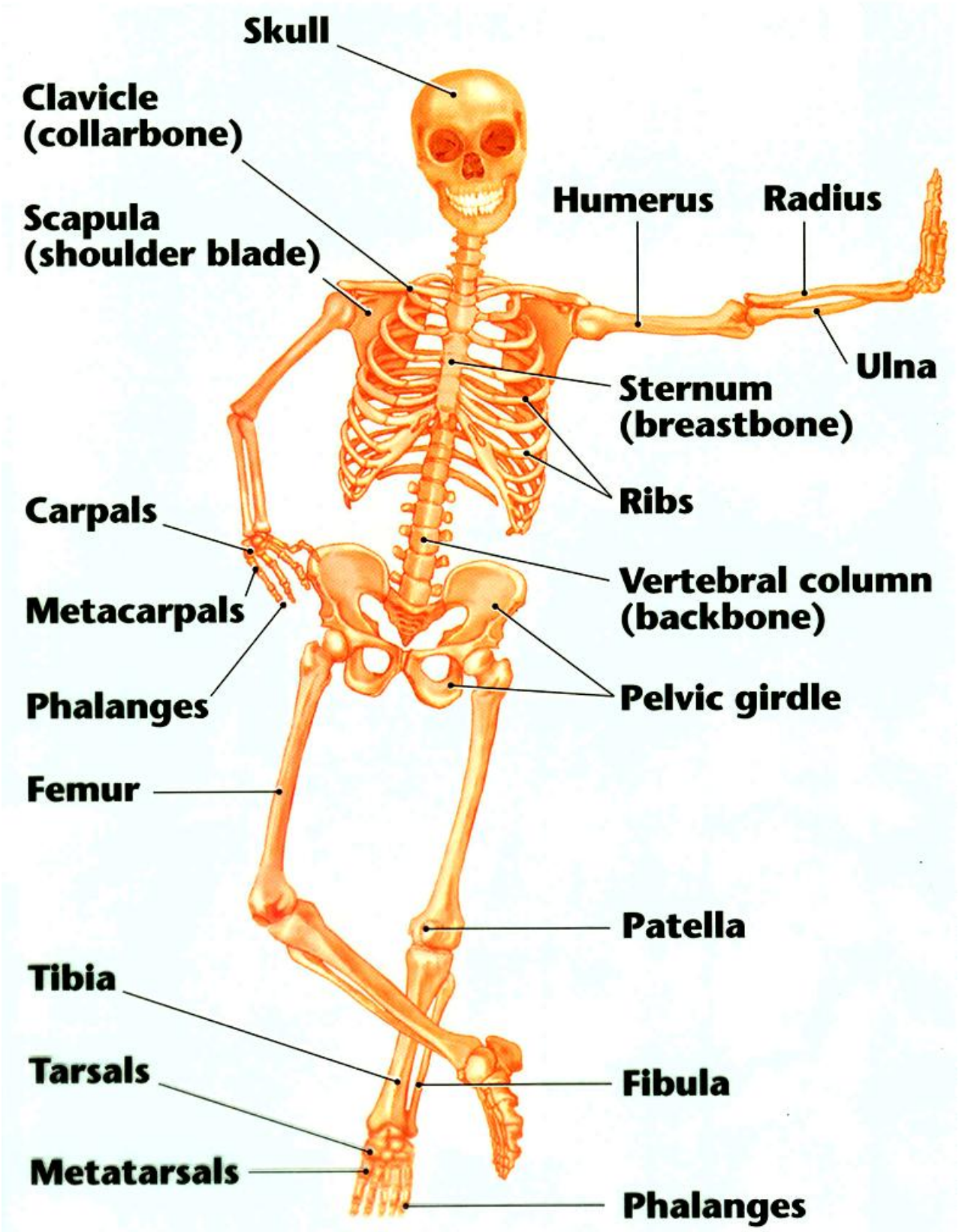
Station 1

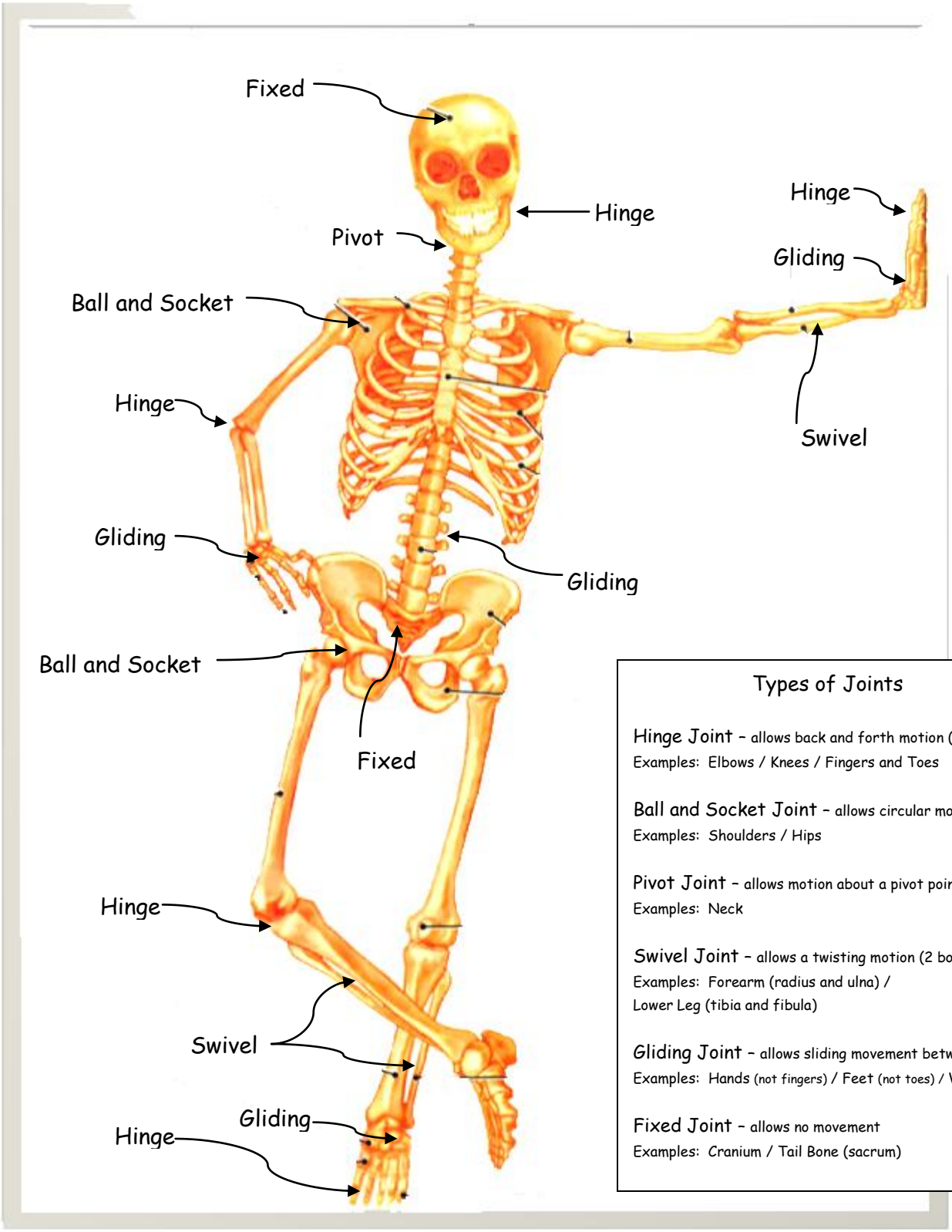
1. Label the bones on your answer sheet.



Skeletal System Tour Lab

Station 2

2. Label the joints on your answer sheet.



Types of Joints

Hinge Joint – allows back and forth motion (like a door)
Examples: Elbows / Knees / Fingers and Toes

Ball and Socket Joint – allows circular motion
Examples: Shoulders / Hips

Pivot Joint – allows motion about a pivot point
Examples: Neck

Swivel Joint – allows a twisting motion (2 bones)
Examples: Forearm (radius and ulna) /
Lower Leg (tibia and fibula)

Gliding Joint – allows sliding movement between bones
Examples: Hands (not fingers) / Feet (not toes) / Vertebrae

Fixed Joint – allows no movement
Examples: Cranium / Tail Bone (sacrum)

Station 3

The Skeleton…

Provides the framework for your body.

