Name:_____ KEY
Date:_____

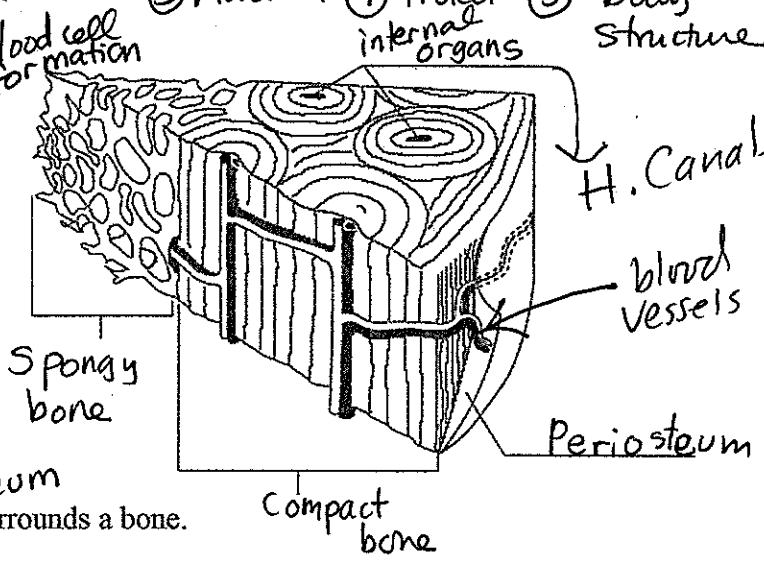
Chapter 36 in the Dragonfly book
Skeletal and Muscular System HW

The Skeletal System

List five functions of the skeletal system.

(1) Mineral storage (2) Site of blood cell formation (3) Movement (4) Protect internal organs (5) body structure

2. The diagram shows a cross-section of bone. Label the Haversian canals, periosteum, compact bone, and spongy bone.



3. Describe the difference between spongy bone and compact bone.

-Spongy bone is less dense (looks like latticework) Compared to compact bone

4. A tough layer of connective tissue called the Periosteum surrounds a bone.
5. Nerves and blood vessels run through the H. Canals in bones.
6. Bone Marrow is soft tissue in bone cavities that stores fat (yellow) or produces blood cells (red).
7. Bone with a latticework structure is called Spongy bone.
8. During the process of ossification, cartilage is replaced by bone.
9. Cells that secrete mineral deposits that form bone are called Osteo.
10. What are the 2 types of bone marrow found in cells? red and yellow
11. Which type of bone marrow produces blood cells? red
12. When you were an embryo, your skeleton was made out of Cartilage
13. In terms of blood vessels, what is the difference between cartilage and bones?

Cartilage does not have blood vessels in it and relies on diffusion, Bone does have blood vessels

14. What is the difference between osteoblasts and osteocytes?

Osteoblasts are bone cells that secrete minerals that replace cartilage. Osteocytes are more mature forms of bone cells that continually replace minerals + bone tissue after growth is complete

15. What is a growth plate and where is it located? long

- Cartilage located at the ends of the bones forms "growth plates" - Places where the bone grows longer by means of ossification.

16. Many females "finish growing" earlier in adolescence than males, explain what this means in terms of bones.

This means that the cartilage growth plates in most females ossifies at an earlier age compared to males

17. A disorder called Osteoporosis results when osteoclasts break down bone minerals more quickly than they can be deposited.

8. What is a joint? Area where 2 bones come together/join

19. List the three classifications of joints, based on their type of movement.

1) Non-moveable
2) Slightly moveable
3) freely moveable

20. How are tendons and ligaments different?

For Questions 21-26, match each joint with the category of joints that it represents

Joint	Category
B 21. Ankle	A. Ball-and-socket joint
E 22. Between two vertebrae	B. Hinge joint
A 23. Shoulder	C. Immovable joint
B, D 24. Elbow	D. Pivot joint
C 25. Between skull bones	E. Slightly movable joint

26. Many young athletes have damage to their ACL. What is the ACL and what does it connect?

Anterior Cruciate Ligament = In center of knee, connects femur + tibia

The Muscular System

For Questions 1–6, write True if the statement is true. If the statement is false, change the underlined word or words to make the statement true.

T 1. Large skeletal muscles have long, slender cells with multiple nuclei.

Striations 2. The light and dark bands in skeletal muscles are called ~~Z lines~~.

Spindles 3. The cells of smooth muscle are shaped like ~~boxes~~.

T 4. Smooth-muscle tissue lines the inside of the blood vessels and the digestive tract.

Involuntary 5. Cardiac muscle is under ~~voluntary~~ control.

T 6. The cells in cardiac muscle are connected to each other by gap junctions that allow electrical impulses to pass from cell to cell.

