

1. What are the major organs/structures that comprise the skeletal system?
Bones, Joints, Cartilages, and ligaments.
2. What are the five major functions of the skeletal system?
Support, organ protection, storage of fats and minerals, hematopoiesis (blood cell formation), and movement
3. There are the four major bone types/shapes, describe each one, and give one example of each.
Long Bones (humerus, femur, etc.); Short Bones (carpals and tarsals), Irregular Bones (vertebrae), and Flat Bones (Bones of skull like frontal, occipital, parietal, etc.)
4. What are the two subdivisions of the human skeleton called and what parts of the body are included in each?
Axial Skeleton – Bones of skull and face, vertebral column, and bony thorax (rib cage, sternum)
Appendicular Skeleton – Bones of shoulder girdles, pelvic girdles, and all appendages like arms and legs
5. What are the two types of bone tissue? Which type of bone marrow is present in each (in adults)?
Spongy Bone – small, needle-like projections throughout; where red marrow makes red blood cells, in epiphyses covered by articular cartilage
Compact Bone – Dense, Homogenous tissue that has a cavity in its center called the medullary cavity where yellow marrow stores fats and minerals, in the diaphysis covered by periosteum
6. What is the function of red marrow? **Makes various blood cells; especially red blood cells**
7. What is the function of yellow marrow? **Stores fats (lipids) and minerals; found mostly in adults.**
8. The ends of long bones are called epiphyses
9. The hollow shaft of a long bones are called diaphysis
10. The outside of the epiphysis is covered mostly by what type of tissue? **Articular Cartilage (a form of hyaline)**
11. The outside of the diaphysis is covered mostly by what? **Periosteum**
12. **D** The most important minerals stored in bones are:
 - A. calcium and iron
 - B. sodium and phosphorus
 - C. sodium and potassium
 - D. calcium and phosphorus
 - E. calcium and potassium
13. **A** An example of a ball and socket joint is a:
 - a. hip
 - b. knee
 - c. elbow
 - d. wrist
14. **C** An example of a hinge joint is a:
 - a. hip
 - b. knee
 - c. elbow
 - d. wrist

15. C An example of a pivot joint is the:

- a. hip
- b. finger
- c. elbow
- d. knee

16. What are the four stages of bone healing? Briefly explain what happens during each stage.

Hematoma (blood-filled swelling) is formed because of the rupture of blood vessels during the fracture.

The break is then splinted by a fibrocartilage callus made of cartilage matrix, bone matrix, and collagen fibers; growth of some new capillaries to bring blood to the affected areas; the tissue starts to repair itself.

The cartilage is replaced by bone to form a bony callus. Osteoblasts and osteoclasts migrate to the affected area and multiply to help replace bone tissue and to get ready for bone remodeling.

Over the next few months, the bony callus is remodeled by the osteoblasts and osteoclasts; this process is in response to the different mechanical stress placed on the bone. A permanent patch is then formed.

17. Spongy bone is mostly found in what part of long bones? Epiphyses

18. Compact bone is mostly found in what part of long bones? Diaphysis

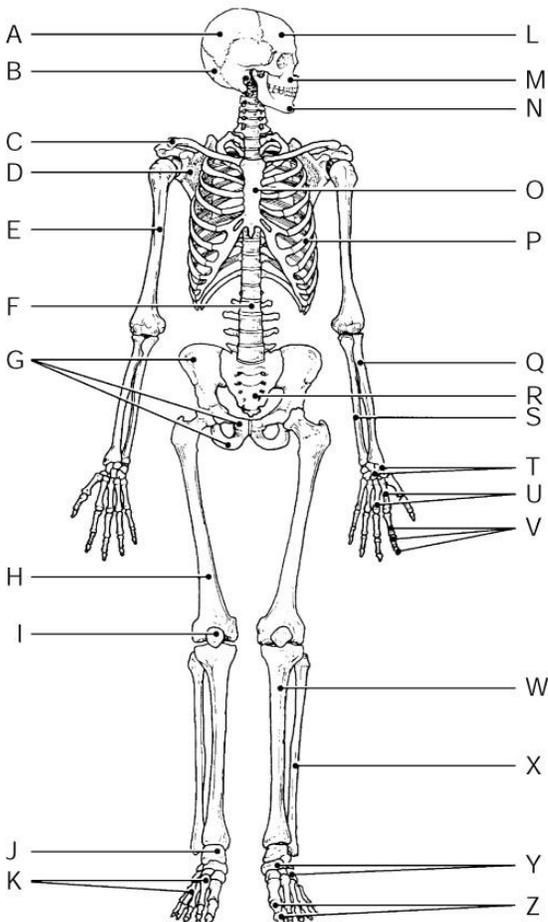
19. Osteocytes or bone cells are housed in which part of the osteon? Lacunae

