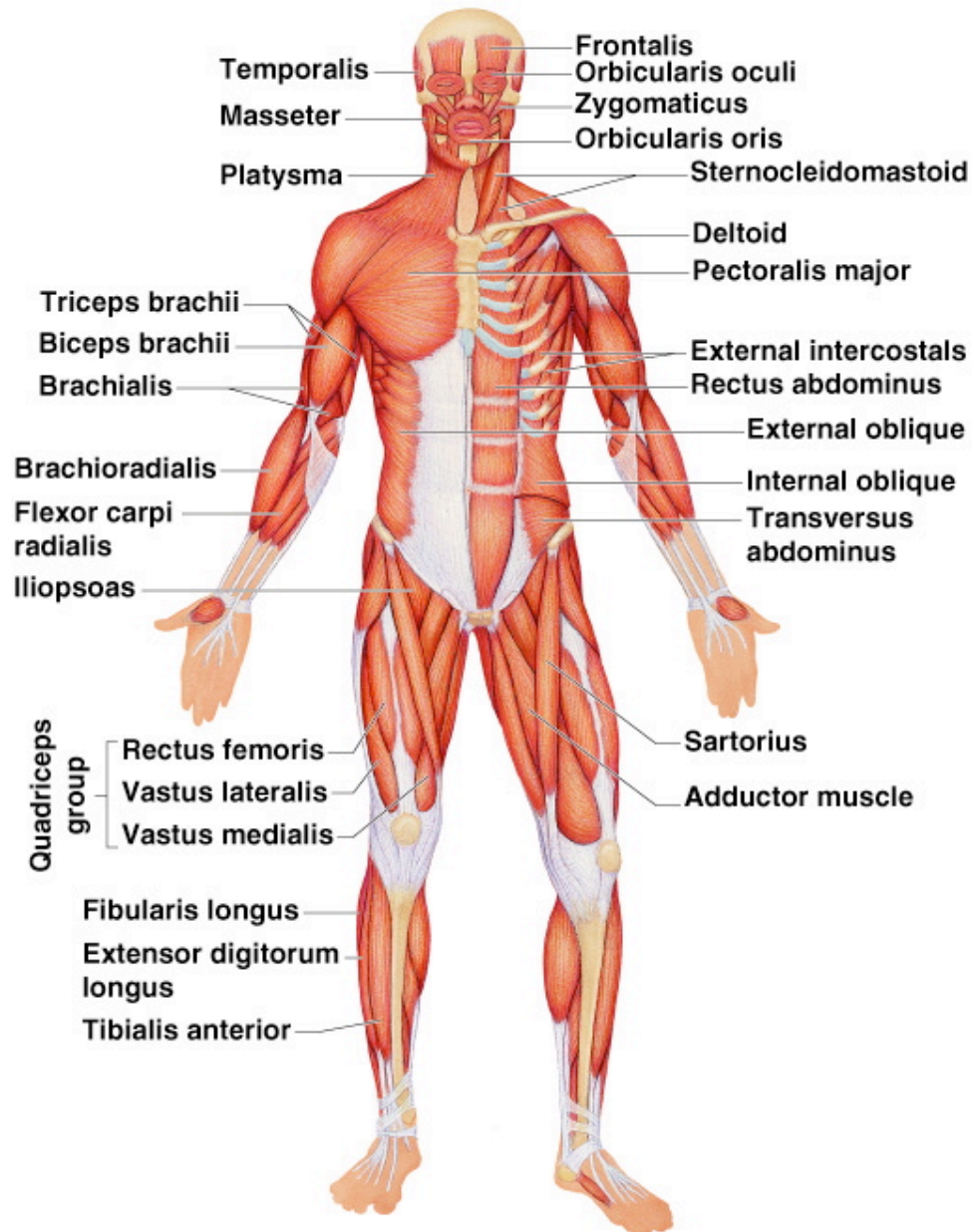


MUSCULAR SYSTEM

Two functions of the muscular system:

-
-

Types of muscles are: _____, _____ and _____



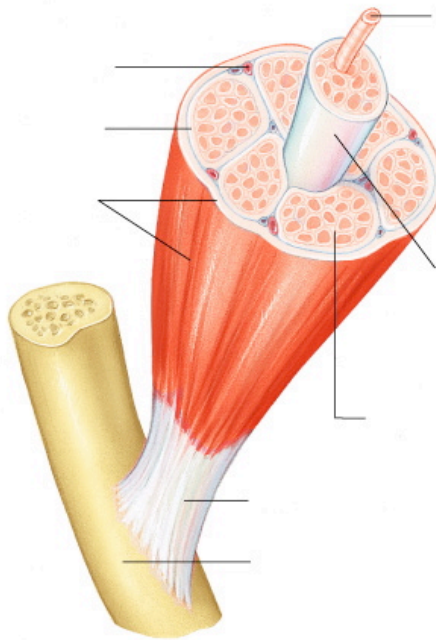
SKELETAL MUSCLE

These muscles _____ to the skeleton and are _____
reaching up to ____ foot in length. These muscles are controlled by you and are
considered _____.

