

Muscular System Tour

Name _____ Hour _____

Muscular System

There are more than _____ muscles in the Human Body!!!

Muscles are:

Needed for _____

Needed for _____

Needed for _____

Needed for _____

Needed for _____

Answer these questions by reading the following pages

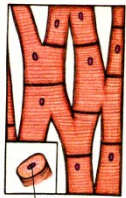
Skeletal Muscle

- ✚ Move your bones.
- ✚ Voluntary (_____)
- ✚ Over _____
- ✚ Long _____
- ✚ Stripes _____

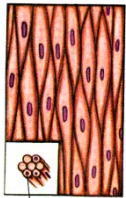
Did you see cardiac muscle under the microscope?

3 Types of Muscle

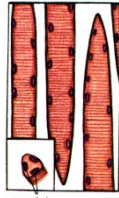
Identify the three types of muscle from the diagram:



nucleus



nucleus



nuclei

Muscle

Muscle

Muscle

Cardiac Muscle

- ✚ The muscle of the heart.
- ✚ Involuntary (_____)
- ✚ Works _____
- ✚ Strongest _____
- ✚ Only _____
- ✚ Some _____

Did you see cardiac muscle under the microscope?

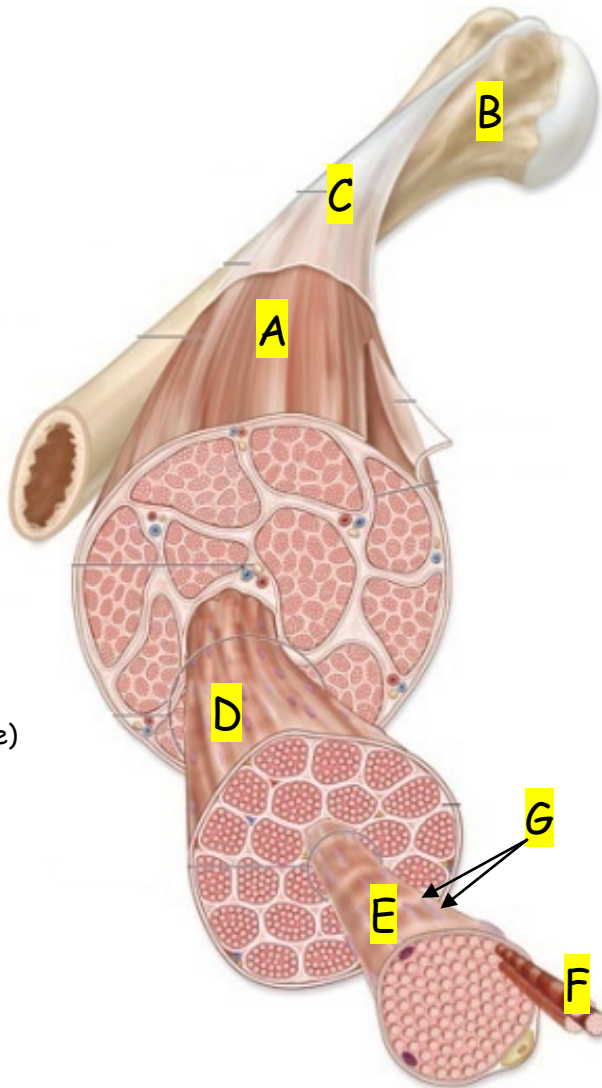
Smooth Muscle

- ✚ The muscle of _____
- ✚ Involuntary (_____)
- ✚ Contract _____
- ✚ Can remain _____
- ✚ Usually _____
- ✚ No stripes (striations)

Anatomy of a Muscle

Identify:

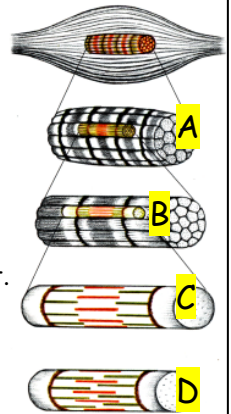
- Bone
- Tendon
- Myofibril
- Cell Nuclei
- Fascicle
- Body of Muscle
- Muscle Fiber



Which of these (above) is the muscle cell?

How a Muscle Works

- ✚ A skeletal muscle works by _____.
- ✚ The muscle can shorten as much as _____.
- ✚ Each muscle cell is made up of smaller _____.
- ✚ The _____ are in contact with a nerve ending.
- ✚ The nerve releases a chemical called a _____.
- ✚ The _____ stimulates the entire muscle to contract.



Identify: Fascicle Muscle Cell
 Myofibril Relaxed Myofibril Contracted

Muscle to Tendon to Bone

Tendons attach _____ to _____.

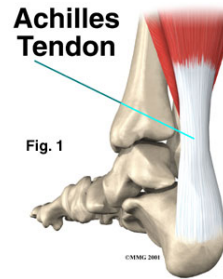
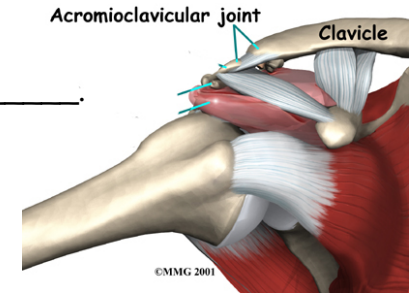


Fig. 1

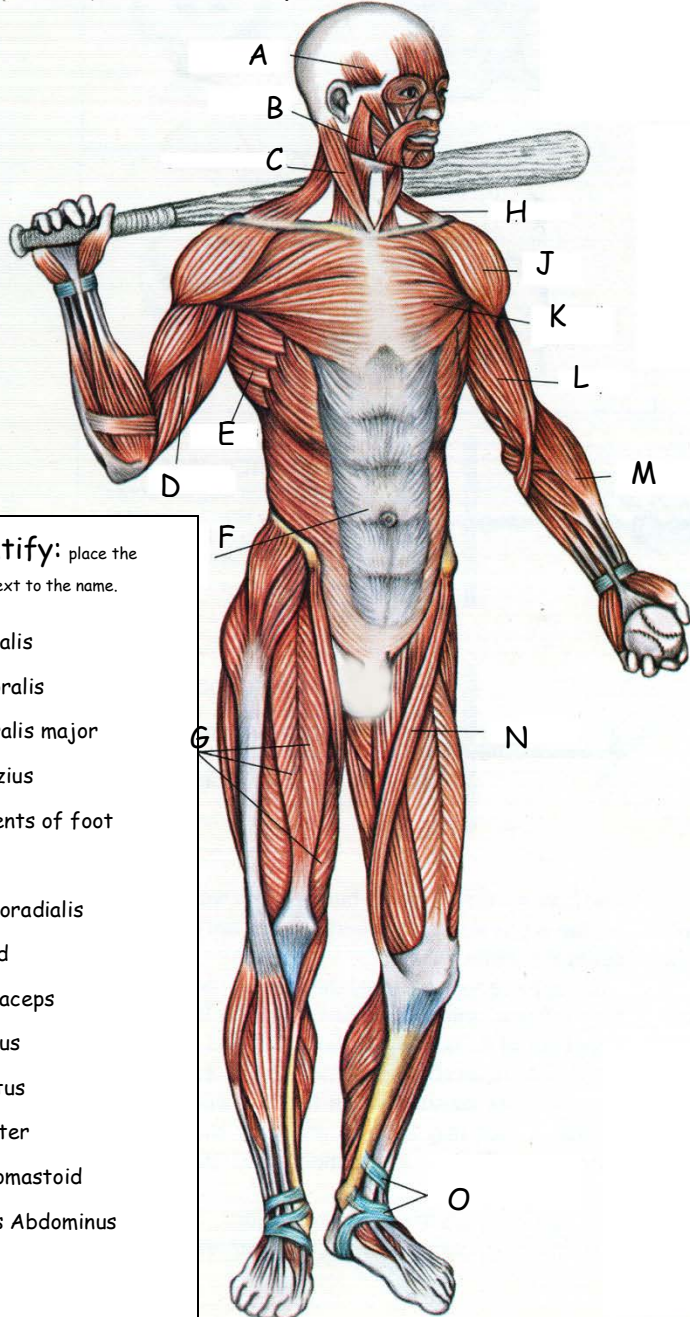


Opposites Contract ... and relax

- ✚ Muscles work in _____.
- ✚ While one muscle in the pair contracts the other must _____.



