Channel for blood vessels and nerves.
1 Spaces containing osteocytes.
2 Concentric layers of compact bone.
5 Source of osteoblasts.
3 Structural unit of compact bone.
6 Spaces containing red marrow.

4. Bone Formation

Write the answers to the statements in the spaces provided.

1) Cells that deposit bone matrix. **Osteoblasts**
2) Cells that remove bone matrix. **Osteoclasts**
3) Cells that occupy the lacunae. **Osteocytes**
4) Site of growth in length of long bones. **Epiphyseal plate**
5) Type of ossification in most skull bones. **Intramembranous**
6) Type of ossification in bones preformed in cartilage. **Endochondral**
7) Cells that hollow out the medullary cavity. **Osteoclasts**

5. Bones of the Skeleton

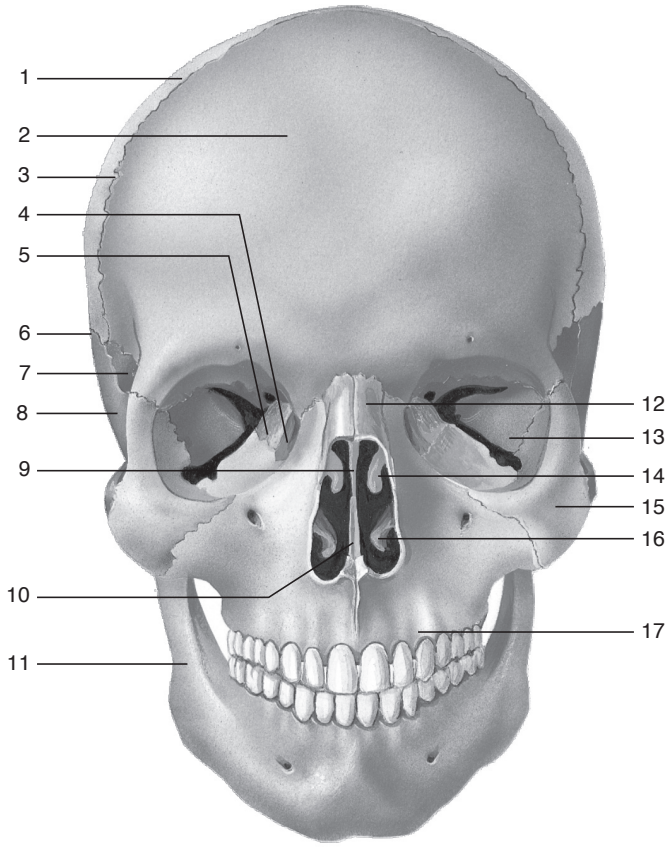


Write the names of the labeled bones in the spaces provided.

1) **Skull**
2) **Mandible**
3) **Sternum**
4) **Ribs**
5) **Vertebral column**
6) **Sacrum**
7) **Clavicle**
8) **Scapula**
9) **Humerus**
10) **Ulna**
11) **Radius**
12) **Carpals**
13) **Metacarpals**
14) **Phalanges**
15) **Coxa**
16) **Femur**
17) **Patella**
18) **Tibia**
19) **Fibula**
20) **Tarsals**
21) **Metatarsals**
22) **Phalanges**

