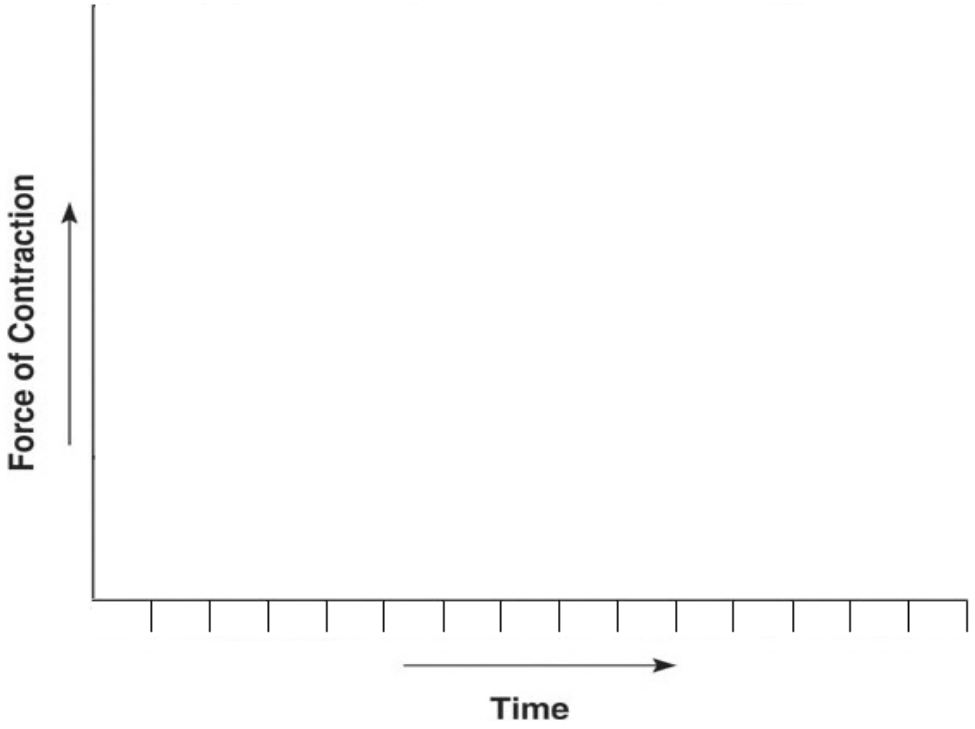
Name _____ **Per.** _____ **Date** _____

Muscle Twitch, Summation, Tetanus, and Skeletal Muscle Anatomy
Honors Anatomy

Muscle Twitch, Summation, Tetanus, and Recruitment

1. A single contraction that lasts only a fraction of a second is called a _____ _____.

On the graph below, draw a muscle twitch and label it's three parts. Also on the graph, draw and label the time of stimulation.



Match the three parts of a muscle twitch to its description.

_____ 5. The duration of a muscle twitch when the muscle returns to its resting length.

_____ 6. The duration of a muscle twitch between stimulation and the initiation of the contraction.

_____ 7. The duration of a muscle twitch when the muscle contracts or shortens in length.

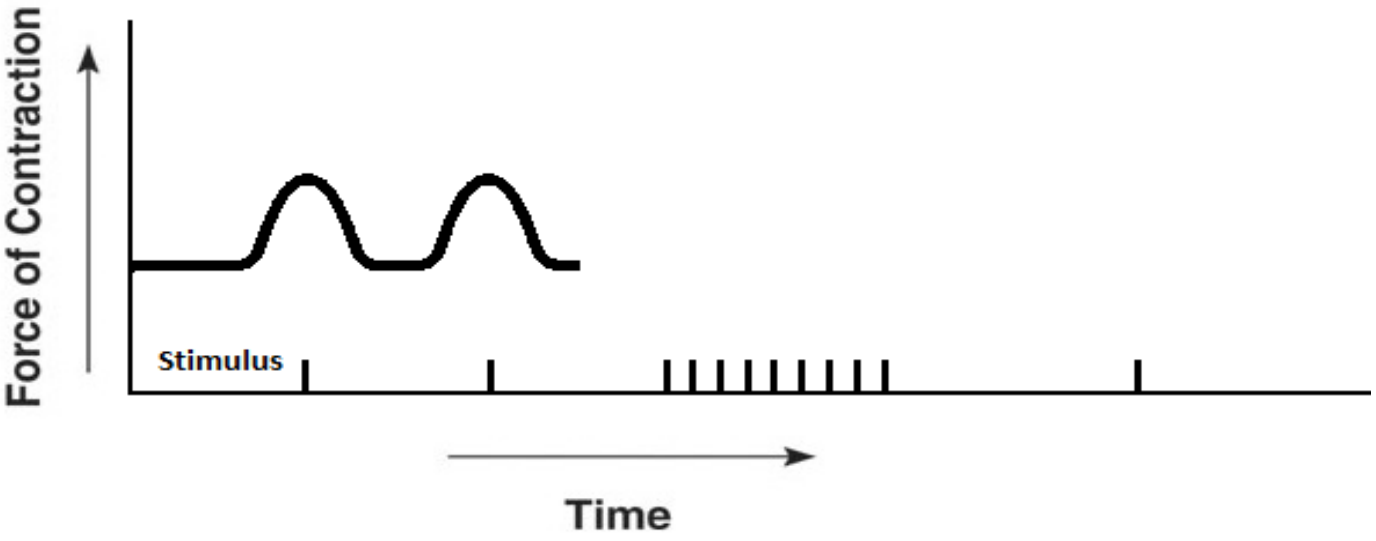
a. Contraction period
b. Latent period
c. Relaxation period