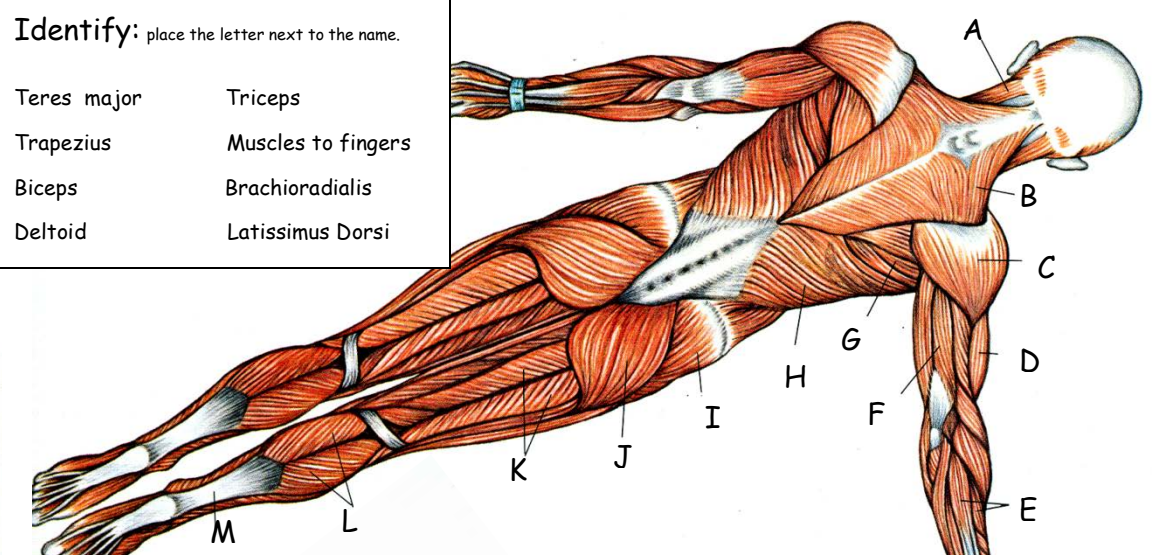
The Muscles ... a front view



Identify: place the letter next to the name.

- Brachialis
- Temporalis
- Pectoralis major
- Trapezius
- Ligaments of foot
- Biceps
- Brachioradialis
- Deltoid
- Quadriceps
- Sartorius
- Serratus
- Masseter
- Sternomastoid
- Rectus Abdominus

The Muscles ... a back view

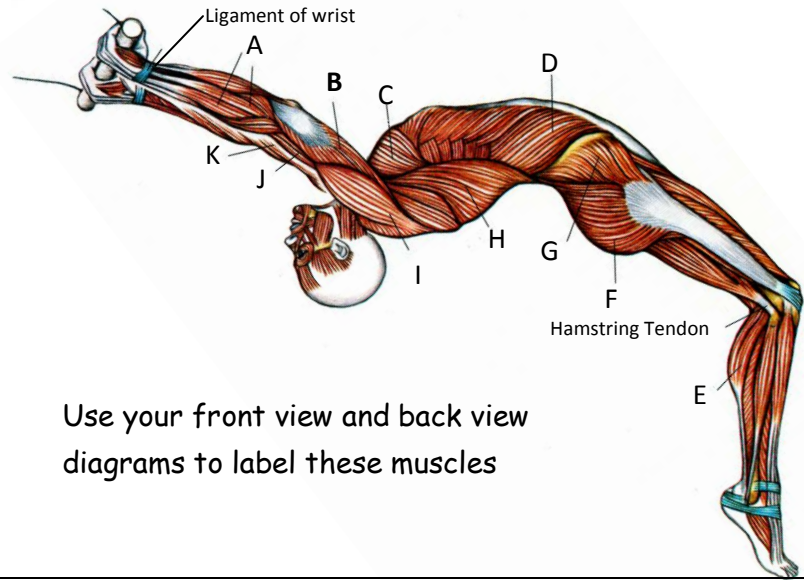


Identify: place the letter next to the name.

- Teres major
- Triceps
- Trapezius
- Muscles to fingers
- Biceps
- Brachioradialis
- Deltoid
- Latissimus Dorsi

Identify: place the letter next to the name.

- Gastrocnemius
- Gluteus maximus
- Achilles tendon
- Hamstring
- Gluteus medius



Label: place the letter next to the name.

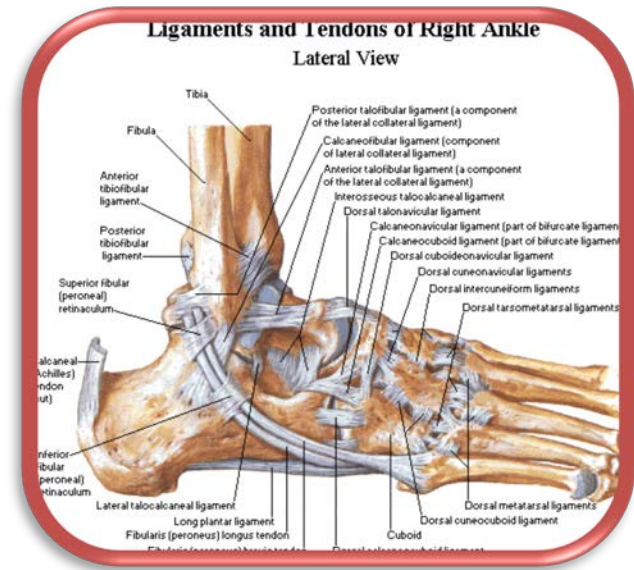
- Gluteus maximus
- Latissimus dorsi
- Pectoralis major
- Gastrocnemius
- Muscles to fingers
- Triceps
- Brachioradialis
- Deltoid
- Biceps
- Exterior oblique
- Gluteus medius

Use your front view and back view diagrams to label these muscles

Ligaments hold bones together

How many ligaments are shown in the *labeled* diagram? _____

Hint: you will need to count the *ligaments* in the diagram (not bone or tendon)



Describe the feeling of having your muscles artificially stimulated?



The Muscular System



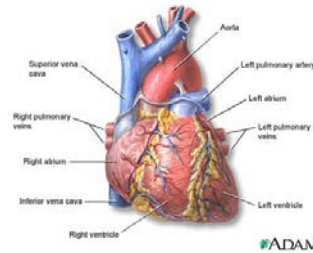
There are more than 600 muscles in the Human Body!!!

Muscles are...

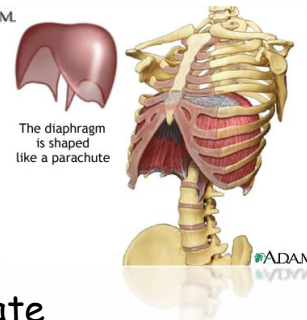
✚ Needed for all types of movement.



✚ Needed to pump blood



✚ Needed to breathe (diaphragm muscle).



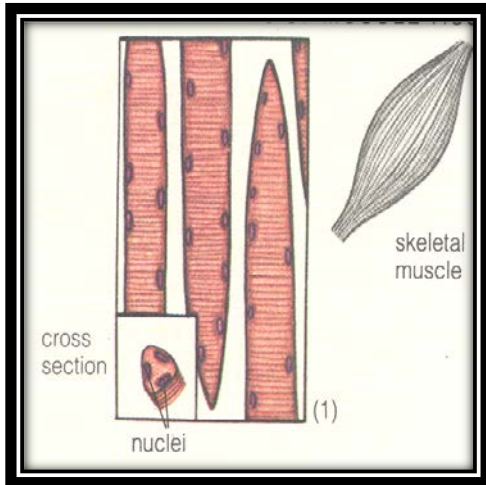
✚ Needed to produce body heat and regulate body temperature.