Endomysium-

Perimysium-

Epimysium-



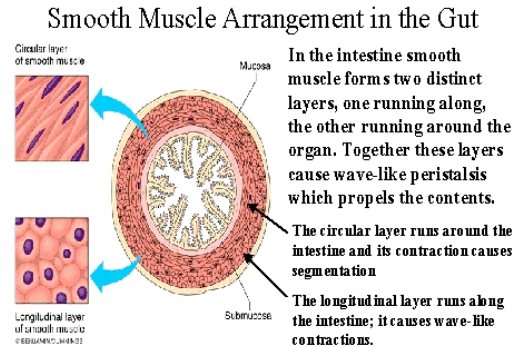
TENDONS

They are _____ and _____. They anchor the muscle to the _____.

They _____ space and move over the _____.

SMOOTH MUSCLE

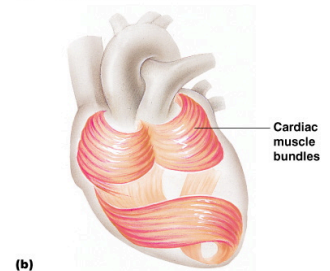
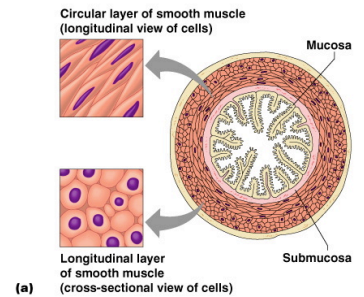
They do not contain _____ and are _____ and are involuntary. They contain _____ nucleus and are arranged in _____.



CARDIAC MUSCLE

Cardiac muscle is _____, _____ and _____.

They are only found in the _____.



MUSCLE FUNCTIONS

Produce Movement- They control almost _____ movements of the human body.

They enable us to _____ quickly to external stimuli.

Maintain Posture-Make _____ adjustments to maintain _____ despite the pull of gravity.

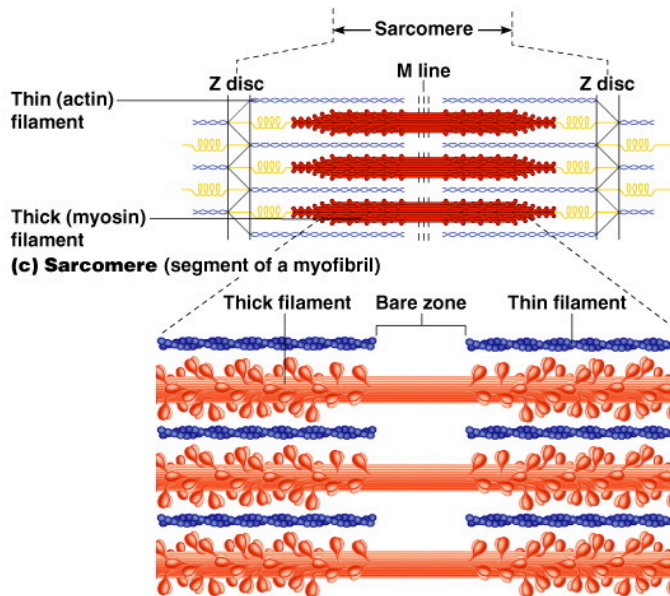
Stabilize Joints- _____ and _____ keep joints stable.

Generate Heat-_____ is the byproduct of muscle movement. Think about overheating and sweating. _____ is used to contract the muscles. $\frac{3}{4}$ of the energy leaves the body as _____. 40% of the body's mass is _____ muscle.