Gives structure and support.

Protects delicate organs.

Produces new blood cells.

Stores important minerals.
(calcium and phosphorus)

Allows you to stand upright

Station 3

This is a replica of a real human skeleton. It is made of plastic that was molded from real human bones. The detail on all external surfaces is very accurate. To see a real human skeleton from a real person just look in the hallway display case (ask your teacher before wandering out of the room).

3. Is this skeleton *articulated* or *disarticulated*?

Hint: articulate (ar tik' ye lat) – connected with joints disarticulate (dis ar tik' ye lat) – not connected

4. If x-rayed, these bones would look …

A) the same as real bone x-rays

B) different from real bone x-rays

Explain!

5. Without your bones you would be a shapeless blob. Besides giving you structure and support, what do your bones do for you?

Station 4

The bone count…

Adult humans have about 206 bones

(Small bones of the hands and feet can vary from person to person)

The Skull… 29 bones (protects the brain, eyes, and ears)

The Spinal Column…26 bones (protects the nerves of the spine)

The Rib Cage… 25 bones (protects the heart and lungs)

24 ribs and breastbone

The shoulders, arms, and hands… 64 bones

The Pelvis, legs, and feet… 62 bones

Station 4

6. How many ribs make up the rib cage?

The Rib Cage

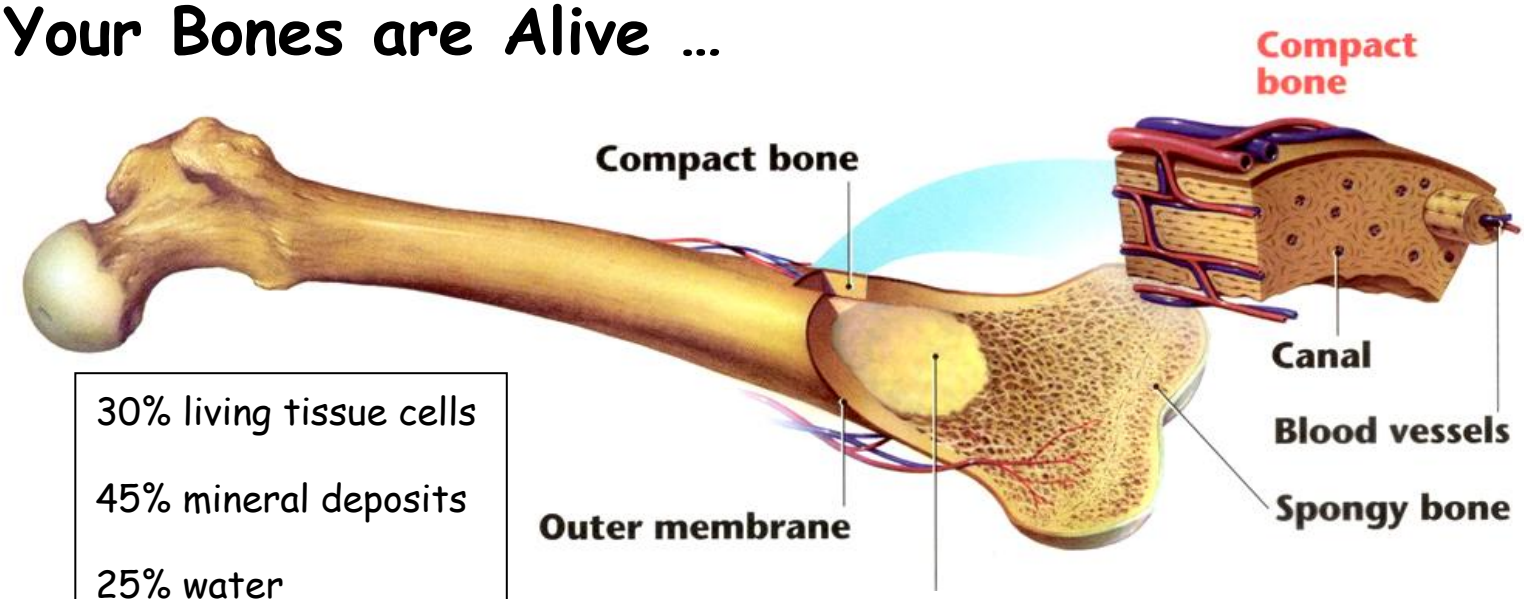
7. What is the name of the bone labeled "#2"?