✚ Needed to Protect internal organs.

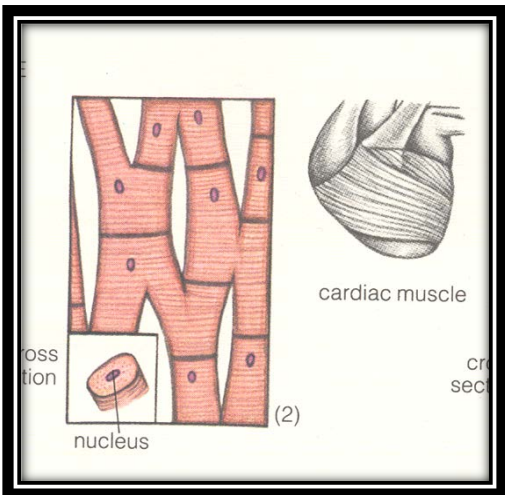


3 Types of Muscle



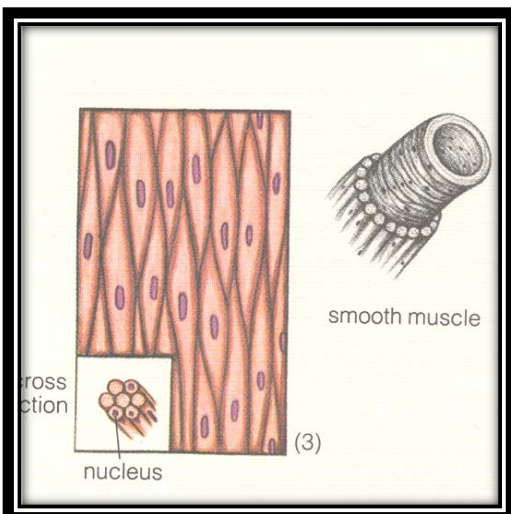
Skeletal Muscle:

- ✚ Voluntary (under your conscious control)
- ✚ Movement of your bones, face, eyes, etc.



Cardiac Muscle:

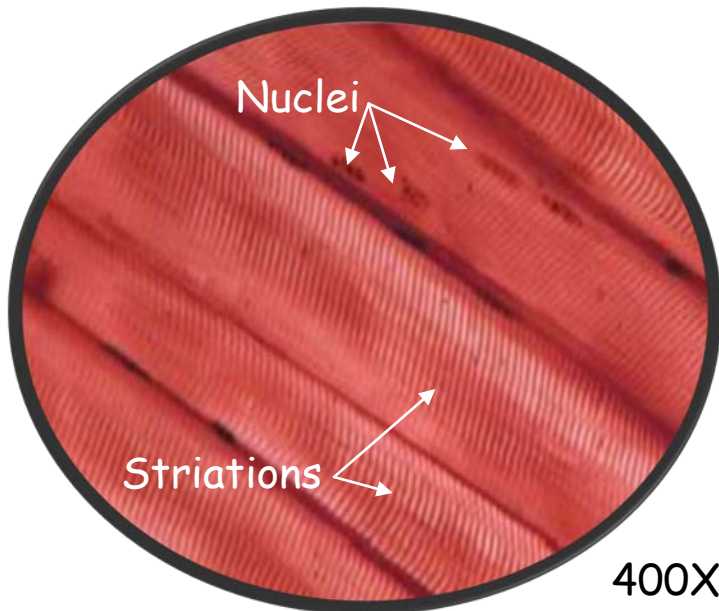
- ✚ Involuntary (not under your conscious control)
- ✚ Movement of your heart and certain blood vessels.



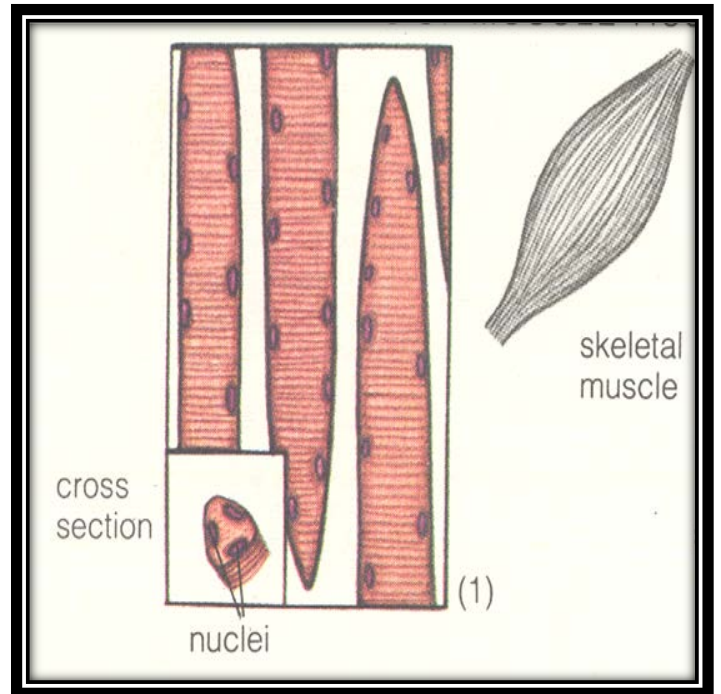
Smooth Muscle:

- ✚ Involuntary (not under your conscious control)
- ✚ Movement of your intestines, esophagus, and other internal organs.

Skeletal Muscle



400X
(High Power)



+ Move your bones (also your face, eyes etc)

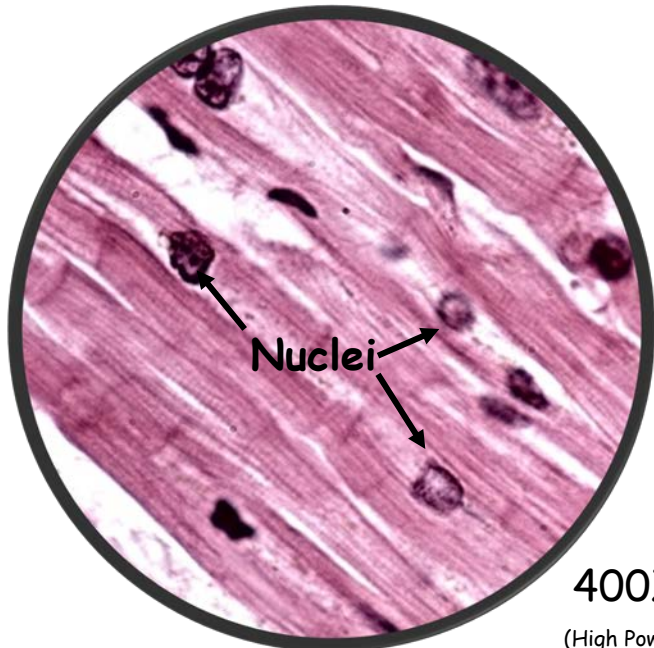
+ Voluntary (you can control them)

+ Over 400 skeletal muscles in your body

+ Long cells with several nuclei (along edges of cell)

+ Stripes called striations in cell (visible in high power)

