APPENDICULAR SKELETON

Several bones forming part of the upper limb and/or shoulder girdle are shown in Figures 5-8 to 5-11. Follow the specific directions for each figure.

20. Identify the bone in Figure 5-8. Insert your answer in the blank below the illustration. Select different colors for each structure listed below and use them to color the coding circles and the corresponding structures in the diagram. Then, label the angles indicated by leader lines.

- Spine
- Glenoid cavity
- Coracoid process
- Acromion

Superior border
Superior angle
Lateral angle
Lateral border
Medial border
Inferior angle
Posterior scapula-left

Figure 5-8
21. Identify the bones in Figure 5-9 by labeling the leader lines identified as A, B, and C. Color the bones different colors. Using the following terms, complete the illustration by labeling all bone markings provided with leader lines.

- Trochlear notch
- Trochlea
- Radial tuberosity
- Head (three)
- Styloid process
- Capitulum
- Deltoid tuberosity
- Greater tubercle
- Trochlear notch
- Coronoid process
- Olecranon process
- Lesser tubercle
- Figure 5-9
22. Figure 5-10 is a diagram of the hand. Select different colors for the following structures, and use them to color the coding circles and the corresponding structures in the diagram.

- Carpals
- Metacarpals
- Phalanges

![Figure 5-10]

23. Compare the pectoral and pelvic girdles by choosing descriptive terms from the key choices. Insert the appropriate key letters in the answer blanks.

**Key Choices**

A. Flexibility  
B. Massive  
C. Lightweight  
D. Shallow socket for limb attachment  
E. Deep, secure socket for limb attachment  
F. Weight-bearing

Pectoral:  
Pelvic:  

A. C. D.  
B. E. F.
24. Using the key choices, identify the bone names or markings according to the descriptions that follow. Insert the appropriate term or letter in the answer blanks.

**Key Choices**

A. Acromion
B. Capitulum
C. Carpals
D. Clavicle
E. Coracoid process
F. Coracoid fossa
G. Deltoid tuberosity
H. Glenoid cavity
I. Humerus
J. Metacarpals
K. Olecranon fossa
L. Olecranon process
M. Phalanges
N. Radial tuberosity
O. Radius
P. Scapula
Q. Sternum
R. Styloid process
S. Trochlea
T. Ulna

1. Raised area on lateral surface of humerus to which deltoid muscle attaches
2. Arm bone
3. Bones composing the shoulder girdle
4. Forearm bones
5. Point where scapula and clavicle connect
6. Shoulder girdle bone that has no attachment to the axial skeleton
7. Shoulder girdle bone that articulates anteriorly with the sternum
8. Socket in the scapula for the arm bone
9. Process above the glenoid cavity that permits muscle attachment
10. Commonly called the collarbone
11. Distal medial process of the humerus; joins the ulna
12. Medial bone of the forearm in anatomical position
13. Rounded knob on the humerus that articulates with the radius
14. Anterior depression; superior to the trochlea; receives part of the ulna when the forearm is flexed
15. Forearm bone involved in formation of elbow joint
16. Bones that articulate with the clavicle
17. Bones of the wrist
18. Bones of the fingers
19. Heads of these bones form the knuckles
25. Figure 5–11 is a diagram of the articulated pelvis. Identify the bones and bone markings indicated by leader lines on the figure. Select different colors for the structures listed below and use them to color the coding circles and the corresponding structures in the figure. Also, label the dashed line showing the dimensions of the true pelvis and that showing the diameter of the false pelvis. Complete the illustration by labeling the following bone markings: obturator foramen, iliac crest, anterior superior iliac spine, ischial spine, pubic ramus, and pelvic brim. Last, list three ways in which the female pelvis differs from the male pelvis and insert your answers in the answer blanks.

- Coxa bone
- Pubic symphysis
- Sacrum
- Acetabulum

- Iliac Crest
- False Pelvis
- True Pelvis
- Anterior Superior Iliac Spine
- Ischial Spine
- Pubic Ramus
- Obturator Foramen

![Figure 5-11](image)

1. Female Inlet is large and more circular
2. Female Sacrum is less curved, Pubic arch is broader
3. Female Iliac Spines are shorter; pelvis is shallower

26. Circle the term that does not belong in each of the following groupings.

1. Tibia  |  Ulna  |  Fibula  |  Femur  |  Pelvis
2. Skull  |  Rib cage  |  Vertebral column  |  Ilium  |  Pubis
3. Ischium  |  Scapula  |  |  |  
4. Mandible  |  Frontal bone  |  Temporal bone  |  Occipital bone
5. Calcaneus  |  Tarsals  |  |  Carpals  |  Talus
27. Using the key choices, identify the bone names and markings, according to the descriptions that follow. Insert the appropriate key term(s) or letter(s) in the answer blanks.