7. Complete the table that compares and contrasts the three types of muscle tissue.

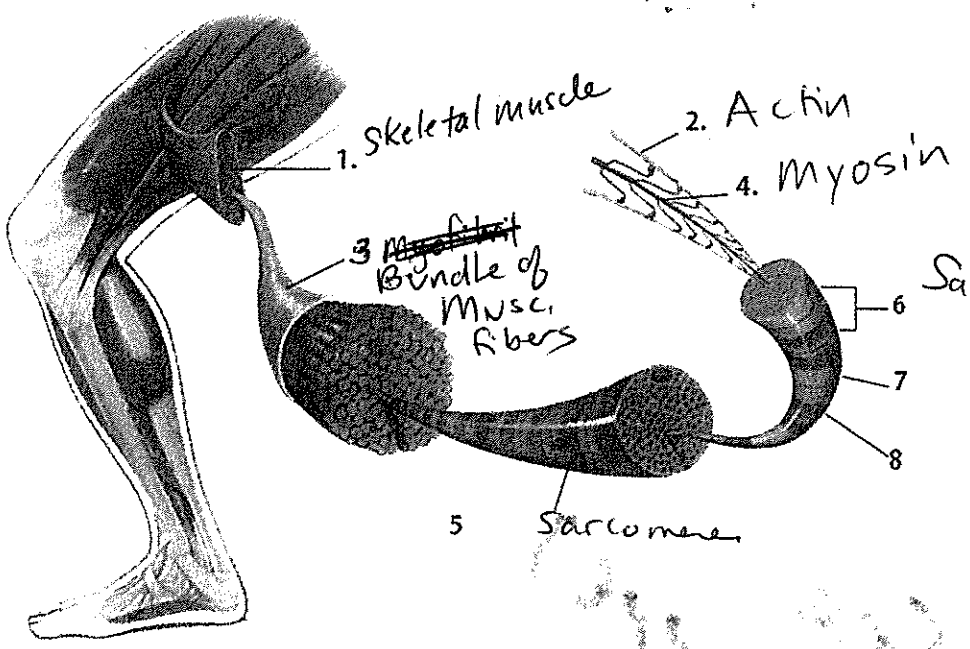
Types of Muscle Tissue		
Type of Muscle	**Striated/Not Striated**	**Type of Control**
Skeletal	Striated	Voluntary
Smooth	non-striated	Involuntary
Cardiac	Striated	Involuntary

Key Key Key Key Key Key Key Key Key Key 2

For Questions 8–13, complete each statement by writing the correct word or words.

8. Muscle fibers are filled with myofibril, which are bundles of tightly packed protein filaments.
9. The thick protein filaments in muscle fibers are called myosin, and the thin protein filaments are called Actin.
10. The thick filaments in muscle fibers form cross-bridges, which cause the filaments to slide past each other.
11. The energy used in muscle contraction is supplied by ATP.
12. Impulses passed from motor neurons release Ca^{2+} ions within the muscle fibers.
13. While producing movements, muscles supply the force, bones act as levers, and a joint acts as a(n) hinge.
14. Skeletal muscles work in opposing pairs.
15. Many mitochondria are found in the cells of skeletal muscle, which uses oxygen for aerobic respiration.

16. Label the image of the skeletal muscle below. Use the terms: actin, myosin, myofibril, z line, muscle fiber (cell), bundle of muscle fibers, skeletal muscle



17. How is a muscle fiber related to myofibrils?

myofibrils make up muscle fibers

18. What are the names of the 2 proteins that make up the striations in the skeletal muscle?

actin & myosin

19. Which filaments connect to the Z lines? ACTIN

20. What is a sarcomere?

— Two z-lines + filaments in between them

21. What is a neuromuscular junction? The Synapse between a neuron and a muscle cell

22. What neurotransmitters are released from motor neurons to cause impulses in muscle cells?

acetycholine

Key Key Key Key Key Key Key Key

23. Explain the role of calcium in muscle contraction.

- When a neuron sends acetycholine into the neuromuscular junction, a muscle cell receives an impulse.
- Impuse @ muscle cell releases Ca^{2+}
- Ca^{2+} affect regulatory proteins that cause myosin cross-bridges to form when

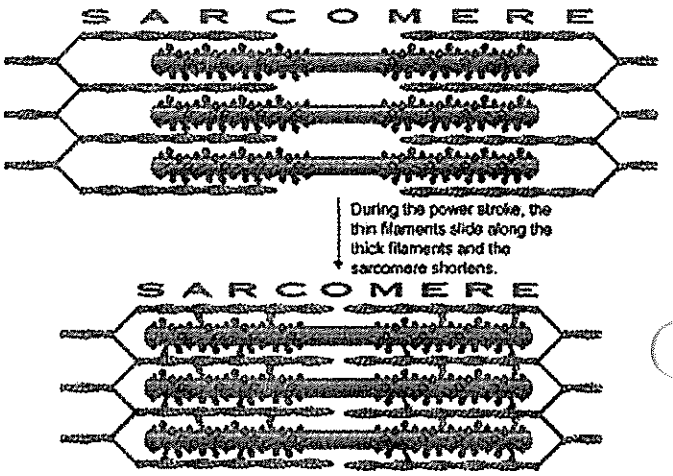
24. Explain the role of tendons in moving your arm.

Tendons connect muscle to bone. Muscles contract, they pull tendons which in turn pull the bones.

25. Does a sprinter have more white or red muscle than the long distance runner on the track team. white
Why? Red-slow white-fast

The sprinter must have a greater # of white muscle fibers for speed.

26. Explain the "sliding filament model" of muscle contraction to the best of your ability. Remember that this is your chance to makes sense of this information, so read it, take notes, put them away and THEN attempt to answer this question. You may use the diagram to your right to help you.



See Notes (p1 & 2)