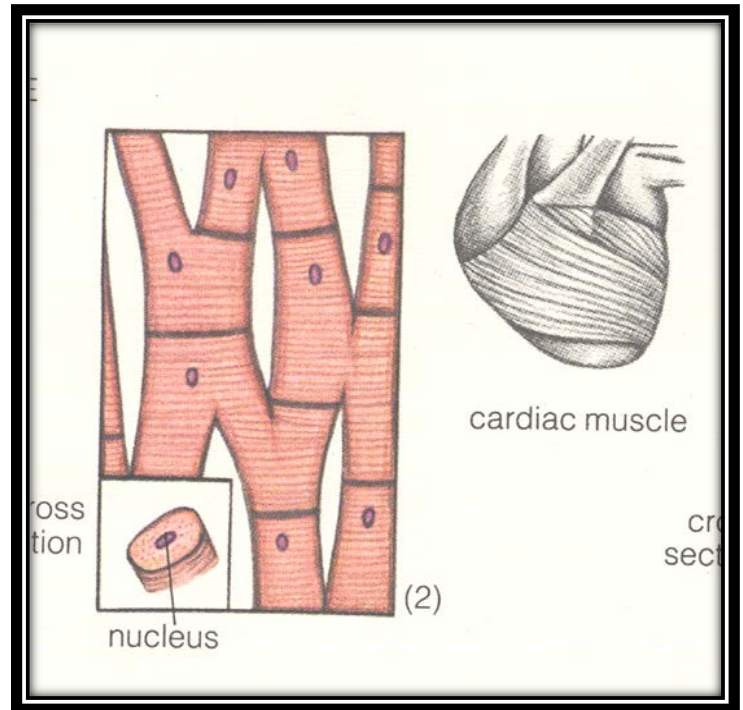
Cardiac Muscle



400X

(High Power)

Striations cannot be easily seen at this magnification



✚ The muscle of the Heart

✚ Involuntary (you cannot control them)

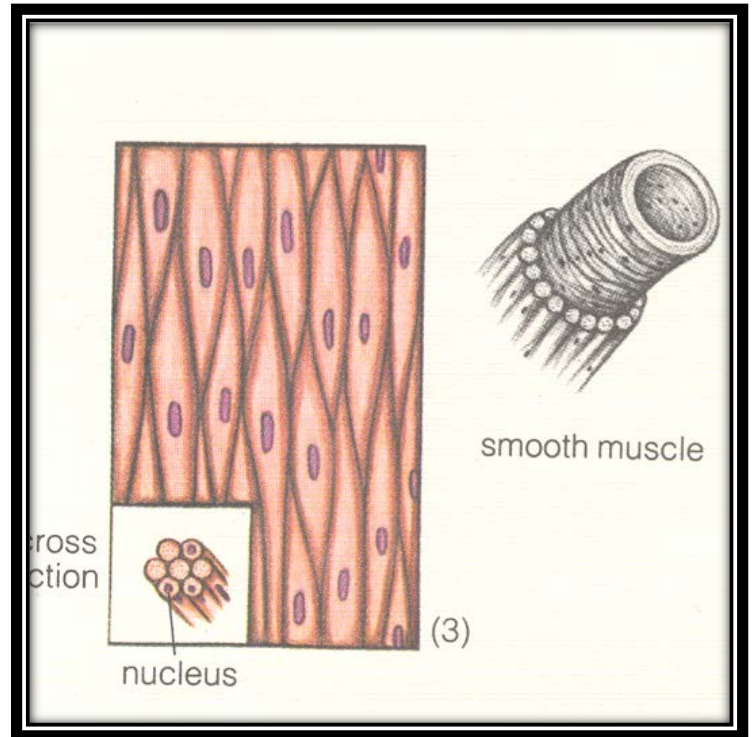
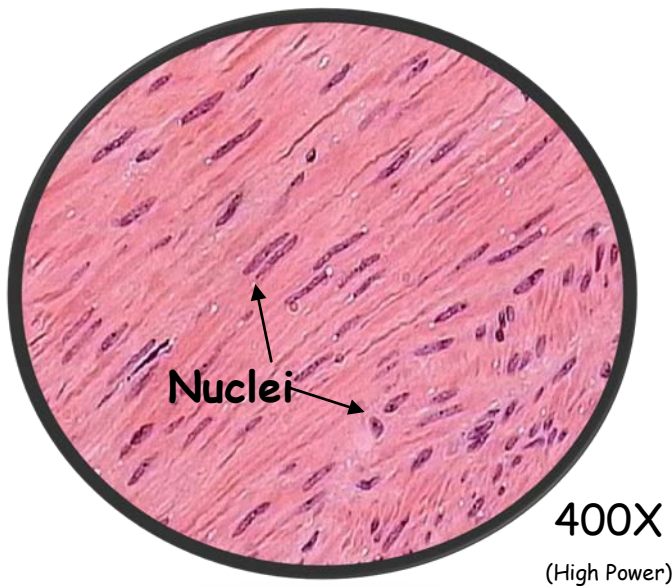
✚ Works 24 hours a day every day of your life!!!

✚ Strongest type of muscle

✚ Only one nucleus per cell (usually in center of cell)

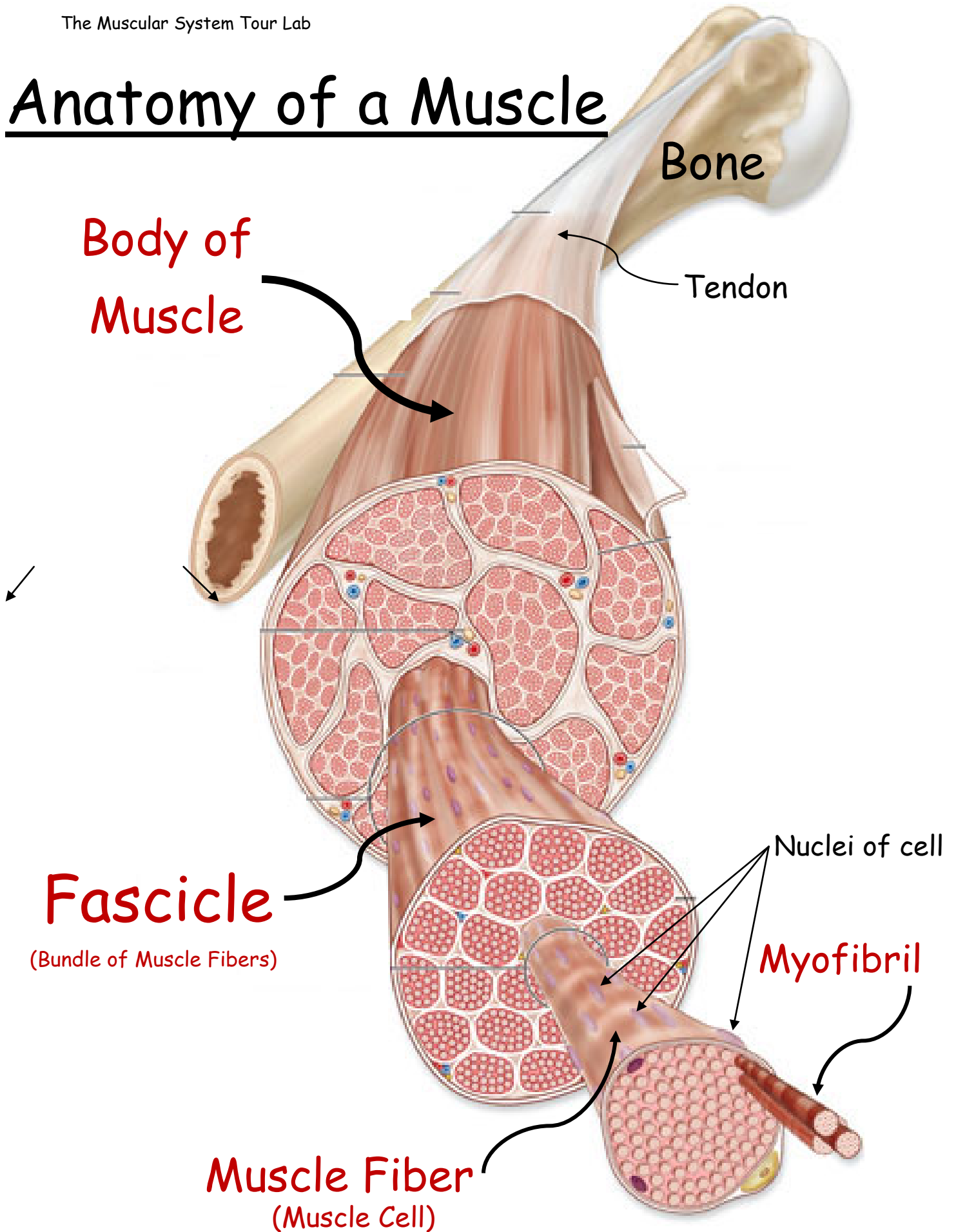
✚ Some striping (striations) but not as much as skeletal muscle