20. Bone cells that add/build new bone tissue are called what? Osteoblasts

21. Bone cells that remove old bone tissue and break it down are called what? Osteoclasts

22. The rings of an osteon, much like tree rings, are called Lamellae.

23. The pelvis is part of which division of the human skeleton? axial or **appendicular** (circle one)



Using Figure to the left, identify the following:

24. The frontal bone is indicated by letter L.

25. The femur is indicated by letter H.

26. The fibula is indicated by letter X.

27. The sternum is indicated by letter O.

28. The radius bone is indicated by letter Q.

29. The mandible is indicated by letter N.

30. The scapula is indicated by letter D.

31. The phalanges of the foot are indicated by letter Z.

32. The sacrum is indicated by letter R.

33. The maxilla is indicated by letter M.

34. Letter E is what bone? Humerus.

35. Letter I is what bone? Patella.

36. Letter W is what bone? Tibia.

37. Examples of short bones could be which letters? J, Y, T

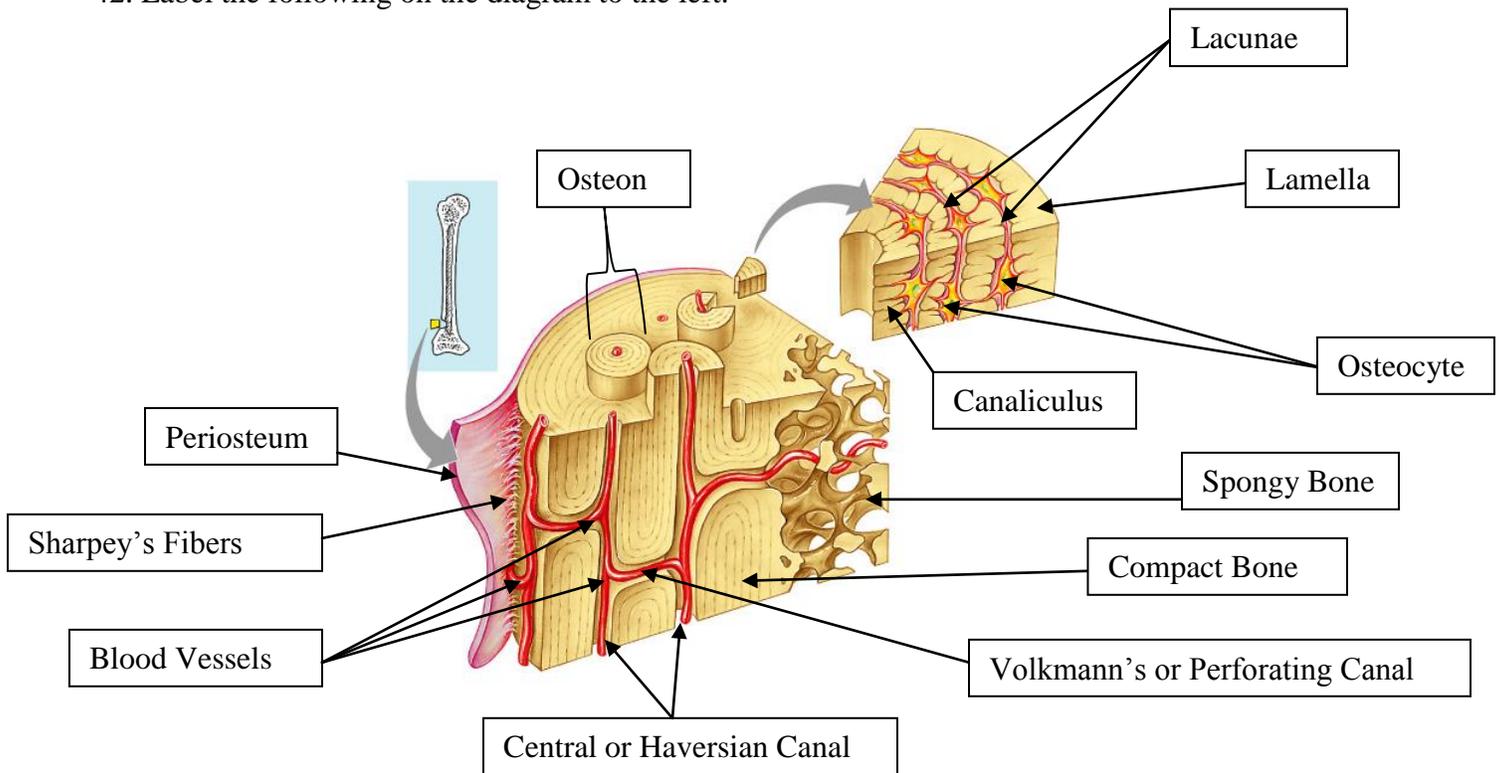
38. What are the three bones called represented by letter G?
Ilium, Ischium, Pubic Bone (Pelvis/Coxal)