8. List the 2 ways the force of a muscle contraction can be increased.

a. _____ increases the force of contraction by increasing the frequency of the stimulus to the muscle fibers.

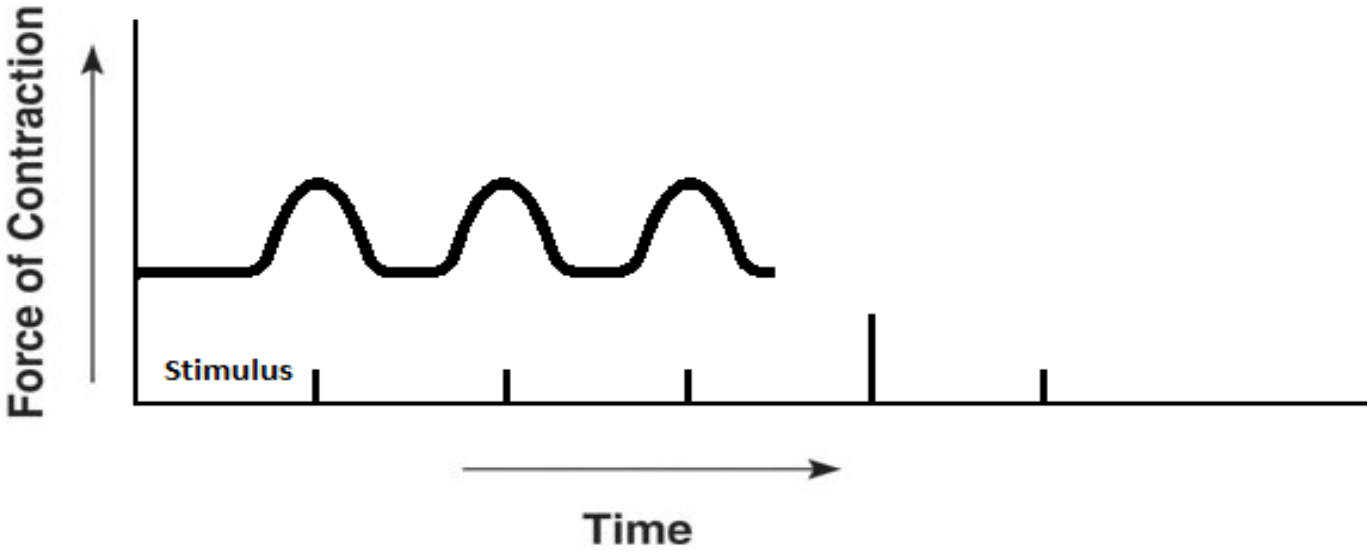
b. _____ increases the force of contraction by increasing the number of motor units stimulated.

Given the graph below, draw what the muscle twitch should look like.



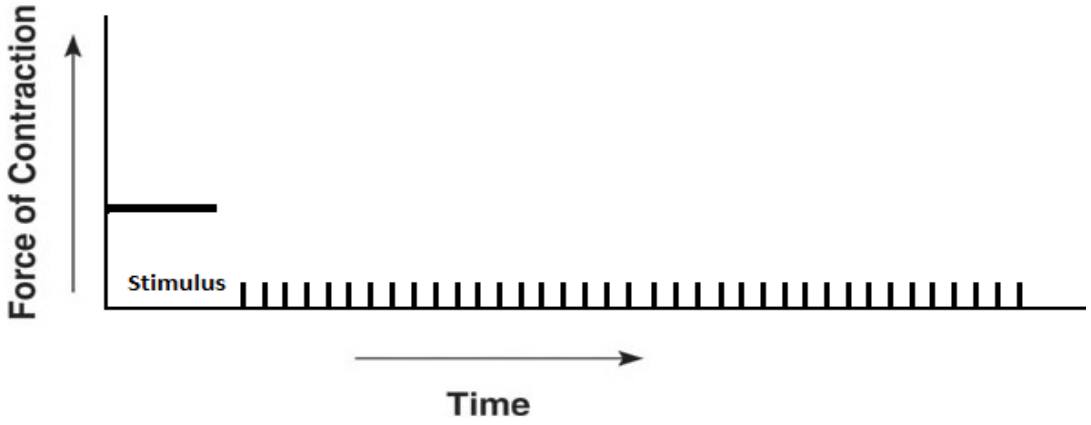
9. In the graph above, which way is being illustrated to increase the force of a muscle contraction.