Smooth Muscle



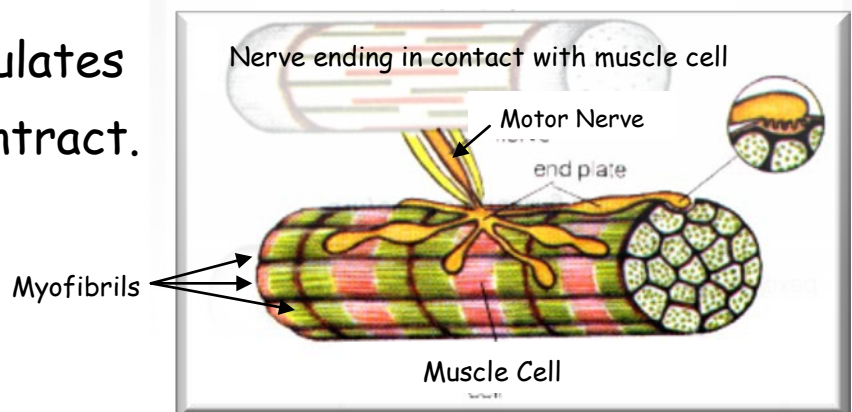
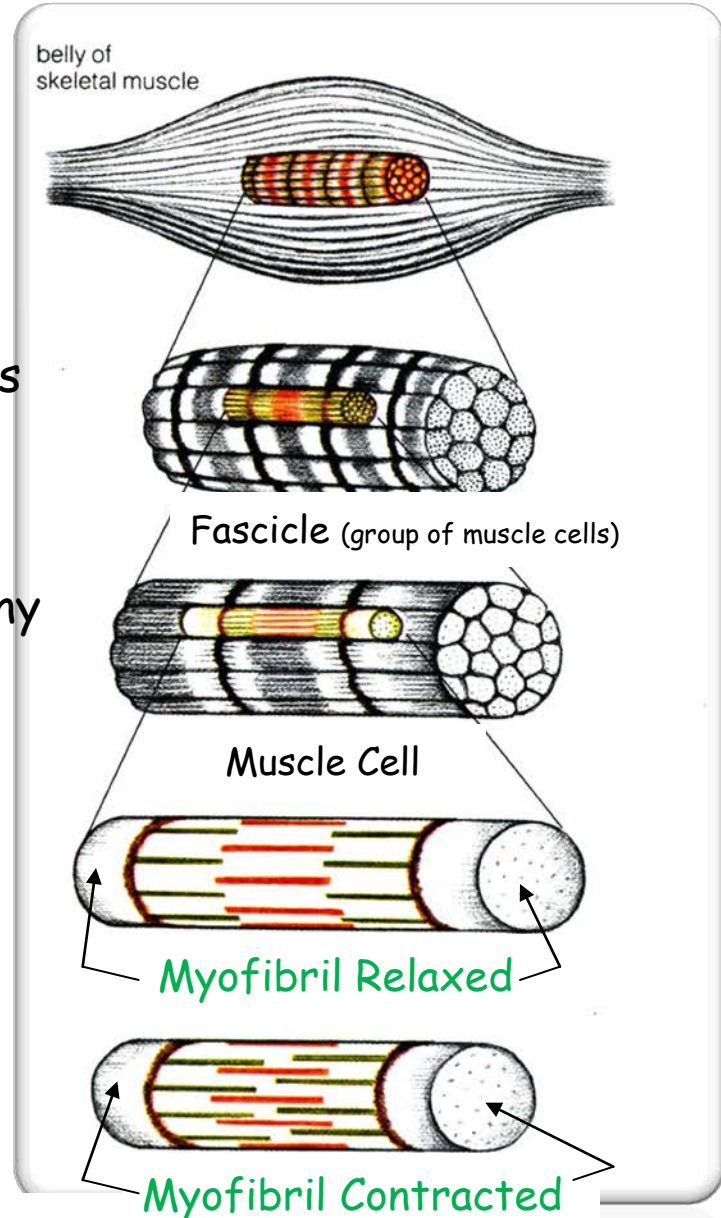
- ✚ The muscles of the esophagus, stomach, intestines and other internal organs
- ✚ Involuntary (you cannot control them)
- ✚ Contract slowly and smoothly
- ✚ Can remain contracted for long periods of time
- ✚ Usually one nucleus per cell (usually in center of cell)
- ✚ No striping (striations)

