

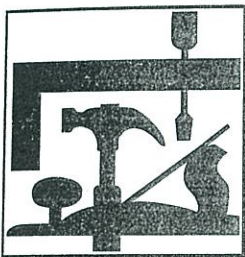
H x/64
CP x/29

Joints are structures that connect adjoining bones. Except for the hyoid bone, and sesamoid bones like the patella, each bone contacts at least one other bone at a joint. A typical joint includes the adjacent surfaces of the bones and the fibrous tissue or ligaments that bind the bones together. In addition to binding the bones together, joints provide the skeleton with the flexibility to permit body movements.

Since joints vary in structure and range of motion, it is convenient to classify them on the basis of their structure (fibrous, cartilaginous, or synovial) and function (the degree of joint movement).

Topics for review in Chapter 8 include the classifications of joints, the structures of selected synovial joints, joint impairment, and the changes in the joints throughout life.

Answer Key



BUILDING THE FRAMEWORK

Classification of Joints

1. Write your answers to the following questions in the answer blanks.

1. What are the two major functions of joints? to bind bones together and allow movement.

2. List three criteria used to classify joints. Type of material, joint cavity present or not and the degree of movement the joint allows.

3. For each of the structural joint categories—fibrous, cartilaginous, and synovial—give the most common functional classification, and describe the degree of movement.

Fibrous: synarthrosis, immovable

Cartilaginous: amphiarthrosis, slightly movable

Synovial: diarthrosis, freely movable

2pts each

Honor
EC-CP

Extra Credit for CP

Fibrous, Cartilaginous, and Synovial Joints

1. For each joint described below, select an answer from Key A. Then, if the Key A selection is *other than C* (synovial joint), classify the joint further by making a choice from Key B.

- KEY A:**
- A. Cartilaginous
 - B. Fibrous
 - C. Synovial

- KEY B:**
- 1. Gomphosis
 - 2. Suture
 - 3. Symphysis
 - 4. Syndesmosis
 - 5. Synchondrosis
 - 6. Synostosis

A, 5 1. Characterized by hyaline cartilage connecting the bony portions

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

B, 1, 2, 4, 6 3. Bone regions united by fibrous connective tissue

B, 2, 6 4. Joints between skull bones

C 5. Joint between atlas and axis

C 6. Hip, elbow, knee, and intercarpal joints

A, 3 7. Intervertebral joints (between vertebral bodies)

A, 3 8. Pubic symphysis

C 9. All are reinforced by ligaments

C 10. Costosternal joints 2 through 7

B, 6 11. Joint providing the most protection to underlying structures

C 12. Often contains a fluid-filled cushion

A, 5 13. Child's epiphyseal plate made of hyaline cartilage

C 14. Most joints of the limbs

B, 1 15. Teeth in body alveolar sockets

A, 5 16. Joint between first rib and manubrium of sternum

B, 6 17. Ossified sutures

B, 4 18. Distal tibiofibular joint

2. Which structural joint type is *not* commonly found in the axial skeleton and

why not? Synovial - they provide mobility/flexibility
The Axial Skeleton what to be only slightly
or immovable to provide support + protection
to the organs.

H
1 pt
each
CP 1/2 EC
MAX +5

CP +
H
must
answer

20 H

3. Figure 8.1 shows the structure of a typical synovial joint. Select different colors to identify and color the following areas. Then label the following: proximal epiphyseal line, distal epiphyseal line, spongy bone, periosteum.