8. What two major organs are protected by the rib cage?

9. If you were punched in the stomach, would your ribs protect you?
   Explain!

Station 5

Your Bones are Alive …



30% living tissue cells

45% mineral deposits

25% water

Periosteum – tough membrane forming the outer covering of bone

Compact Bone – beneath the periosteum; made up of living bone cells

Haversian Canals – holes through which blood vessels and nerves extend.

Spongy Bone – the inner layer of the bone filled with spaces. Just as strong as compact bone.

Bone Marrow – substance filling the spaces of spongy bone. Blood cells are made here.

Red Marrow – found in the skull, breastbone, vertebrae, hip bones and the ends of long bones.

Yellow Marrow – found in the shafts of long bones. Made of mostly fat cells that can be converted into red marrow if needed.

Station 5

This is real bone that has been preserved. Our sample shows a cross section of the long bones (the bone has been cut into slices).

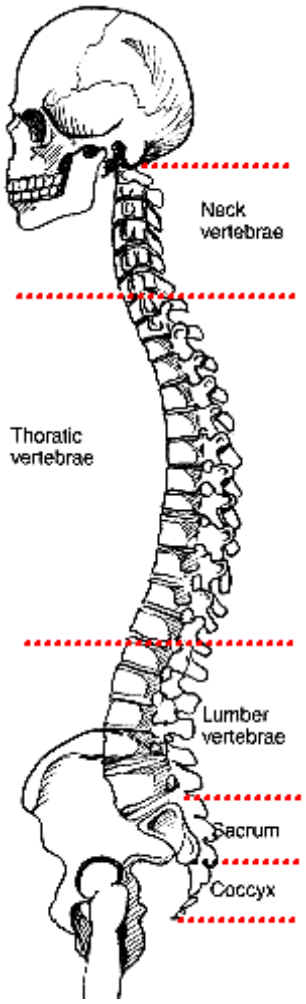
10. What is the soft stuff in the center of the bones?

11. What type of cells (besides bone) are made in the spaces at the center of spongy bones?

12. Label your diagram of a bone.
(include: compact bone / spongy bone / bone marrow)

Station 6

The Spine …



26 Bones Called Vertebrae

7 Cervical … Neck

12 Thoracic … Chest

5 Lumbar … Lower Back

1 Sacrum … Tail Bone

1 Coccyx … Tail Bone

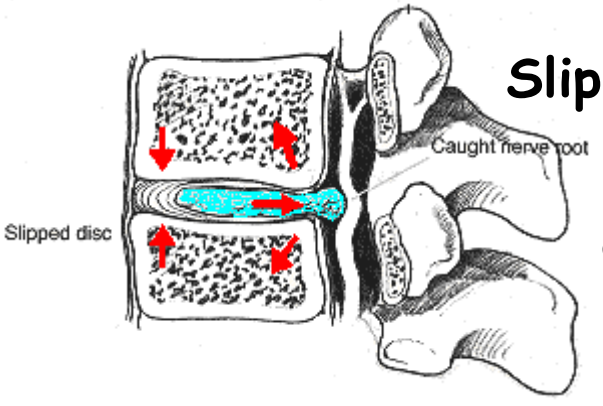
Cartilage Discs

Separate each vertebra.

Act as Shock absorbers.

Ligaments

Hold the vertebrae and discs together. Connect bone to bone.



Slipped Disc

A disc that has squeezed out and is touching a nerve.

Station 6

13. How many vertebrae can you count in this spine?

14. Label the 7 cervical vertebrae on your diagram.
(C1, C2, C3, C4, C5, C6, C7)

15. Label the 12 thoracic vertebrae on your diagram.
(T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12)

16. Label the 5 lumbar vertebrae on your diagram. (L1, L2, L3, L4, L5)

17. Label the sacrum and coccyx on your diagram.

18. How may cartilage disks are in your spine?
(Hint: you will need to count)

Station 7

Bone Growth…

A baby is born with a temporary skeleton of mostly soft cartilage.