SKELETAL MUSCLE ACTIVITY

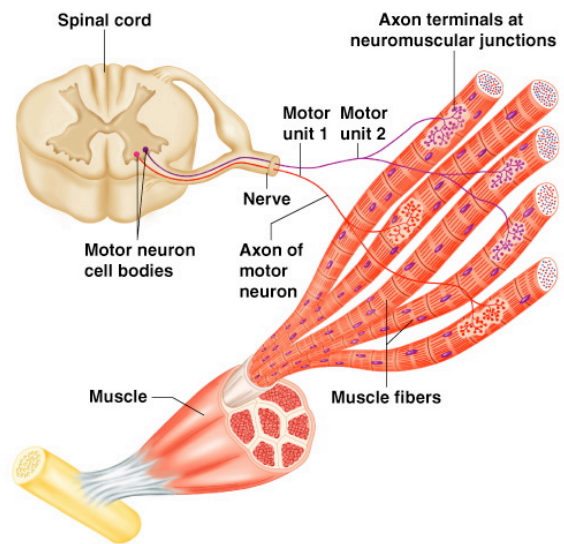
Irritability- The ability to _____ and _____ to a stimulus

Contractability- The ability to _____ when adequate stimuli are received.



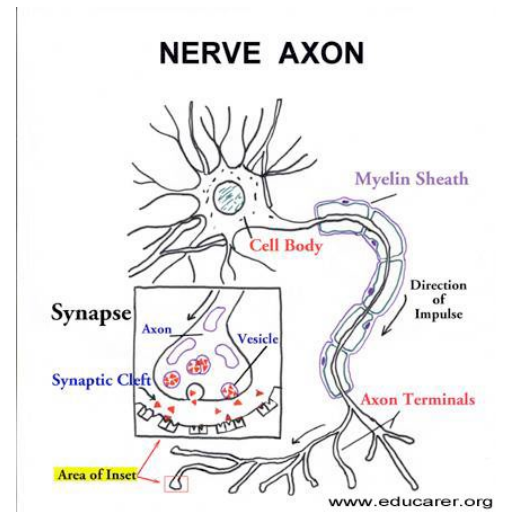
One motor unit can stimulate a few cells
or as many as _____

This happens when the end of the nerve
cell reaches the muscle and branches out.

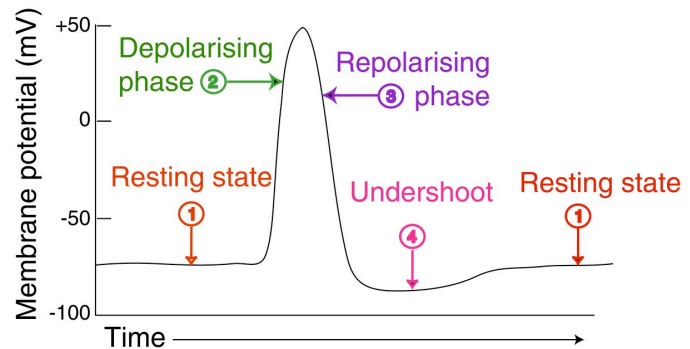


(a)

- Neurotransmitters are the _____
Messengers that are released in a _____ between
The end of the nerve cell and the muscle cell.
- The gap is called the _____.
- _____ (Ach) is the
neurotransmitter that creates an action potential.



An action potential is a _____ lasting electrical signal that can cause a response in either a _____ or _____ cell. These are considered _____.



The ACh is used up after the action potential and is converted to _____ and _____.

This prevents the continuous _____ without another nerve impulse.

When a muscle cell contracts it's considered _____. The muscle however is made of _____ individual muscle cells so it can contract with a varying degree of shortening. This is considered a _____. The exception to this idea is a _____.

The energy for muscle contraction becomes available when _____ gets hydrolyzed.

A muscle has _____ seconds worth of stored ATP. ATP has three ways to get regenerated to sustain movement.

1. Direct Phosphorylation of ADP by creatine phosphate-

_____ is stored in the muscle cell and converts _____ back to _____ in a fraction of a second.

The muscles have _____ more CP than ATP but the CP supplies are exhausted in about _____ seconds.

**** _____ is NOT used.

2. Aerobic Respiration-Oxidative phosphorylation

Will convert _____ back to _____ in the _____.

This happens nicely during light exercise or normal muscle function. Glucose and oxygen are needed, but _____ ATP's are produced.

**** _____ is required

3. Anaerobic Glycolysis and Lactic Acid Formation-

There is a creation of _____ ATP's without oxygen.