Key Choices

A. Acetabulum
B. Calcaneus
C. Femur
D. Fibula
E. Gluteal tuberosity
F. Greater sciatic notch
G. Greater and lesser trochanters
H. Iliac crest

I. Ilium
J. Ischial tuberosity
K. Ischium
L. Lateral malleolus
M. Lesser sciatic notch
N. Medial malleolus
O. Metatarsals
P. Obturator foramen
Q. Patella
R. Pubic symphysis
S. Pubis
T. Sacroiliac joint
U. Talus
V. Tarsals
W. Tibia
X. Tibial tuberosity

1. Fuse to form the coxal bone (hip bone)
2. Receives the weight of the body when sitting
3. Point where the coxal bones join anteriorly
4. Upper margin of iliac bones
5. Deep socket in the hip bone that receives the head of the thigh bone
6. Point where the axial skeleton attaches to the pelvic girdle
7. Longest bone in body; articulates with the coxal bone
8. Lateral bone of the leg
9. Medial bone of the leg
10. Bones forming the knee joint
11. Point where the patellar ligament attaches
12. Kneecap
13. Shinbone
14. Distal process on medial tibial surface
15. Process forming the outer ankle
16. Heel bone
28. For each of the following statements that is true, insert T in the answer blank.

1. The pectoral girdle is formed by the articulation of the hip bones and the sacrum.

2. Bones present in both the hand and the foot are carpals.

3. The tough, fibrous connective tissue covering of a bone is the periosteum.

4. The point of fusion of the three bones forming a coxal bone is the glenoid cavity.

5. The large nerve that must be avoided when giving injections into the buttock muscles is the femoral nerve.

6. The long bones of a fetus are constructed of hyaline cartilage.

7. Bones that provide the most protection to the abdominal viscera are the ribs.

8. The largest foramen in the skull is the foramen magnum.

9. The intercondylar fossa, greater trochanter, and tibial tuberosity are all bone markings of the humerus.

10. The first major event of fracture healing is hematoma formation.

11. An exaggerated thoracic curvature known as "dowager's hump" is an abnormal condition called scoliosis.
29. The bones of the thigh and the leg are shown in Figure 5-12. Identify each and put your answers in the blanks labeled A, B, and C. Select different colors for the lower limb bones listed below and use them to color in the coding circles and corresponding bones on the diagram. Complete the illustration by inserting the terms indicating bone markings at the ends of the appropriate leader lines in the figure.

- **Femur**: Head of femur, Intercondylar eminence, Tibial tuberosity
- **Tibia**: Anterior border of tibia, Lesser trochanter, Greater trochanter
- **Fibula**: Head of fibula, Medial malleolus, Lateral malleolus

![Figure 5-12](image)
30. Figure 5-13 is a diagram of the articulated skeleton. Identify all bones or groups of bones by writing the correct labels at the end of the leader lines. Then, select two different colors for the bones of the axial and appendicular skeletons and use them to color in the coding circles and corresponding structures in the diagram.

Axial skeleton

- Parietal
- Occipital
- Clavicle
- Scapula
- Humerus
- Vertebra

Appendicular skeleton

- Frontal
- Maxilla
- Mandible
- Sternum
- Rib
- Radius
- Ulna
- Carpals
- Metacarpals
- Phalanges
- Tibia
- Fibula
- Talus
- Metatarsals
- Phalanges

Figure 5-13
BONE FRACTURES

31. Using the key choices, identify the fracture (Fx) types shown in Figure 5-14 and the fracture types and treatments described below. Enter the appropriate key letter or term in each answer blank.

Key Choices
A. Closed reduction
B. Compression fracture
C. Compound fracture
D. Depressed fracture
E. Greenstick fracture
F. Open reduction
G. Simple fracture
H. Spiral fracture

1. Bone is broken cleanly; the ends do not penetrate the skin
   G
2. Nonsurgical realignment of broken bone ends and splinting of bone
   A
3. A break common in children; bone splinters, but break is incomplete
   E
4. A fracture in which the bone is crushed, common in the vertebral column
   B
5. A fracture in which the bone ends penetrate through the skin surface
   C
6. Surgical realignment of broken bone ends
   F
7. A result of twisting forces
   H

Figure 5-14
32. For each of the following statements that is true about bone breakage and the repair process, insert *T* in the answer blank. For false statements, correct the underlined terms by inserting the correct term in the answer blank.