2pts

CP + H
5pts total

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

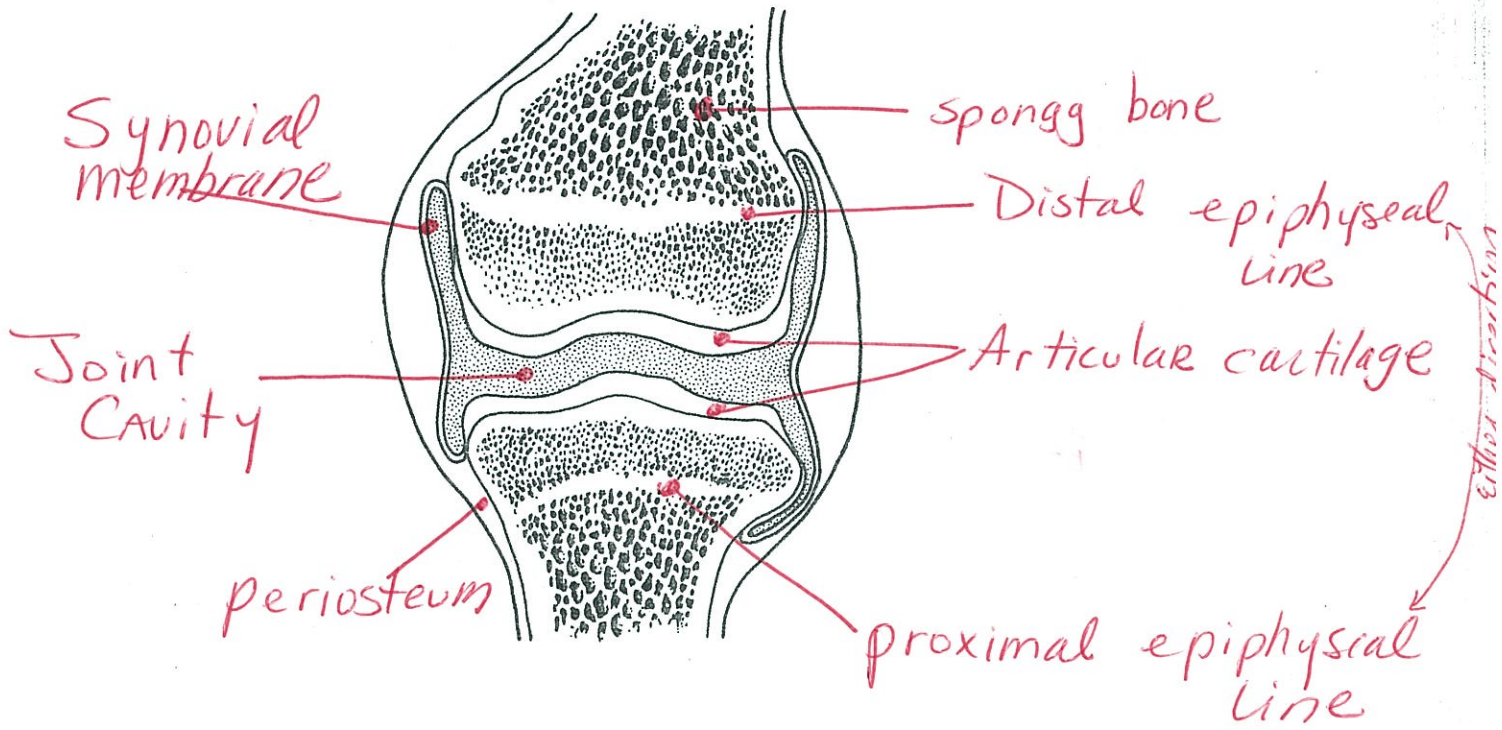


Figure 8.1

4. Match the body movement terms in column B with the appropriate description in column A. (More than one choice may apply.)

Column A	Column B
<u>I</u>	1. Movement along the sagittal plane that decreases the angle between two bones
<u>A</u>	2. Movement along the frontal plane, away from the body midline; raising the arm laterally
<u>P</u>	3. Circular movement around the longitudinal bone axis; shaking the head "no"
<u>J</u>	4. Slight displacement or slipping of bones, as might occur between the carpals of the wrist
<u>C</u>	5. Describing a cone-shaped pathway with the arm
<u>F</u>	6. Lifting or raising a body part; shrugging the shoulders
<u>Q</u>	7. Moving the hand into a palm-up (or forward) position
<u>E</u>	8. Movement of the superior aspect of the foot toward the leg; standing on one's heels
<u>K</u>	9. Turning the sole of the foot medially
<u>N</u>	10. Movement of a body part anteriorly; jutting the lower jaw forward
<u>A, B, C, H, I</u>	11. Common angular movements

5. Figure 8.2 illustrates types of movements allowed by synovial joints. Match the letters on the figure with the types of movements listed below. Insert your answers in the answer blanks. Then color the drawing to suit your fancy.

