

UNIT 5 - MUSCULAR SYSTEM

WORKSHEET - Muscular System

Name _____ Period _____

1. Muscle tissue has four characteristics. What are they? Define them.
 - a.
 - b.
 - c.
 - d.

2. List the four basic functions of the muscular system.
 - a.
 - b.
 - c.
 - d.

3. Three types of muscle tissue are found in the human body. What are they? Where is each type found?

TYPE	CHARACTERISTICS	LOCATION
	voluntary - striated	
		heart
Smooth (Visceral)		

4. Define Tendon:

5. Contrast thick and thin filaments by completing these questions:
 - a. Thin filaments are composed mostly of molecules of _____. Each actin molecule contains a binding site for (myosin / actin).
 - b. Two other proteins in thin filaments are _____ and _____.
 - c. (Thick / Thin) myofilaments are composed mostly of myosin. Myosin molecules are shaped much like _____.

6. Identify the following:
 - a. Motor neuron:
 - b. Neuromuscular junction:
 - c. Acetylcholine (Ach):
 - d. Motor end plate:
 - e. Motor unit:

7. Choose the type of muscle tissue that fits each descriptive phrase.
C = Cardiac Muscle S = Smooth Muscle SK = Skeletal
- _____ a. Forms the bulk of the wall of the heart
 - _____ b. Has intercalated discs
 - _____ c. Involuntary, nonstriated
 - _____ d. Involuntary, striated
 - _____ e. Located in walls of hollow internal surfaces such as blood vessels
 - _____ f. Exhibits autorhythmicity
 - _____ g. Requires a constant supply of oxygen so mitochondria are larger and more numerous
 - _____ h. Is slower to contract than the other two tissue types
 - _____ i. Does not have sarcomeres
8. Describe the “sliding filament theory”.
- 9.. Define these terms.
- a. Origin
 - b. Insertion
10. Define the role of the prime mover (agonist), antagonist, synergist, and fixator in producing body movements.
- Prime Mover:
- Antagonist:
- Synergist
- Fixator:
11. What would happen if the flexors of your forearm were functional, but not the antagonistic extensors?
12. What action would occur if both the flexors and extensors contracted simultaneously?
13. The diaphragm is _____-shaped. Its oval origin is located _____ . Its insertion is not into bone, but rather into dense connective tissue forming the roof of the diaphragm; this tissue is called the _____. Contraction of the diaphragm flattens the dome, causing the size of the thorax to (increase / decrease), as occurs during (inspiration / expiration).

14. Find the location to the pectoralis major, deltoid, and latissimus dorsi muscles. All three of these muscles are (superficial / deep). They are all directly involved with movement of the (shoulder girdle / humerus / radius/ ulna).
15. Write the name of the muscles that fit these descriptions.
- a. Covers most of the posterior of the humerus _____
 - b. Largest muscle of the chest region; used to throw a ball in the air (flex humerus) and to adduct arm. _____
 - c. Bows and rotates head from side to side. _____
 - d. Controls action at the elbow for a movement such as the downstroke in hammering a nail _____
 - e. Flexes the forearm _____
 - F. Hyper extends the humerus, as in doing the “crawl” swimming stroke _____
 - G. _____ Moves shoulders by raising them and pulling them back, helps hold head erect
 - h. Abducts the arm _____
16. Match the muscle names below with their descriptions.

Ham. - Hamstrings
Gas. - Gastrocnemius
GMax. - Gluteus maximus
QF. - Quadriceps femoris

- _____ a. Consists of four heads: rectus femoris and three vastus muscles (lateralis, medialis, and intermedius).
 - _____ b. This muscle group includes three separate muscles: biceps femoris, semitendinosus, and semimembranosus. It is the antagonist to quadriceps femoris.
 - _____ c. Large muscle mass of the buttocks; extends and rotates the thigh laterally.
 - _____ d. A posterior muscle located in lower leg the leg, it forms the “calf”. Attaches to the calcaneus by the Achilles tendon.
17. This muscle is one of the most commonly exercised muscles in the body but is one of the least critical muscles in the body from a functional standpoint. Which muscle is it?
- _____

(*HINT*: Curls for the Girls)

18. SELECTED SKELETAL MUSCLES

Complete the following table by identifying the appropriate MUSCLE, MUSCLE LOCATION, or MUSCLE FUNCTION.