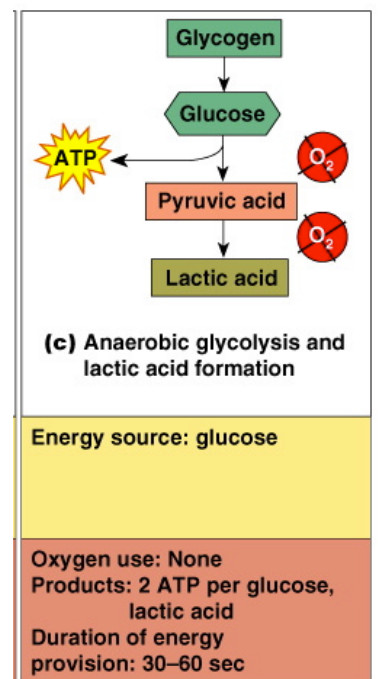
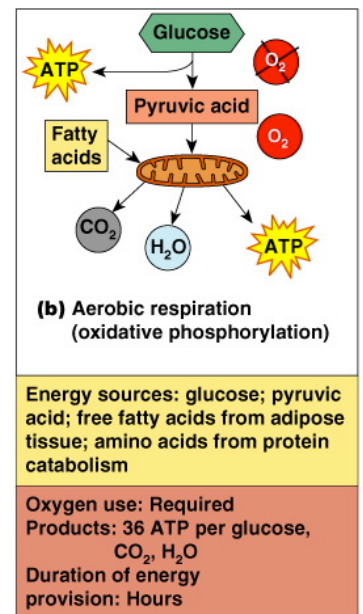
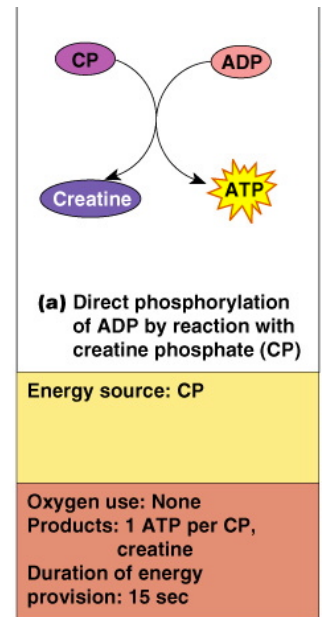
_____ is formed. If enough

oxygen is present the pyruvic acid enters the aerobic pathway and everything is OK. If there is

NOT enough _____, the pyruvic acid is converted to _____.

This causes _____ and _____.

***** _____ is NOT used.



Muscle fatigue is when the muscle is sent a stimulus but cannot _____.

The cause is a lack of _____. Marathon runners will simply _____.

_____.

The effects can be reversed with _____ and _____.

Muscle contractions come in two varieties. _____ - the muscles shorten when the myofilaments slide past one another. Examples include bending your knee or elbow. _____ - contractions without shortening. An example would be if you try to pick up _____ pounds.



Muscle tone is not consciously controlled. Some filaments are _____ while others are _____.

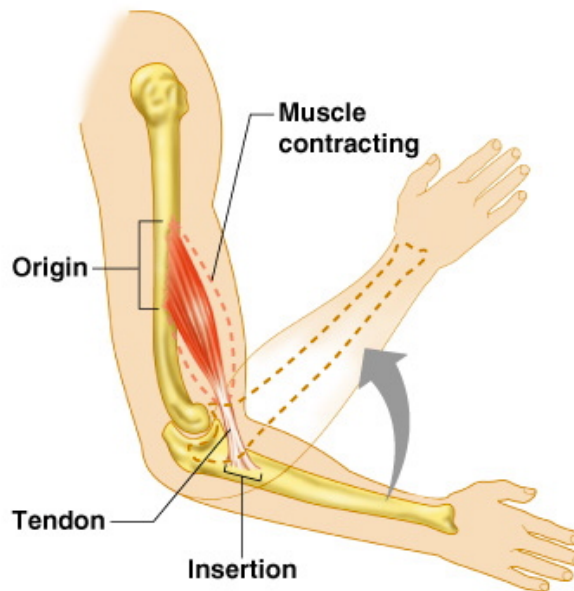
Exercise or movement are essential to good muscle health. This will build _____ and _____. Examples include:

_____ occurs because more blood reaches the cells and in turn will make more mitochondria.

Muscles can and will change size. _____ and _____

will not cause them to increase. To increase size, _____ are necessary.

All of the _____ muscles in the body are connected to bone or other connective tissue in no less than _____ places. The _____ is the attachment to the immovable or less moveable bone. The _____ is attached to the movable bone. With few exceptions, all muscles cross at least _____ joint.



DEVELOPMENTAL ASPECTS

Endocrine System-_____ influence muscle growth and mass

Lymphatic System-Protects muscles from _____.

Digestive System-Provides nutrients needed for muscle _____. The _____ metabolizes lactic acid.

Urinary System-Disposes of _____ wastes.

Nervous System-Stimulates and regulates _____ activity.

Respiratory System-Provides _____ and disposes of _____.

Integumentary System-_____ muscles by external closures.

Skeletal System-Bones provide _____ for muscle activity.

Cardiovascular System-Delivers _____ and carries away _____.