Anatomy of a Muscle

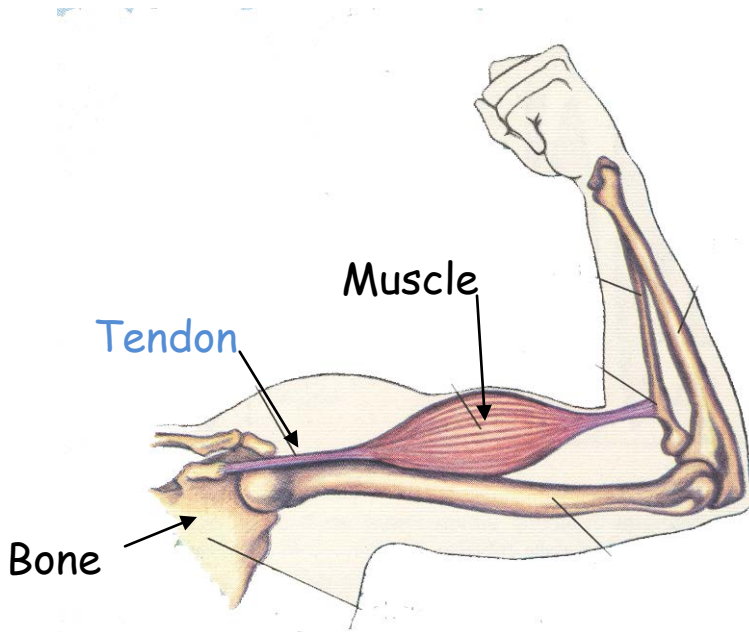


How a Muscle Works

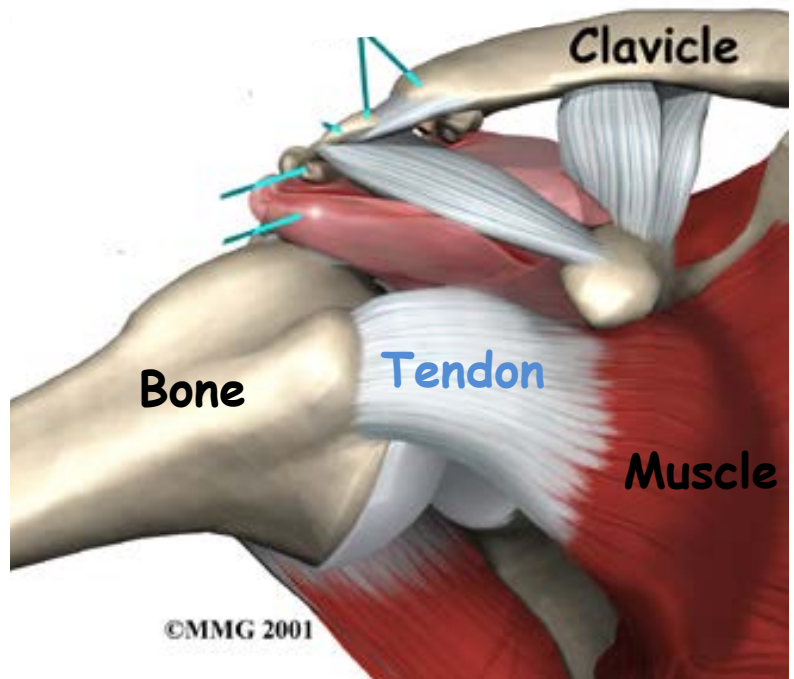
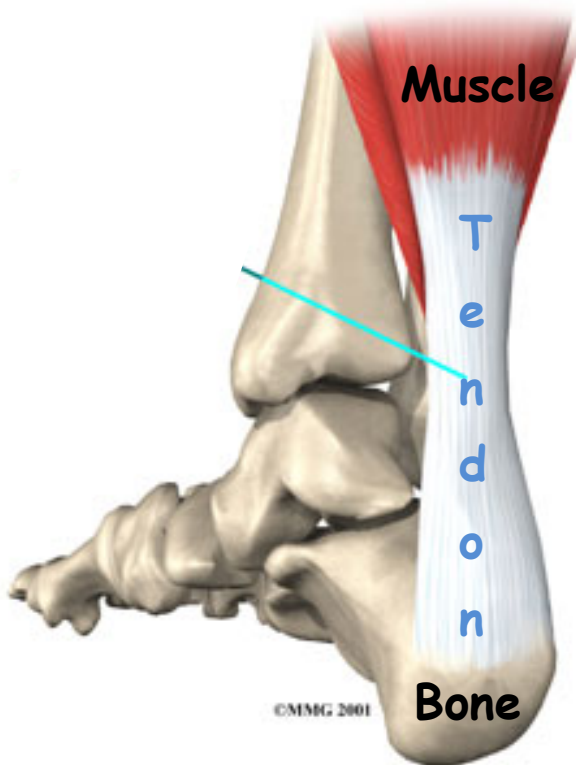
- ✚ A skeletal muscle works by **CONTRACTING** (getting shorter).
- ✚ The muscle can shorten as much as 1/3 its resting length.
- ✚ Each muscle cell is made up of many smaller **MYOFIBRILS**
- ✚ The **MYOFIBRILS** are in contact with a nerve ending.
- ✚ The nerve releases a chemical called a **NEUROTRANSMITTER**.
- ✚ The Neurotransmitter stimulates the entire muscle cell to contract.