6. The Axial Skeleton

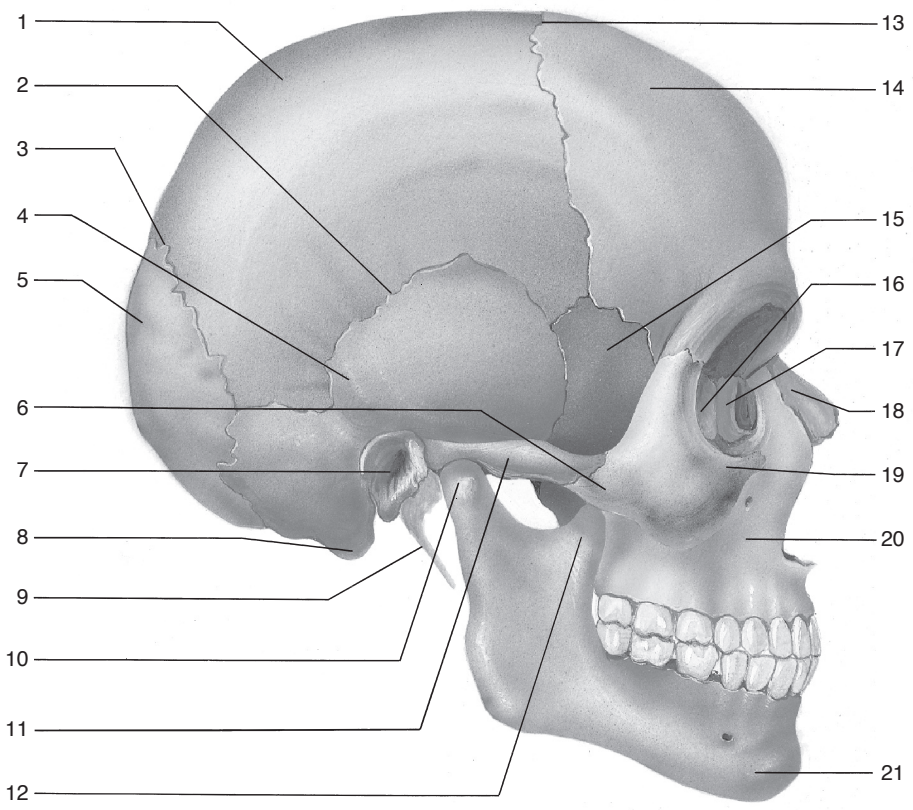
a. Label the diagram of the skull, anterior view, by placing the number of each structure in the space by the correct label.



3	Coronal suture	**16**	Nasal concha, inferior
5	Ethmoid (eye orbit)	**14**	Nasal concha, middle
9	Ethmoid, perpendicular plate	**1**	Parietal
2	Frontal	**6**	Squamosal suture
4	Lacrimal	**7, 13**	Sphenoid (2 places)
11	Mandible	**8**	Temporal
17	Maxilla	**10**	Vomer
12	Nasal	**15**	Zygomatic

b. List the skull bones that contain sinuses. **Ethmoids, Frontal, Maxillae, Sphenoid**

c. Label the diagram of the skull, lateral view, by placing the number of each structure in the space by the correct label.



13 Coronal suture
12 Coronoid process
16 Ethmoid
7 External auditory canal
14 Frontal
17 Lacrimal
3 Lambdoidal suture
21 Mandible
10 Mandibular condyle
8 Mastoid process
20 Maxilla
18 Nasal
5 Occipital
1 Parietal
15 Sphenoid
2 Squamosal suture
9 Styloid process
4 Temporal
11 Temporal, zygomatic process
19 Zygomatic
6 Zygomatic, temporal process

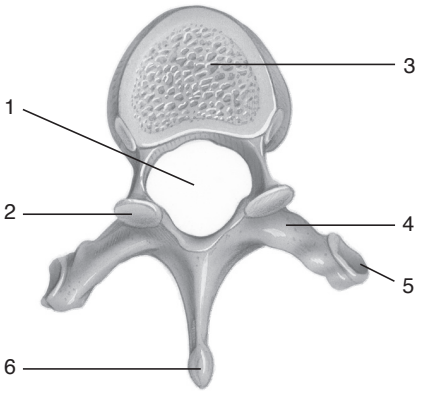
d. Write the terms that match the statements in the spaces provided.

1) Contains the foramen magnum. **Occipital bone**
2) Forms anterior portion of hard palate. **Palatine process of maxilla**
3) Contains external auditory canal. **Temporal bones**
4) The seven vertebrae of the neck. **Cervical vertebrae**
5) Weight-bearing portion of a vertebra. **Body**
6) Foramen through which spinal cord passes. **Vertebral foramen**
7) Vertebrae-bearing ribs. **Thoracic**
8) Number of pairs of true ribs. **Seven (7)**
9) Attaches true ribs to sternum. **Costal cartilages**
10) First cervical vertebra. **Atlas**
11) Cartilaginous pads between vertebrae. **Intervertebral disks**
12) Forms posterior wall of pelvic girdle. **Sacrum**
13) Vertebrae with heaviest bodies. **Lumbar vertebrae**
14) The breastbone. **Sternum**

e. Name the group of bones that provides protection for the

1) Brain **Cranium** 2) Heart and lungs **Thoracic cage**

f. Label the vertebra by placing the number of the structure in the space by the correct label.