39. The occipital bone is indicated by letter B.

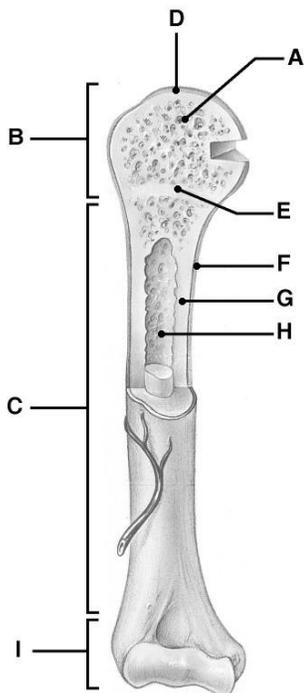
40. Is letter P pointing to a true, false, or floating rib?
False

41. Letter U represents what bones?
Metacarpals

42. Label the following on the diagram to the left.



Use the diagram to the left to answer the questions below.



43. What letter represents where red marrow would be found? **A**

44. Letter B is an example of a proximal **Epiphysis**

45. The diaphysis is indicated by which letter? **C**

46. Yellow marrow would be located in the area of which letter? **H**

47. F represents what type of tissue? **Periosteum**

48. Compact bone is indicated by which letter? **G**

49. What type of cartilage would be found at letter D? **Articular**

50. What type of bone tissue is located at letter A? **Spongy**

51. The medullary cavity is indicated by which letter in the diagram? **H**

52. What is stored in the medullary cavity in adults? **Fats and Minerals**

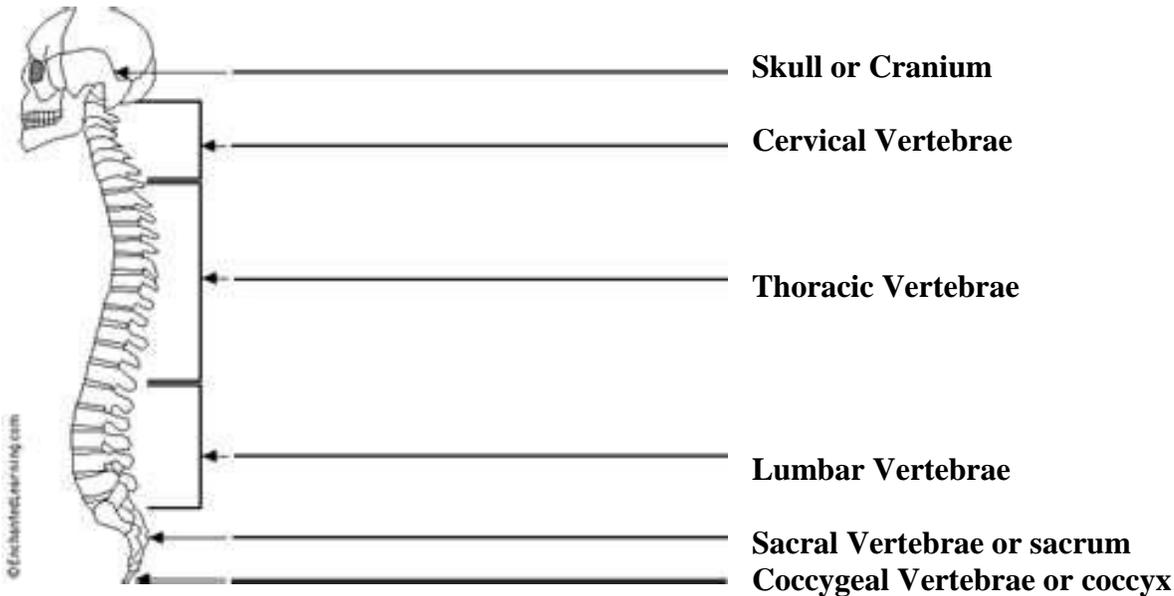
53. The blood vessels and nerves of an osteon are housed in which part? **Central/Haversian Canal**