Given the graph below, draw what the muscle twitch should look like.



10. In the graph above, which way is being illustrated to increase the force of a muscle contraction.

On the graph below, draw a muscle contraction illustrating tetanus or tetanic contraction and fatigue. Label tetanus and fatigue.



11. The sustained contraction that occurs when the frequency of stimulation is so rapid that there is no relaxation is called _____ _____.

12. Explain the cause for muscle fatigue.

13. A motor neuron and all of the muscle fibers that it innervates (connects to and stimulates) is called a _____ _____.

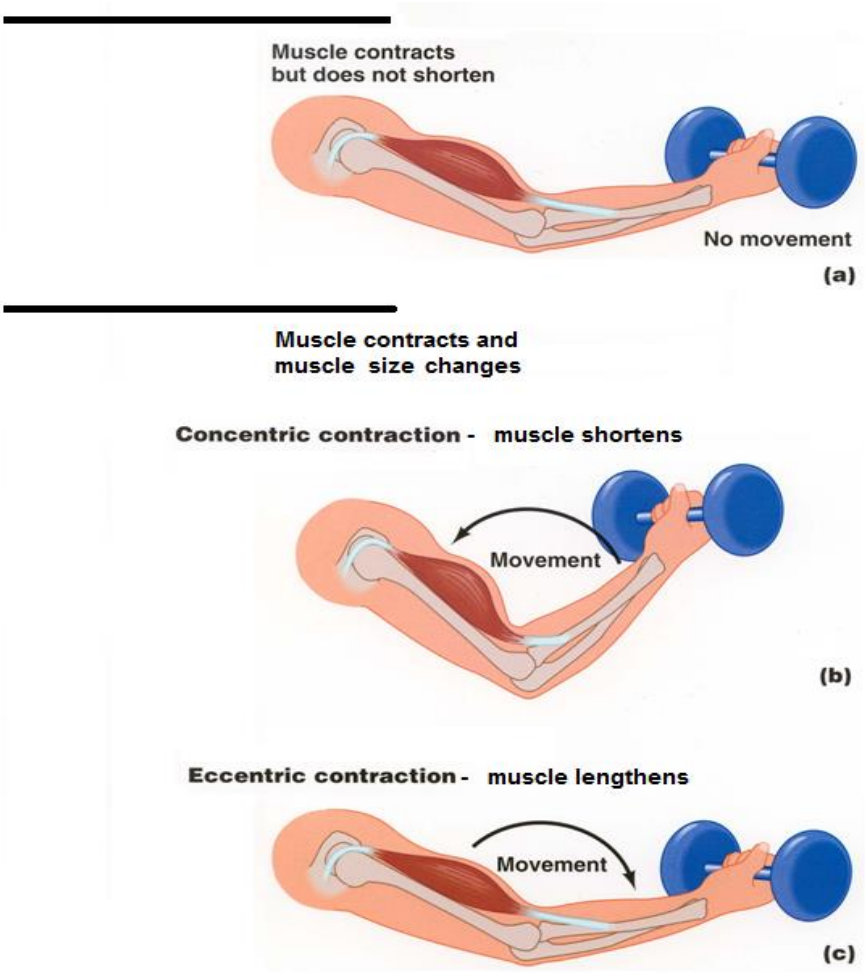
Given the list below, color and label the different parts of a motor unit.