__3__ Body
__5__ Facet for rib
__6__ Spinous process
__2__ Superior articular process
__4__ Transverse process
__1__ Vertebral foramen

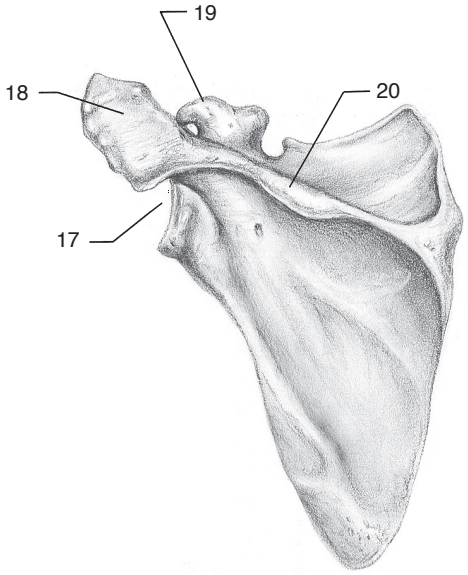
7. The Appendicular Skeleton

a. Write the missing words in the spaces at the right.

The pectoral girdle is formed of two ____1___ and two ____2___ . Its function is to support the upper ____3___ . Each ____4___ articulates with the scapula at one end and the ____5___ at the other. The scapulae are attached to the axial skeleton by ____6___ instead of ligaments.

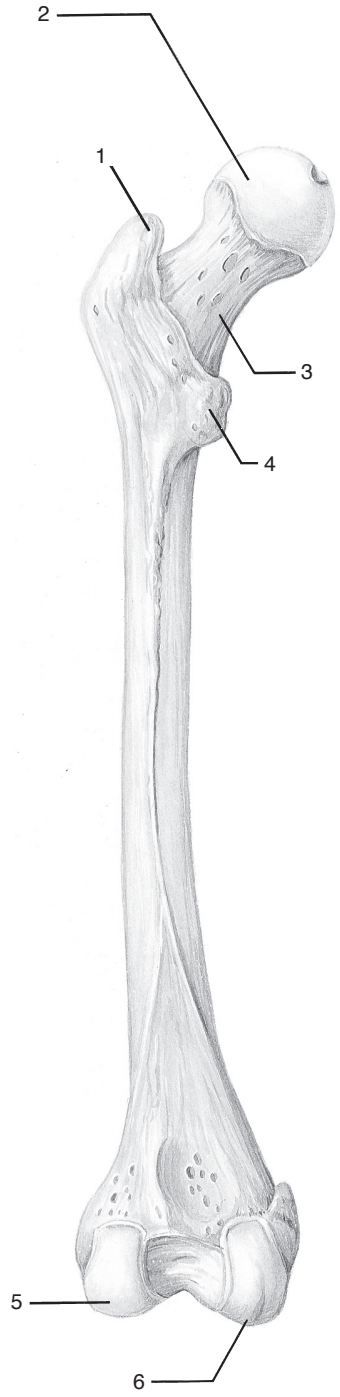
1) **Clavicles**
2) **Scapulae**
3) **Extremities**
4) **Clavicle**
5) **Sternum**
6) **Muscles**

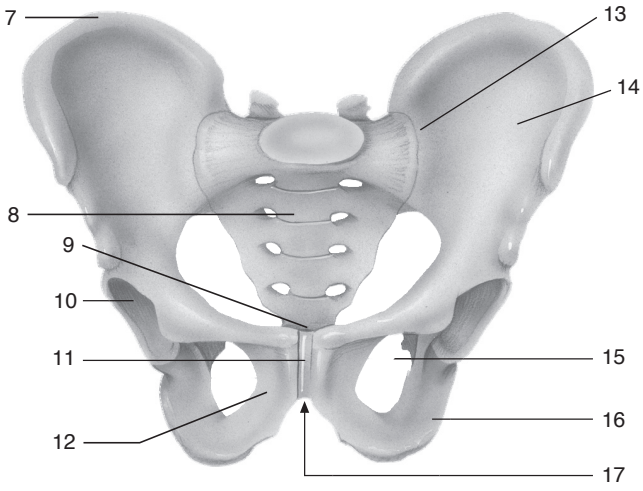
b. Label these diagrams by placing the number of each structure in the space by the correct label.