Bones gradually harden as a child grows. The calcium phosphate needed comes from milk.

Bones grow outward from the center.

Bones eventually stop growing. The clavicle (collar bone) is the last to stop growing.

Bone growth stops at about age 16 -18 for females and 18 – 21 for males.

Dwarfism is caused by a lack of growth hormone.

Giantism is caused by too much growth hormone.

(Growth hormone is regulated by the pituitary gland)

Station 7

19. Your clavicle (collar bone) is actually two bones. They attach from the sternum (breast bone) to the _____.

Name the bone

20. You should notice that one end of the clavicle is flatter while the other end is more rounded. Which end attaches to the sternum?

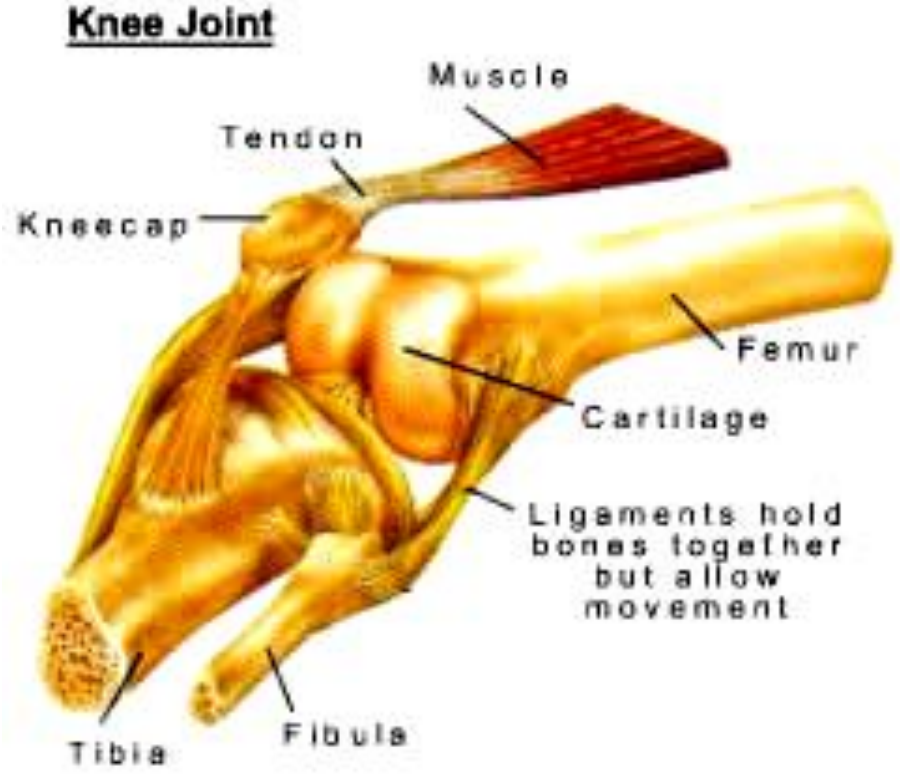
(Hint: Consult your laboratory skeleton)

21. Who would be more likely to break their collar bone in a fall … an adult or an infant?

Explain!

Station 8

Joints occur wherever two or more bones meet.



Cartilage is found between bones and acts as a shock absorber.

Fluid fills the space between the bones and acts to lubricate them.

Ligaments and Muscles act to hold the bones together.

Station 8

22. The sample of real bone is a _____ joint.

    Elbow

    Knee

    Hip

    Nose

23. Are these human bones or the bones from some other animal?

    What evidence do you see to support your answer?