54. The small canals that form a transport system between lacunae are called? **Canaliculi**

55. How many of each type of vertebrae are there?

- a. Cervical 7
- b. Thoracic 12
- c. Lumbar 5
- d. Sacral or sacrum 5 (these are fused together, but how many are there?)
- e. Coccygeal or coccyx 4 (these are fused together, but how many are there?)

56. Label the following sections of the human skeleton in the diagram below.



57. What is the name of the 1st vertebrae? What does it do for the human body?

Atlas, responsible for head nodding and attachment of skull to spine

58. What is the name of the 2nd vertebrae? What does it do for the human body?

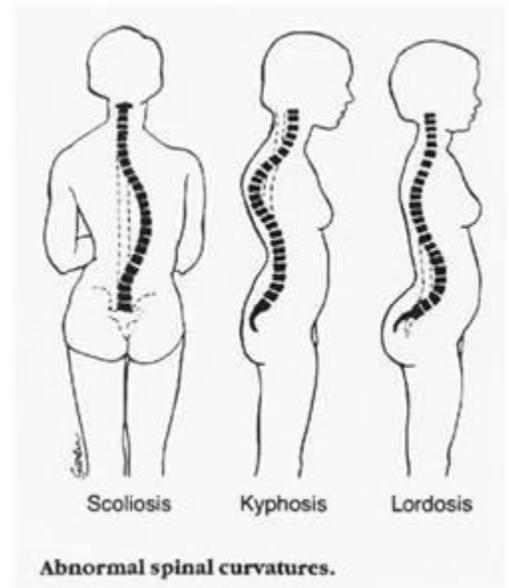
Axis, responsible for the rotation of head side to side

59. What are three types of abnormal spinal curvatures? Describe and draw a simple diagram of each.

Scoliosis – abnormal curvature – when viewing from an anterior or posterior standpoint, the spine curves laterally in either direction and does not run straight vertically (up and down).

Lordosis – abnormal curvature – when viewing from a lateral view, the spine in the lumbar region protrudes forward (anteriorly) causing a pot-belly look.

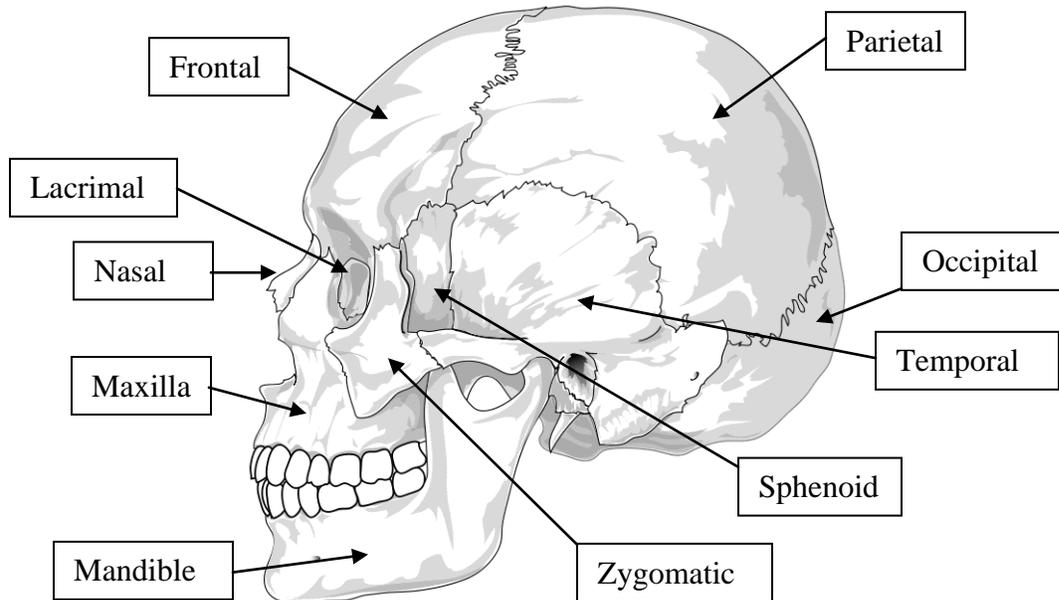
Kyphosis – abnormal curvature – when viewing from a lateral view, the spine in the thoracic region protrudes backwards (posteriorly) causing a hunch-back look.