<u>A, C, E</u>	1. Flexion	<u>M</u>	6. Protraction
<u>G</u>	2. Plantarflexion	<u>F</u>	7. Circumduction
<u>D, I</u>	3. Abduction	<u>K</u>	8. Adduction
<u>N</u>	4. Rotation	<u>B, L</u>	9. Extension
<u>J</u>	5. Pronation	<u>H</u>	10. Dorsiflexion

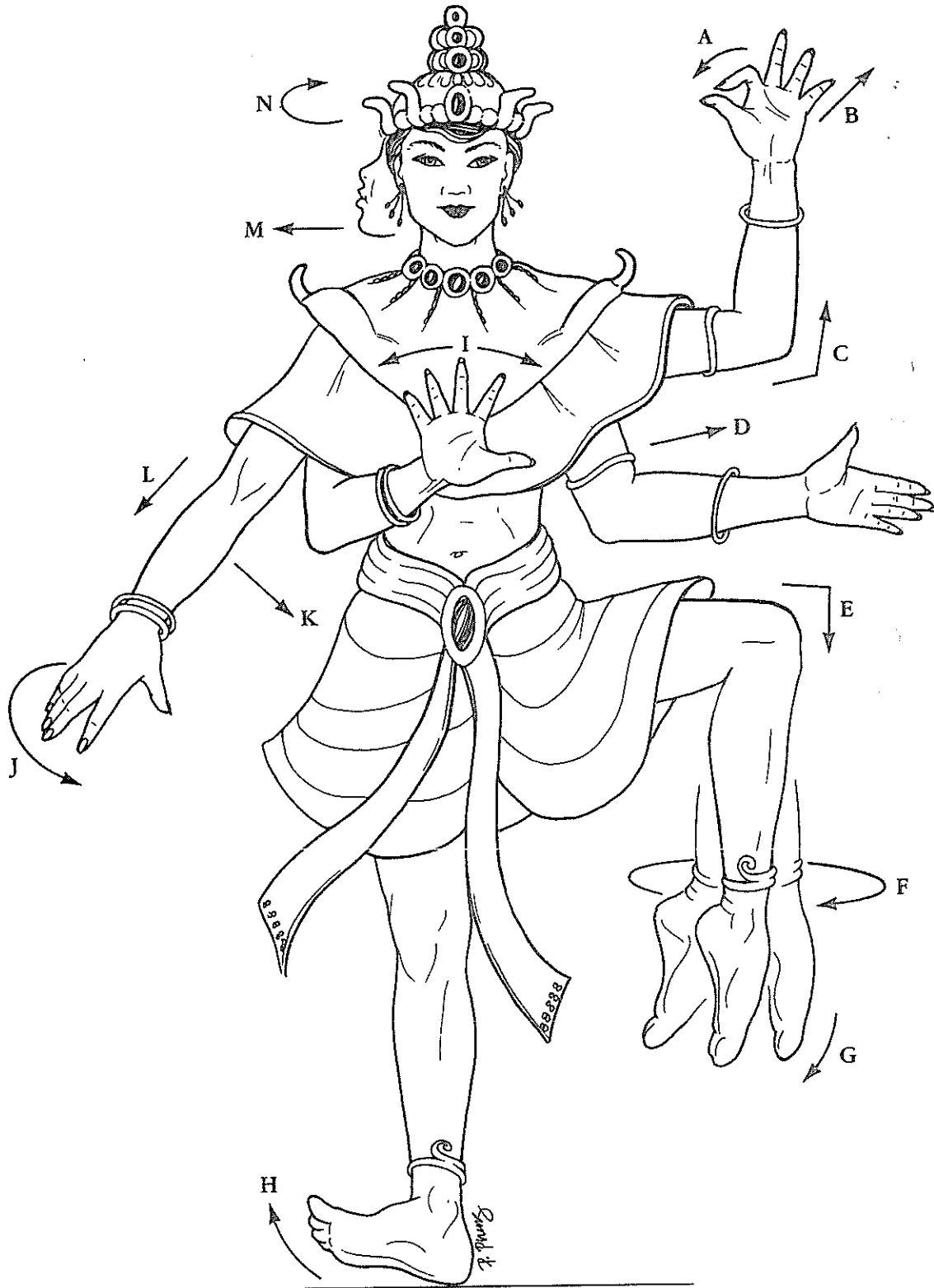


Figure 8.2

6. Match the joint types in column B with the examples or descriptions of joints listed in column A.

	Column A	Column B
<u>B</u>	1. Knuckles	A. Ball and socket
<u>E</u>	2. Sacroiliac joints	B. Condylloid
<u>E</u>	3. Intercarpal joints	C. Hinge
<u>E</u>	4. Femoropatellar joint of the knee	D. Pivot
<u>A</u>	5. Hip and shoulder joints	E. Plane
<u>B</u>	6. Radiocarpal	F. Saddle
<u>E</u>	7. Proximal tibiofibular joint	G. Synchondrosis
<u>F</u>	8. Carpometacarpal joint of the thumb	
<u>C</u>	9. Elbow, knee, and interphalangeal joints	
<u>D</u>	10. Joint between C ₁ and C ₂	
<u>C, D</u>	11. Uniaxial joints	
<u>B, F</u>	12. Biaxial joints	
<u>A</u>	13. Multiaxial joints	
<u>E</u>	14. Nonaxial joints	

7 pts

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

- Pivot joint Uniaxial joint Multiaxial joint Atlas/axis joint
- Ball and socket joint Multiaxial joint Hip joint Saddle joint
- Tibiofibular joints Sutures Synostoses Gomphoses