18 Acromion process
4 Capitulum
19 Coracoid process
10 Coronoid process
17 Glenoid cavity
1 Greater tubercle
5 Head of humerus
11 Head of radius
15 Head of ulna
3 Lateral epicondyle
7 Medial epicondyle
2 Olecranon fossa
14 Olecranon process
12 Radial tuberosity
20 Scapular spine
13 Styloid process, radius
16 Styloid process, ulna
6 Surgical neck
8 Trochlea
9 Trochlear notch

c. Label the diagrams by placing the number of each structure in the space by the correct label.





__10__ Acetabulum
__9__ Coccyx
__1__ Greater trochanter
__2__ Head of femur
__7__ Iliac crest
__14__ Ilium
__16__ Ischium
__5__ Lateral condyle
__4__ Lesser trochanter
__6__ Medial condyle
__3__ Neck of femur
__15__ Obturator foramen
__17__ Pubic arch
__12__ Pubis
__13__ Sacroiliac joint
__8__ Sacrum
__11__ Symphysis pubis

d. Indicate whether each statement is associated with the fibula (F) or tibia (T).

__F__ Lateral malleolus
__T__ Lateral condyle
__T__ Articulates with femur
__T__ Medial malleolus
__T__ Medial condyle
__T, F__ Articulates with talus

8. Articulations

a. Match the type of joint with the articulation formed by the bones.

1) Immovable 3) Ball-and-socket 5) Gliding 7) Pivot
2) Slightly movable 4) Condyloid 6) Hinge 8) Saddle

__6__ Femur—tibia
__1__ Frontal—parietal
__3__ Humerus—scapula
__2__ Vertebra—vertebra
__7__ Atlas—axis
__5__ Carpal—carpal
__8__ Trapezium—metacarpal 1
__3__ Coxa—femur
__1__ Maxilla—zygomatic
__4__ Metacarpal—phalanx

b. Match the terms with the correct definitions.

1) Articular cartilage 3) Cartilage pads 5) Sesamoid bone
2) Bursa 4) Joint capsule 6) Synovial fluid

__6__ Lubricates joints.
__2__ Sacs of synovial fluid.
__3__ Support knee joint and cushion bones.
__1__ Protects articular surfaces of bones.
__5__ Bone embedded in a tendon.
__4__ Formed of ligaments.

c. Match the movements with the descriptions.

1) Abduction 5) Extension 9) Eversion 13) Pronation
2) Adduction 6) Flexion 10) Inversion 14) Supination
3) Depression 7) Dorsiflexion 11) Circumduction 15) Protraction
4) Elevation 8) Plantar flexion 12) Rotation 16) Retraction

__8__ Extension of foot.
__15__ Pushing mandible anteriorly.
__2__ Movement of arm toward midline.
__5__ Straightening arm at elbow.
__14__ Turning palm of hand upward.
__12__ Turning head from side to side.
__6__ Decrease in angle of joint.
__4__ Raising shoulders.
__11__ Drawing circle on chalkboard.
__10__ Turning sole of foot inward.

9. Disorders of the Skeletal System

Write the name of each disorder described in the space provided.

1) Displacement of bones forming a joint. **Dislocation**
2) A lateral curvature of vertebral column. **Scoliosis**
3) Protrusion of intervertebral disk. **Herniated disk**
4) Bone broken into several pieces. **Comminuted fracture**
5) Broken bone pierces through skin. **Compound fracture**
6) Arthritis with invasion of fibrous tissue that calcifies, making joint immovable. **Rheumatoid arthritis**
7) Tearing of ligaments of joint capsule. **Sprain**
8) Severe loss of calcium salts from bones. **Osteoporosis**

10. Clinical Applications 

a. A member of the soccer team is diagnosed with a torn knee cartilage. Would you expect rapid or slow recovery? Explain your answer. **No. Cartilage lacks blood vessels. The reduced supply of nutrients slows the repair process.**

b. Specifically, what is a broken hip? **The femur breaks at the neck.**
Why is it more common among older persons? **Their bones are more brittle and are often weakened by osteoporosis.**