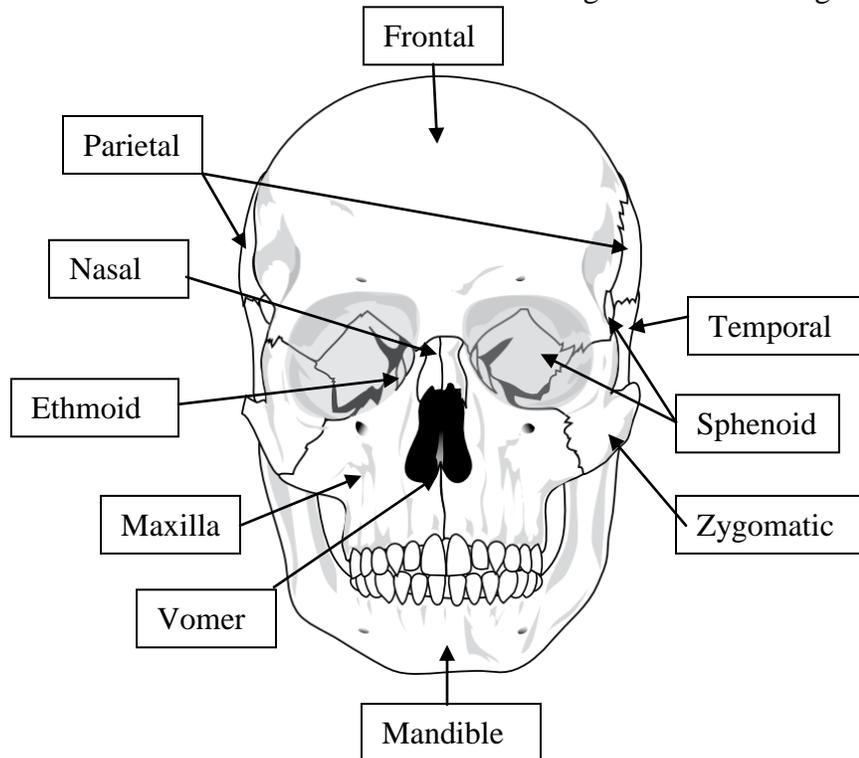
60. Explain the difference between a true, a false, and a floating rib.

True ribs are attached to the sternum directly by costal cartilage, false ribs are attached to a single piece of cartilage which attaches to part of the sternum, and floating ribs are not attached to sternum at all.

61. Below is a lateral view of the skull. **Label** the following bones on the diagram.



62. Below is an anterior view of the skull. Label the following bones on the diagram.



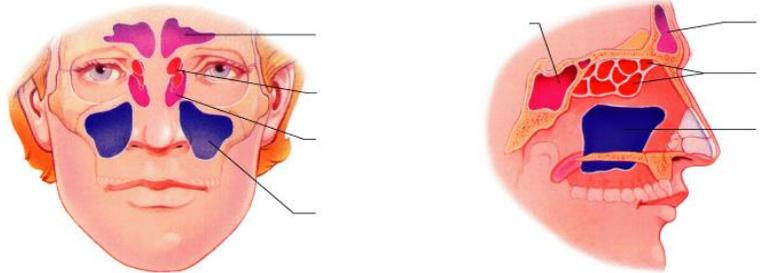
63. What is a suture? **Synarthroses, Immovable joints between skull bones**

64. What are fontanelles and what function do they serve in infant humans?

Soft spot of baby's skull that have not completely calcified, covered by fibrocartilage, allows baby's brain to grow and develop – usually fused by the age of 2. The skull can get larger.

65. What functions do the paranasal sinuses serve in the human body?

Lighten some bones, amplification and resonance for voice



66. What are the two main types of bone fractures and what is the major difference between them?

Compound (open) – bone breaks through skin and is visible outside the body

Simple (closed) – bone remains inside skin, no breakthrough or puncture

67. How do physicians treat bone fractures and dislocations?

The first step is called reduction which means they have to set the bone back into its normal position. This will serve to reduce the swelling in the area so they can do the next stage called immobilization. Immobilization is where the doctor places the injured body part in a hard cast or splint to prevent any kind of movement allowing the dislocation or fracture the time and lack of stress to heal on its own.