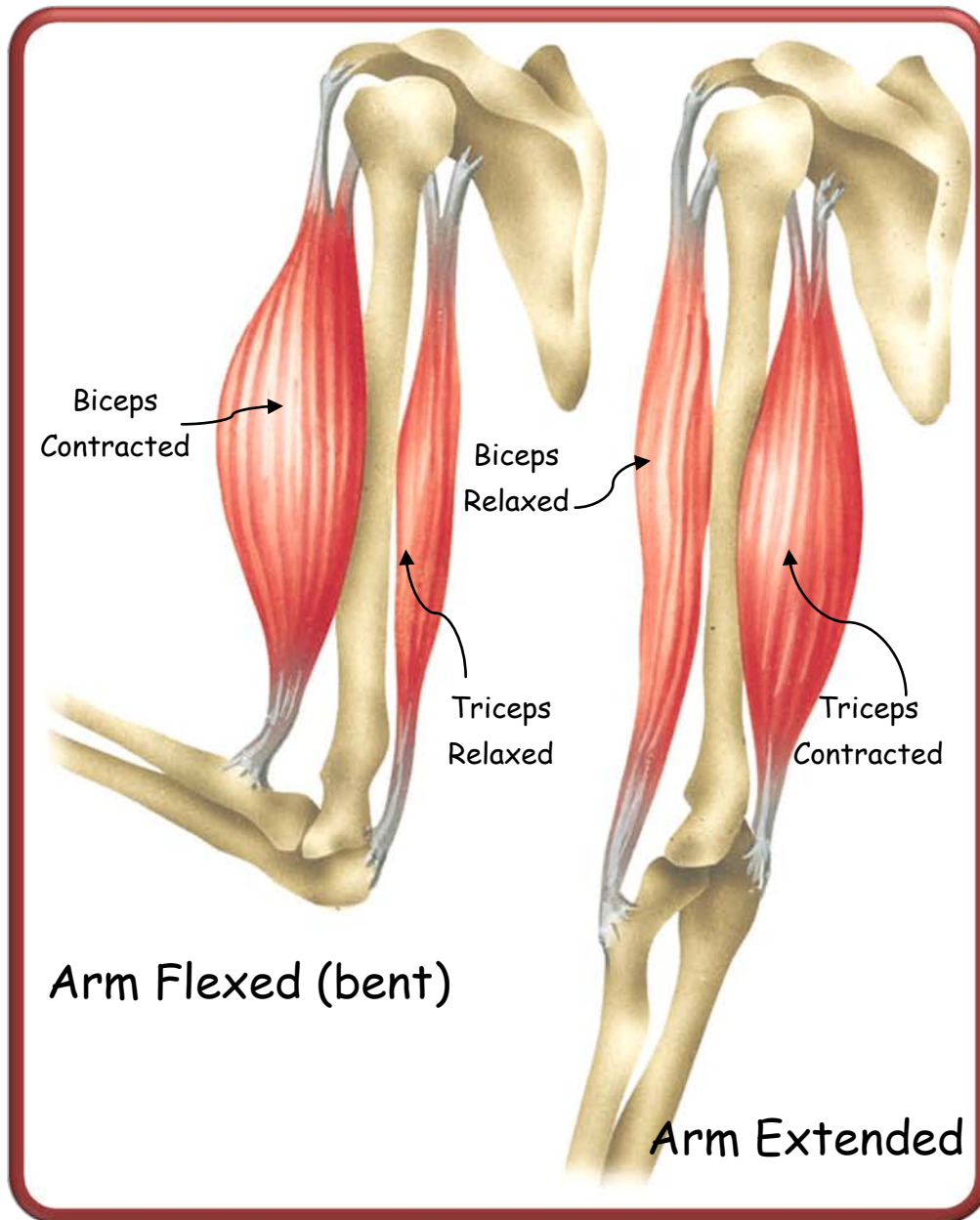
Muscle to Tendon to Bone



TENDONS
Attach
Muscle to Bone

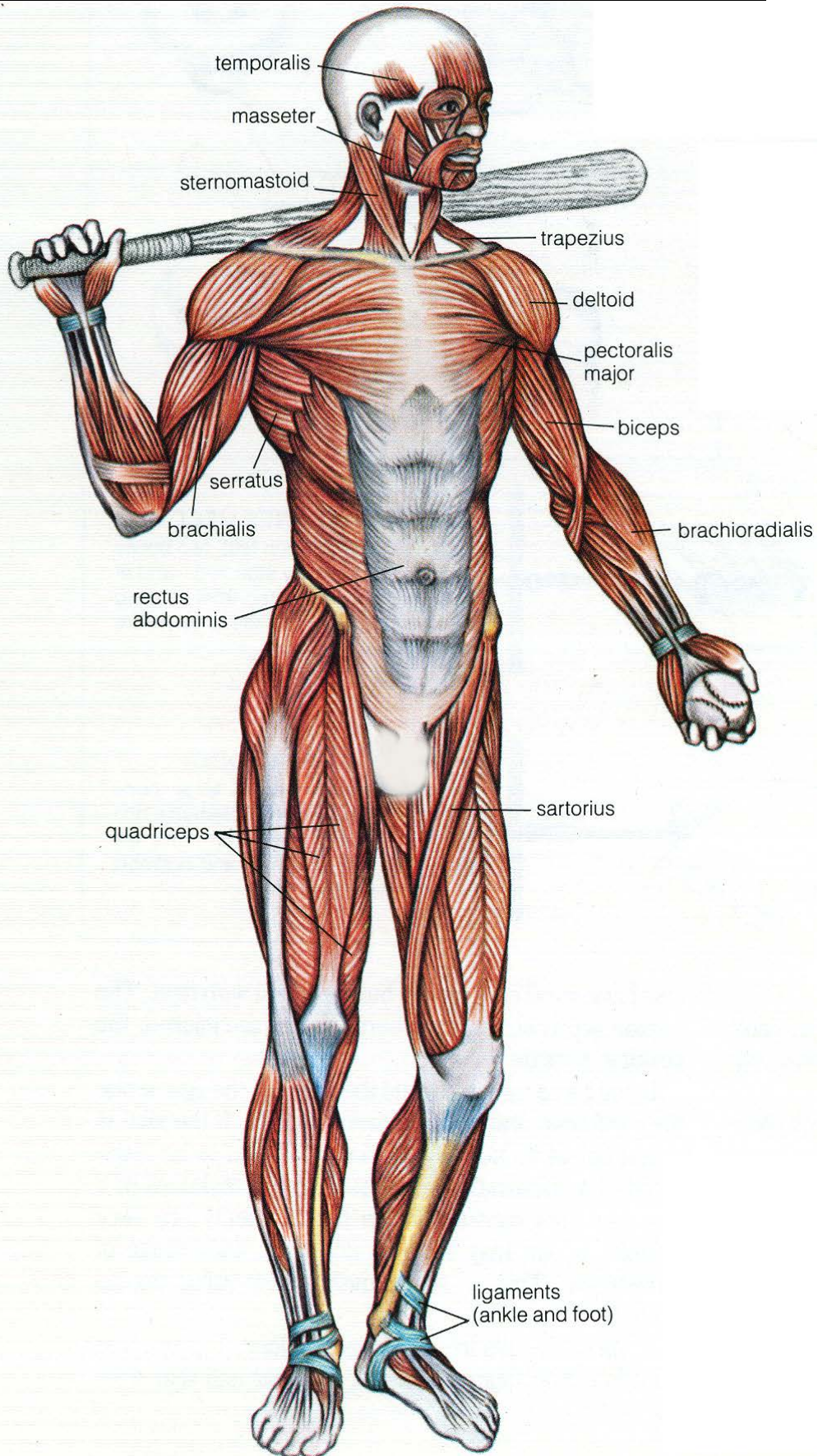


Opposites Contract ... and Relax

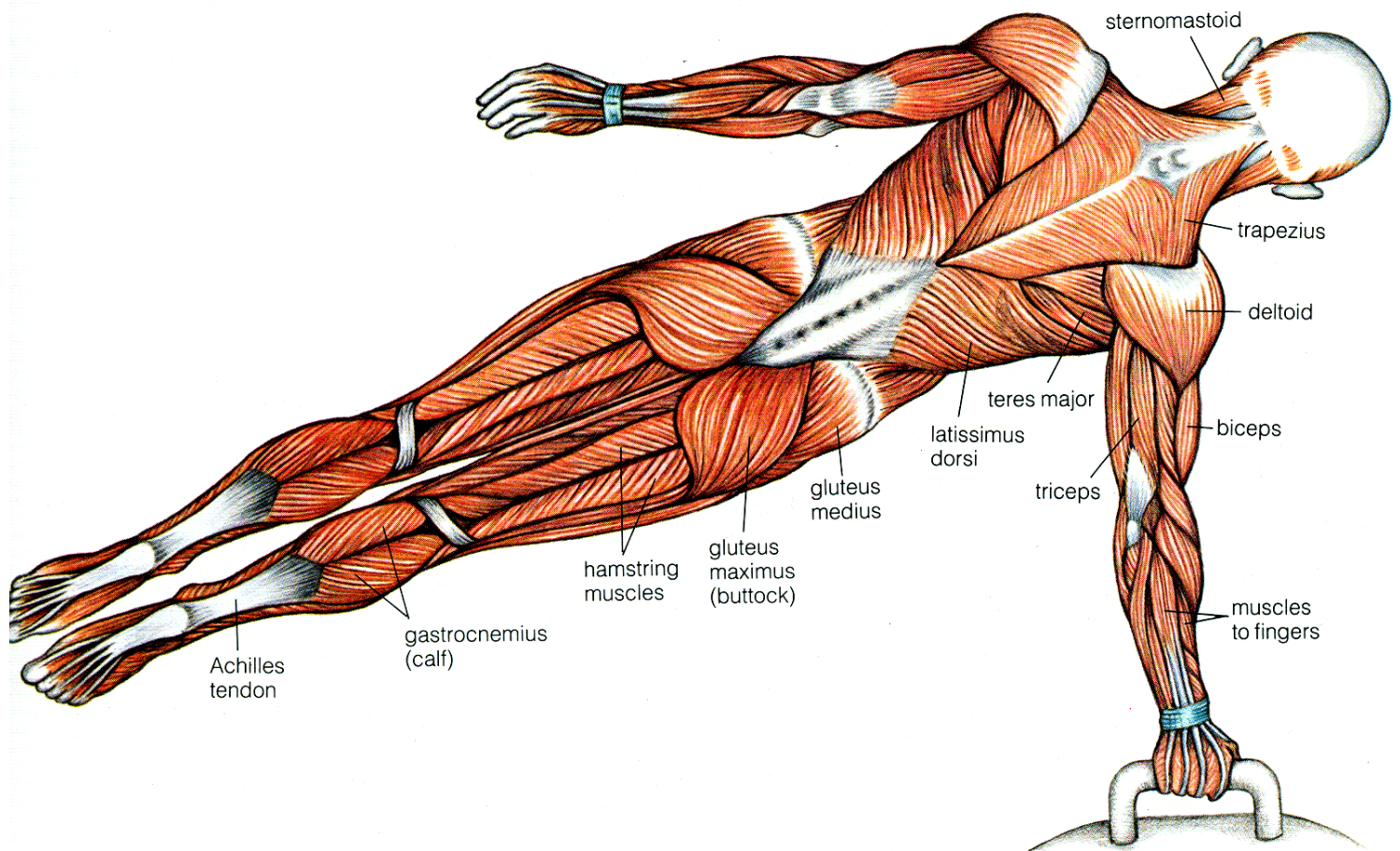


- ✚ Muscles work in pairs. The biceps muscle will bend the arm at the elbow and the triceps muscle will straighten the arm.
- ✚ While one muscle in the pair contracts the other must relax.