MUSCLE	LOCATION	FUNCTION
Biceps Brachii	anterior aspect of the upper arm	a.
b.	posterior aspect of the upper arm	extends the forearm
c.	anterior aspect of the neck	flexes the head and neck
Trapezius	d.	e.
f.	covers the shoulder	g.
h.	chest	adducts the arm
i.	superficial muscle of the thoracic and lumbar region of the back	extends a flexed arm or hyperextends the arm from the anatomical position
Diaphragm	j.	k.
l.	posterior aspect of the lower leg	m.
Hamstring muscle group	posterior aspect of the thigh	n.
o.	anterior aspect of the thigh	p.
q	buttocks region	extends a flexed thigh or hyperextends the thigh from the anatomical position

WORKSHEET - Muscular System - Answers

1.
 - a. Contractility - the ability of muscle tissue to shorten and produce force.
 - b. Extensibility - the ability of muscle tissue to be stretched with very little application of force from the opposing muscle group.
 - c. Elasticity - the ability of muscle tissue to return to its normal resting length from its extended position without additional energy requirements.
 - d. Excitability - the ability of muscle tissue to receive and respond to a stimuli (electrical).

2. Motion, maintenance of posture, heat production

3.
 - a. Skeletal muscle tissue - attached to bones and moves parts of the skeleton. It is striated and voluntary.
 - b. Cardiac muscle tissue - forms the bulk of the wall of the heart. It is striated and involuntary.
 - c. Smooth (Visceral) muscle tissue - located in the walls of hollow internal structures, such as blood vessels, the stomach, and the intestines. It is nonstriated and involuntary.

4. Tendon - muscular connective tissue in a cord like formation.

5.
 - a. Actin, myosin
 - b. Tropomyosin, troponin
 - c. Thick, golf clubs

6.
 - a. Motor neuron - a nerve cell that stimulates muscle
 - b. Neuromuscular junction - the end of the axon terminal where it attaches to the muscle fiber
 - c. Acetylcholine - the neurotransmitter released from the synaptic vesicles that initiates an action potential in the muscle fiber
 - d. Motor end plate - the area of the muscle membrane directly under an axon terminal of a motor neuron
 - e. Motor unit - a motor neuron and all muscle fibers it innervates

7.

a.	cardiac	e.	smooth
b.	cardiac	e.	smooth
c.	smooth	g.	cardiac
d.	cardiac	h.	smooth
		i.	smooth

8. The sliding filament theory is the weakest stimulus from a neuron that can initiate a contraction is the threshold stimulus. Once a threshold stimulus is applied, individual muscle fibers of a motor unit will contract to their fullest extent or will not contract at all. Individual muscle fibers do not partly contract.

9.
 - a. The attachment of a muscle tendon or aponeurosis to the stationary bone.
 - b. The attachment of a muscle tendon or aponeurosis to the movable bone.
10. Prime mover: A muscle that causes a desired action.
Antagonist: The muscle which has an opposite effect to that of the prime mover.
Synergist: A muscle which serves to steady a movement preventing unwanted movements; helps the prime mover be more efficient.
Fixator: A muscle which stabilizes the origin of the prime mover.
11. Your arm would flex, but would be unable to relax and extend.
12. No action would occur - there would be no movement at the elbow joint.
13. a. dome; on the xiphoid process, costal cartilages of last six ribs, and lumbar vertebrae; central tendon; increase, inspiration
14. superficial; humerus
15.
 - a. Triceps brachii
 - b. Pectoralis major
 - c. Sternocleidomastoid
 - d. Triceps brachii
 - e. Biceps brachii
 - f. Latissimus dorsi
 - g. Trapezius
 - h. Deltoid
16.
 - a. QF.
 - b. Ham.
 - c. GMax.
 - d. Gas.
17. Biceps brachii
18.
 - a. Flexes the forearm
 - b. Triceps brachii
 - c. Sternocleidomastoid
 - d. Posterior aspect of the neck
 - e. Extends or hyperextends the head and neck
 - f. Deltoid
 - g. Abducts the arm
 - h. Pectoralis major
 - i. Latissimus dorsi
 - j. Separates the thoracic and abdominal cavities
 - k. Deflects diaphragm inferiorly increasing thoracic cavity volume

- l. Gastrocnemius
- m. Plantar flexes the foot
- n. Flexes the lower leg
- o. Quadriceps muscle group
- p. Extends the lower leg
- q. Gluteus maximus