68. Why does it take a sprain injury so long to heal?

Sprains are injuries to the tendons and ligaments of the body. These organs are damaged usually due to excessive stretching. They are also composed of dense connective tissue which has a very poor blood supply. For this reason, these areas do not get the nutrients necessary to repair tissues quickly and therefore take a great deal of time to heal.

69. Fill in the following table about the structural joint classes.

Joint Type	Describe the Structure	Example(s)
Fibrous	Bones are united by fibrous tissue where they interlock and are bound tightly to each other; most are completely immobile.	Sutures of the skull; the joint at the distal ends of the tibia and fibula.
Cartilaginous	Bone ends are connected by cartilage allowing some slight mobility.	Pubic symphysis of the pelvis; intervertebral joints of the spine
Synovial	Where the articulating bone ends are separated by a joint cavity containing a fluid called synovial fluid to reduce friction	The knee joint; the joints in the wrist; the joint at the shoulder and hip

70. Describe the four characteristic features of a synovial joint.

There is a joint cavity that contains the synovial fluid to help reduce friction between bones.

Each of the epiphyses of the bones are also covered by articular cartilage that helps keeps bone from rubbing against each (friction) as well.

Surrounding the outer parts (laterally) of the joint, there is a fibrous capsule that helps provide support and protection.

There are also reinforcing ligaments that help stabilize the joints and bursa sacs full of fluid.

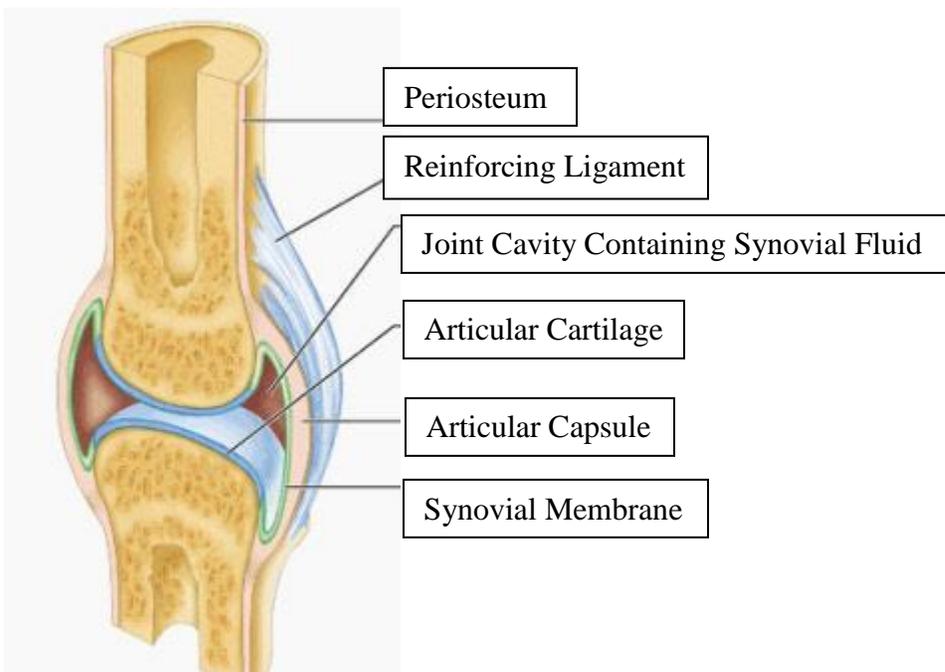
71. Describe the three types of arthritis.

Osteoarthritis – most common form due to aging process, commonly called wear and tear arthritis, 1 in 7 people are projected to suffer from this in the US alone

Rheumatoid – autoimmune disorder where the immune system is attacking the joints themselves and causing break down of articular cartilage and synovial membranes leading to major inflammation and possible deformation as well if aggressive therapy is not employed. Affects the body symmetrically – if right leg is affected, the left leg is also usually affected simultaneously

Gouty Arthritis – arthritis due to the accumulation of urate (uric acid) in the joint cavities, especially in areas like the big toe. Often can be controlled through dietary changes; sometimes a result of diabetes or reduced kidney function.

72. Label the parts of the synovial joint on the diagram below.



73. The articular cartilage and the synovial fluid both help with what function in synovial joints?

The articular cartilages cover the epiphyses of long bones and serve to reduce friction between these areas. The synovial fluid is found within the joint cavity and also serves to lubricate joints and reduce friction overall.