- Axon terminal
- Motor neuron
- Muscle fiber

Types of Muscle Contraction and Tone

14. List the 2 classifications of muscle contractions.

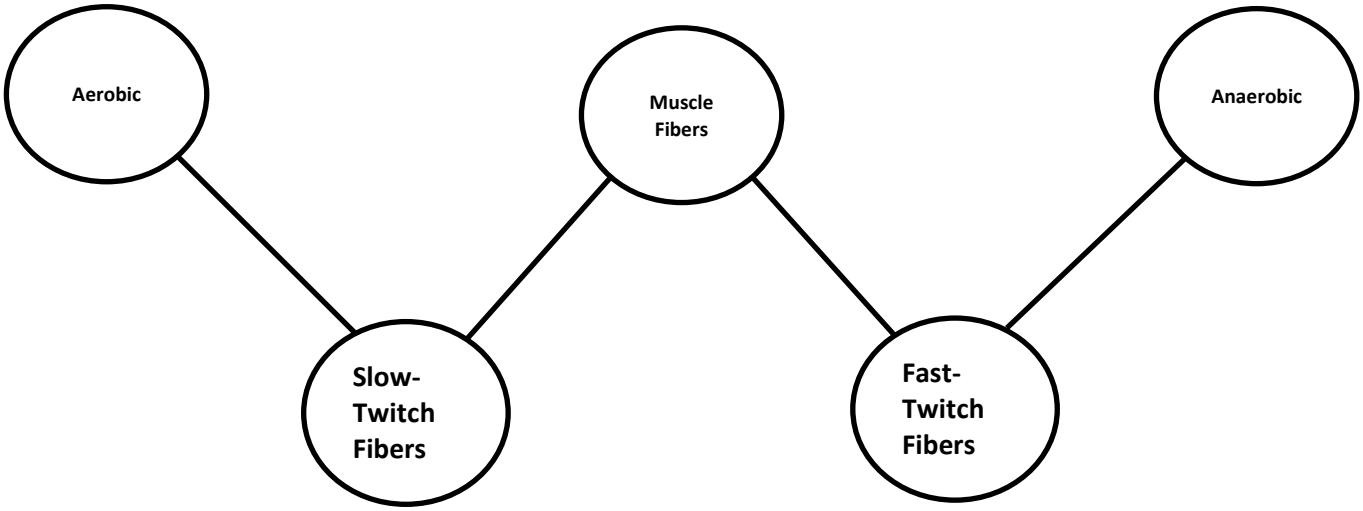
On the diagram below, label which illustration is an isotonic contraction and which illustration is an isometric contraction.



15. Some muscles exhibit _____ _____, in which some muscle's fibers are always contracting and under tension over long periods of time. An example of this type of continuous contraction occurs in the neck and back muscles to maintain posture.

Slow and Fast Twitch Fibers

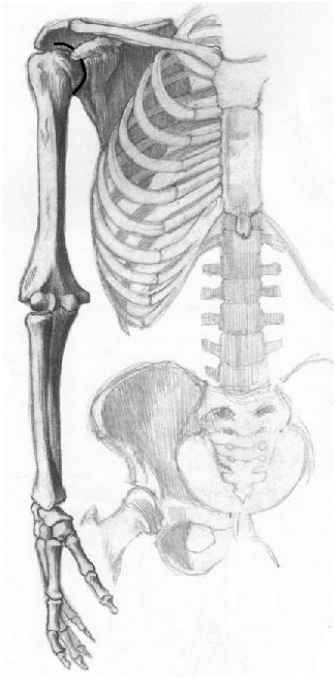
Complete the double bubble comparing and contrasting slow-twitch fibers to fast-twitch fibers.



Skeletal Muscle Anatomy

1. The muscle attachment location on the stationary bone (the bone that does not move) is called the _____.
2. The muscle attachment location on the bone that moves is called the _____.

On the diagram below of the anterior arm and forearm, 1) Draw, color, and label the biceps brachii, 2) Label the words origin and insertion to illustrate the location on the diagram, 3) Below the words origin and insertion, write the actual names of the landmarks for these sites of muscle attachment.



Muscle Groups

3. Muscles that accomplish or perform certain movements are called the _____
   a. The agonist that is the main muscle that performs the movement is called the _____ _____.
   b. Groups of agonists that work together to perform a movement and assist the prime mover are called _____.
4. Muscles acting in opposition to the agonists are called _____.
5. Muscles that hold a bone in place while another bone is moved are called _____.

Using the list below and the given movement, place the muscles under the appropriate group. See the example.

Example

Movement: Flexion of the Elbow

Muscles:	**Prime Mover**	**Synergist**	**Antagonist**
Biceps brachii			
Brachioradialis	Biceps brachii	Brachioradialis	Triceps brachii
Triceps brachii			

Movement: Extension of the lower leg

Muscles:	**Prime Mover**	**Synergist**	**Antagonist**
Biceps femoris			
Rectus femoris			
Semimembranosus			
Semitendinosus			
Vastus intermedius			
Vastus lateralis			
Vastus medialis			

Nomenclature

For each muscle, list the nomenclature category that the muscle could be categorized by. A muscle may have more than one category.

Example

1. Triceps brachii D, F
2. Tibialis anterior _____
3. Flexor carpi radialis _____
4. Rhomboid minor _____
5. Adductor magnus _____
6. Rectus femoris _____

A. Size
B. Shape
C. Direction of Fibers
D. Location
E. Attachment (Origin/Insertion)
F. Number of Attachments
G. Action