1. A **hematoma** usually forms at a fracture site.

2. Deprived of nutrition, **osteoclasts** at the fracture site die.

3. Nonony debris at the fracture site is removed by **osteoclasts**.

4. Growth of a new capillary supply into the region produces **granulation tissue**.

5. Osteoblasts from the **medullary cavity** migrate to the fracture site.

6. The **fibrocartilage callus** is the first repair mass to splint the broken bone.

7. The bony callus is initially composed of **compact** bone.

**JOINTS**

33. Figure 5-15 shows the structure of a typical diarthrotic joint. Select different colors to identify each of the following areas and use them to color the coding circles and the corresponding structures on the figure. Then, complete the statements below the figure.

- Articular cartilage of bone ends
- Fibrous capsule
- Synovial membrane
- Joint cavity

![Figure 5-15](image)

1. **Synovial fluid** The lubricant that minimizes friction and abrasion of joint surfaces is *(1)*.

2. **Articular cartilage** The resilient substance that keeps bone ends from crushing when compressed is *(2)*.

3. **Ligaments** *(3)*, which reinforce the fibrous capsule, help to prevent dislocation of the joint.
34. For each joint described below, select an answer from Key A. Then, if the Key A selection is other than C (a synovial joint), see if you can classify the joint further by making a choice from Key B.

Key Choices

Key A:  
A. Cartilaginous  
B. Fibrous  
C. Synovial

Key B:  
1. Epiphyseal disk  
2. Suture  
3. Symphysis

A  1. Has amphiarthritic and synarthrotic examples

C  2. All have a fibrous capsule lined with synovial membrane surrounding a joint cavity

B, 2  3. Bone regions united by fibrous connective tissue

B, 2  4. Joints between skull bones

C  5. Joint between the atlas and axis

C  6. Hip, elbow, and knee

C  7. All examples are diarthroses

A, 3  8. Pubic symphysis

C  9. All are reinforced by ligaments

B, 2  10. Joint providing the most protection to underlying structures

C  11. Often contains a fluid-filled cushion

A, 1  12. Child's long-bone growth plate made of hyaline cartilage

C  13. Most joints of the limbs

C  14. Often associated with bursae

C  15. Have the greatest mobility

35. Which structural joint type is not commonly found in the axial skeleton and why not?

*Synovial or Diarthrotic joints, since the axial skeleton is more for support and protection, it is less concerned with joint mobility.*
Homeostatic Imbalances of Bones and Joints

36. For each of the following statements that is true, enter T in the answer blank. For each false statement, correct the underlined words by writing the correct words in the answer blank.

1. In a sprain, the ligaments reinforcing a joint are excessively stretched or torn. **T**

2. Age-related erosion of articular cartilages and formation of painful bony spurs are characteristic of gouty arthritis. **Acute Osteoarthritis**

3. Chronic arthritis usually results from bacterial invasion. **Chronic Gouty Arthritis**

4. Healing of a partially torn ligament is slow because its hundreds of fibrous strands are poorly aligned. **T**

5. Rheumatoid arthritis is an autoimmune disease. **Rheumatoid Arthritis**

6. High levels of uric acid in the blood may lead to rheumatoid arthritis. **Gouty Arthritis**

7. A "soft" bone condition in children, usually caused by a lack of calcium or vitamin D in the diet, is called osteomyelitis. **T**

8. Atrophy and thinning of bone owing to hormonal changes or inactivity (generally in the elderly) is called osteoporosis. **T**

DEVELOPMENTAL ASPECTS OF THE SKELETON

37. Using the key choices, identify the body systems that relate to bone tissue viability. Enter the appropriate key terms or letters in the answer blanks.

**Key Choices**

A. Endocrine  
B. Integumentary  
C. Muscular  
D. Nervous  
E. Reproductive  
F. Urinary

1. Conveys the sense of pain in bone and joints  **D**

2. Activates vitamin D for proper calcium usage  **A**

3. Regulates uptake and release of calcium by bones  **C**

4. Increases bone strength and viability by pulling action  **A**

5. Influences skeleton proportions and adolescent growth of long bones  **B**

6. Provides vitamin D for proper calcium absorption  **A**