- Articular discs Multiaxial joint Largest joint in the body Knee joint
- Saddle joint Carpometacarpal joint of thumb Elbow joint Biaxial joint
- Amphiarthrotic Intercarpal joints Plane joints Nonaxial joints
- Intervertebral joints Bursae Cartilaginous joints Symphyses
- Hinge joint Condylloid joint Elbow joint Uniaxial joint
- Muscle tendon reinforcement Shoulder joint Biaxial joint
- Most freely moving joint in the body

Honors

Bonus for All

MAX + 3
all correct
3 correct = 1 EC pt

Honors

8. Several characteristics of specific synovial joints are described below. Identify each of the joints described by choosing a response from the key choices.

KEY CHOICES

- A. Elbow B. Hip C. Knee D. Shoulder

- D 1. Rotator cuff muscles are important in stabilizing this joint; capsule reinforced only anteriorly by ligaments; articular surfaces shallow.
- C 2. Three joints in one; capsule incomplete anteriorly; has menisci and intracapsular cruciate ligaments.
- A 3. Capsule is loose; reinforced by medial and lateral collateral ligaments; articular surfaces most important in ensuring joint stability.
- B 4. Articular surfaces deep and secure; capsule heavily reinforced by ligaments and muscle tendons; intracapsular ligamentum teres. Extremely stable joint.