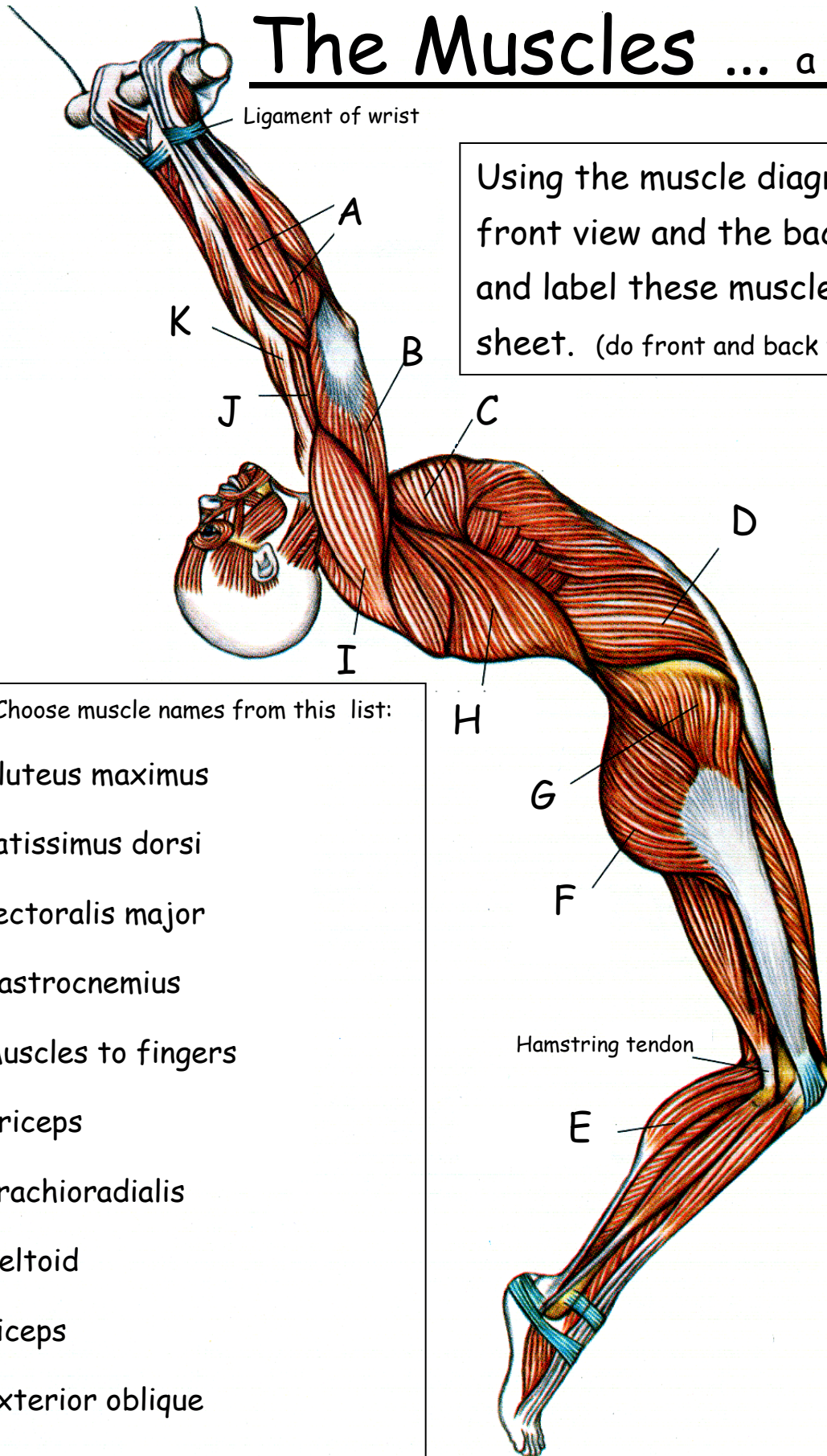
The Muscles ... a front view



The Muscles ... a back view



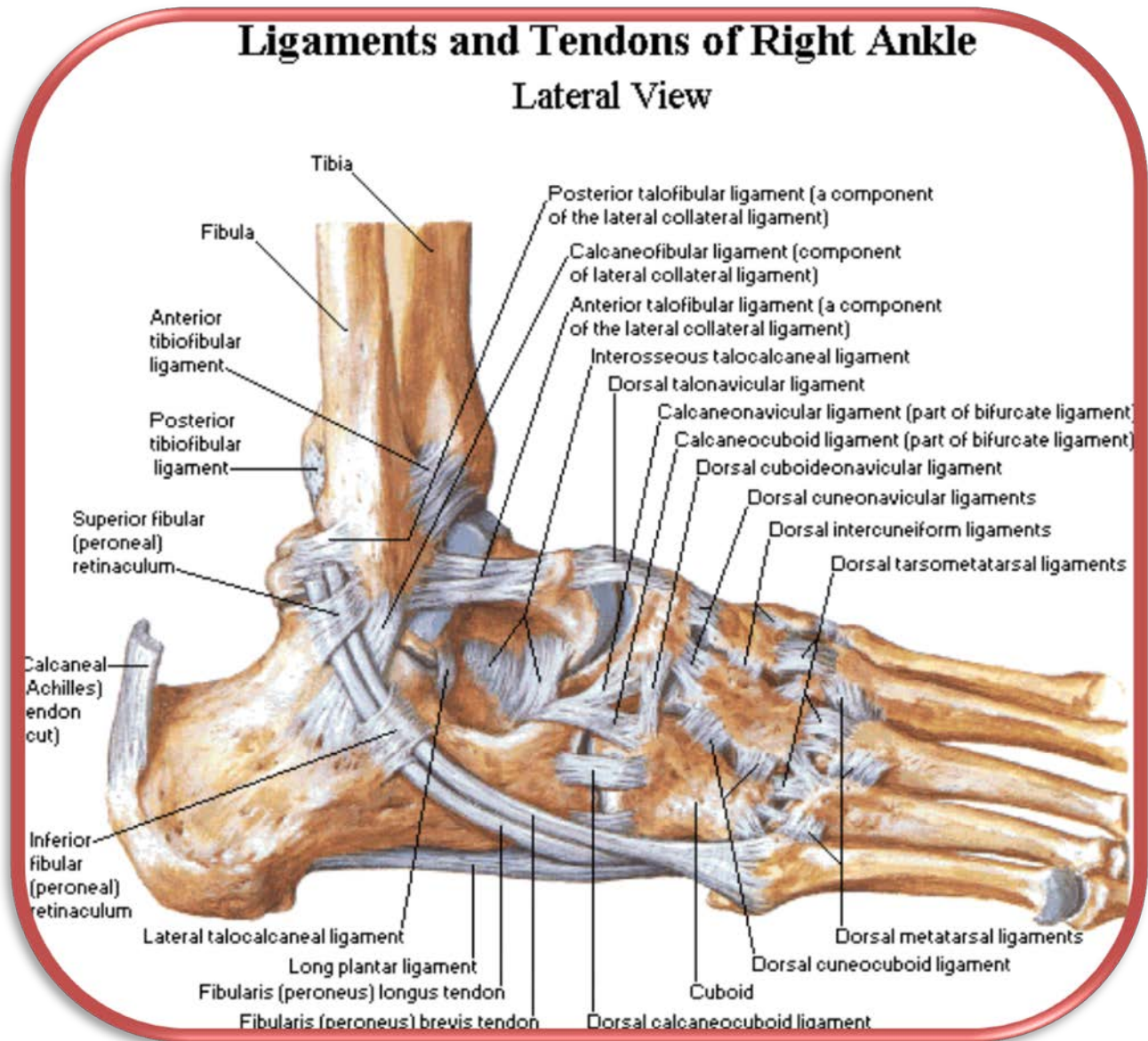
The Muscles ... a side view



Using the muscle diagrams for the front view and the back view, identify and label these muscles on your lab sheet. (do front and back view stations first)

- Choose muscle names from this list:
- Gluteus maximus
 - Latissimus dorsi
 - Pectoralis major
 - Gastrocnemius
 - Muscles to fingers
 - Triceps
 - Brachioradialis
 - Deltoid
 - Biceps
 - Exterior oblique
 - Gluteus medius

Ligaments hold bones together

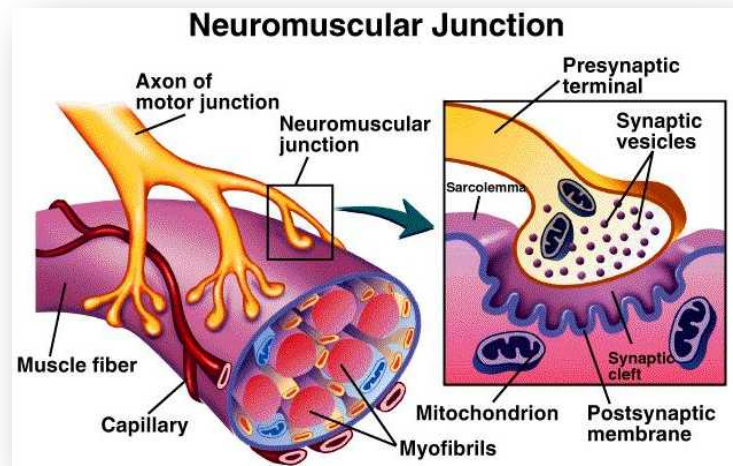


Muscle Stimulation

Answer questions on lab answer sheet

Your muscles contract when a mild electric current comes in contact with the myofibrils in the muscle cells. The chemicals in your body produce the electricity to cause a muscle to contract.

If muscles are stimulated from an artificial electrical signal, they will contract but without your conscious control. This is what a **MUSCLE STIMULATOR** does.



Do this:

Go see your teacher for a shocking demonstration.

(for the next 30 seconds we are in control of your muscles)