24. What do ligaments do?

Station 9

25. Which leg is this, left or right?

    (Hint: Consult your laboratory skeleton)

26. What is the name of the bone that makes the bump on the inside of your ankle?

    (Hint: Consult your laboratory skeleton and station 1)

27. Bone "D" is called the _____?

    (Hint: see station 1)

28. What *type* of joint is the knee?

    (Hint: see station 2)

Station 10

29. Which arm is this, left or right?

(Hint: Consult your laboratory skeleton)

30. What is the name of the bone that is thickest at the wrist?

(Hint: Consult your laboratory skeleton and station 1)

31. What advantage is there in having two bones (radius and ulna) in your lower arms?

(Hint: Consult your laboratory skeleton)

32. What *type* of joint is this?

(Hint: See station 2)

Station 11

33. Which leg is this, left or right?

(Hint: Consult your laboratory skeleton)

34. What is the name of the smaller bone in the lower leg?

(Hint: see station 1)

35. What *type* of joint forms where the femur meets the pelvis (pelvic girdle)?

(Hint: See stations 1 and 2)

36. What type of movement does this joint allow?

(Hint: See station 2)

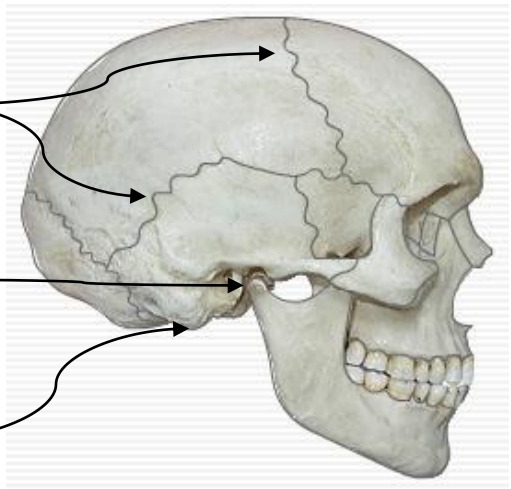
Station 12

37. The skull has 3 different *types* of joints. Identify them.
(Hint: see stations 1 and 2)

Joint A _____

Joint B _____

Joint C _____



38. The zig zag lines in the cranium (top of skull) indicate which *type* of joint?
(Hint: See station 2)

39. How are the joints in the cranium of adults different from those in infants?
(Hint: Use your cranium)

Station 13

40. Which arm is this, left or right?

(Hint: Consult your laboratory skeleton)

41. How many bones are there in the human hand?

42. What is the name of the arm bone that makes the "big bump" on your wrist?

(Hint: Consult your laboratory skeleton and station 1)

43. Why is it important for us to have many small bones in our hands?

(Hint: study the hand and how it works)

Station 14

Carefully try to assemble the bones of the foot over the diagram. It is a bit tricky so just do your best.

44. Which foot is this, left or right?

(Hint: Consult your laboratory skeleton)

45. How many bones make up the human foot?

(Hint: You could count)

46. Which sentence best describes your experience with the foot?

A) Hey, no problem, it was easy!

B) It wasn't too hard to figure out where the bones go but getting them there was a real pain!

C) **&^&#@"%$^#@&&*&%<! **FOOT**!

Station 15

Carefully try to assemble the bones of the foot over the diagram. It is a bit tricky so just do your best.

47. Which hand is this, left or right?
    (Hint: Consult your laboratory skeleton)

48. How many bones make up the human hand?
    (Hint: You could count)

49. Which sentence best describes your experience with the hand?

    A) Hey, no problem, it was easy!
    B) It wasn't too hard to figure out where the bones go but getting them there was a real pain!
    C) **&^&#@"%$^#@&&*&%<! **HAND**!

Station 16

50. Is this bone from the left should or the right shoulder?
(Hint: Consult your laboratory skeleton)

51. The scapula bone forms a socket on one end? What is the name of the bone that fits into that socket to form the shoulder joint.
(Hint: Consult your laboratory skeleton and stations 1 and 2)

Station 17

No Bones About It! …

Bones fuse together with age.

At birth humans have about 300 "bones" (mostly cartilage)

Adult humans have about 206 bones. Where did the rest of them go?

Half of your bones are in your hands and feet!

Bones are extremely strong!!

- a thigh bone is stronger than a steel bar of the same size and shape
- bones can withstand up to 24,000 pounds per square inch. A person walking exerts 12,000 pounds per square inch on the thigh bone.

When you sit or stand your discs are squeezed together. By the end of the day you are $\frac{1}{4}$ to $\frac{1}{2}$ inch shorter than when you got up!!

Longest Bone … thigh bone (1/4 your height)

Shortest Bone … inner ear bones (1/1000 inch)

Station 17

52. What is your favorite bone fact?
    Why?