2 pts

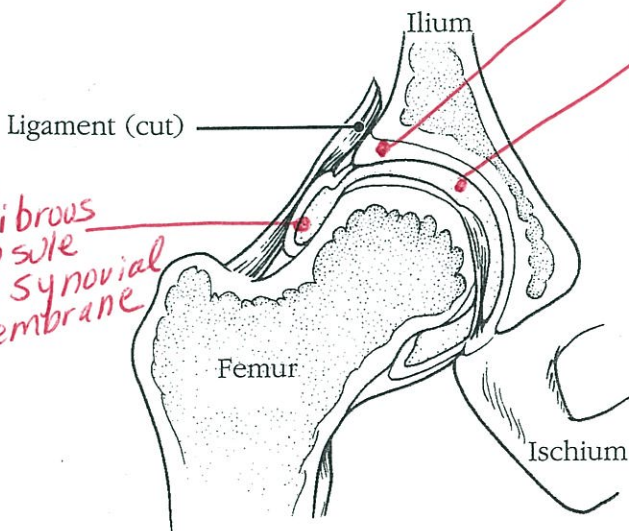
9. Figure 8.3 shows diagrams of two synovial joints. Identify each joint by inserting the name of the joint in the blank below each diagram. Then select different colors, and use them to color the coding circles and the structures that are present in the diagrams. Finally, add labels and leader lines on the diagrams to identify the following structures: the ligamentum teres, the anterior cruciate ligament, the posterior cruciate ligament, the suprapatellar bursa, the subcutaneous prepatellar bursa, and the deep infrapatellar bursa.

6 pts total

6 labels (3 pts)

2 pts

- Fibrous capsule (lined with synovial membrane) Joint cavity
- Articular cartilage of bone ends Acetabular labrum

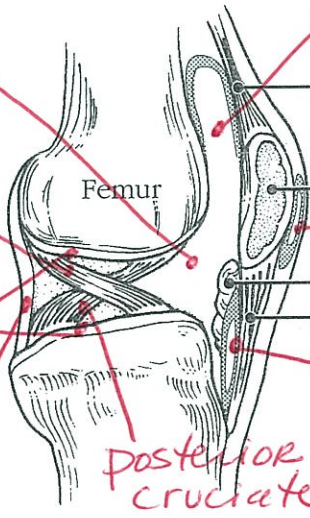


Fibrous capsule w/ synovial membrane

Joint cavity

Anterior cruciate Lig.

Anterior Cartilage



Suprapatellar bursa

patellar bursa

Fat pad

Ligament

infrapatellar Bursa

posterior cruciate ligament

fibrous capsule w/ synovial membrane

1/2 pt each

A. Hip Joint

B. Knee Joint

Figure 8.3

8 pts

Homeostatic Imbalances of Joints

1. For any of the following statements that are true, insert T in the answer blanks. For false statements, correct the underlined words, and insert your correction in the answer blank.

- dislocation 1. The term arthritis means that bone ends are forced out of their normal positions in a joint cavity.
- TRUE 2. In a sprain, the ligaments reinforcing a joint are excessively stretched or torn.
- Osteoarthritis 3. Erosion of articular cartilages and formation of painful bony spurs are characteristic of gouty arthritis.
- bursa 4. "Housemaid's knee" is an example of inflammation of the tendon sheaths.
- acute 5. Chronic arthritis usually results from bacterial invasion.
- vascularized 6. Healing of a partially torn ligament is slow because its hundreds of fibrous strands are poorly aligned.
- rheumatoid Arth 7. Acute arthritis is an autoimmune disease.
- gouty Arth. 8. Hyperuricemia may lead to rheumatoid arthritis.
- TRUE 9. Torn menisci of the knee rarely heal because cartilage is avascular.
- Synovial memb. 10. In rheumatoid arthritis, the initial pathology is inflammation of the bursae.
- rheumatoid Arth 11. Gouty arthritis involves several joints that are affected in a bilateral manner.
- menisci 12. Most cartilage injuries of the knee involve torn ligaments.
- reduced friction 13. The function of the bursae is to absorb the shock between bony structures in a joint.
- Osteoarthritis 14. The most common form of chronic arthritis is rheumatoid arthritis.
- synovial 15. The local swelling seen in bursitis is caused by excessive production of plasma fluid.