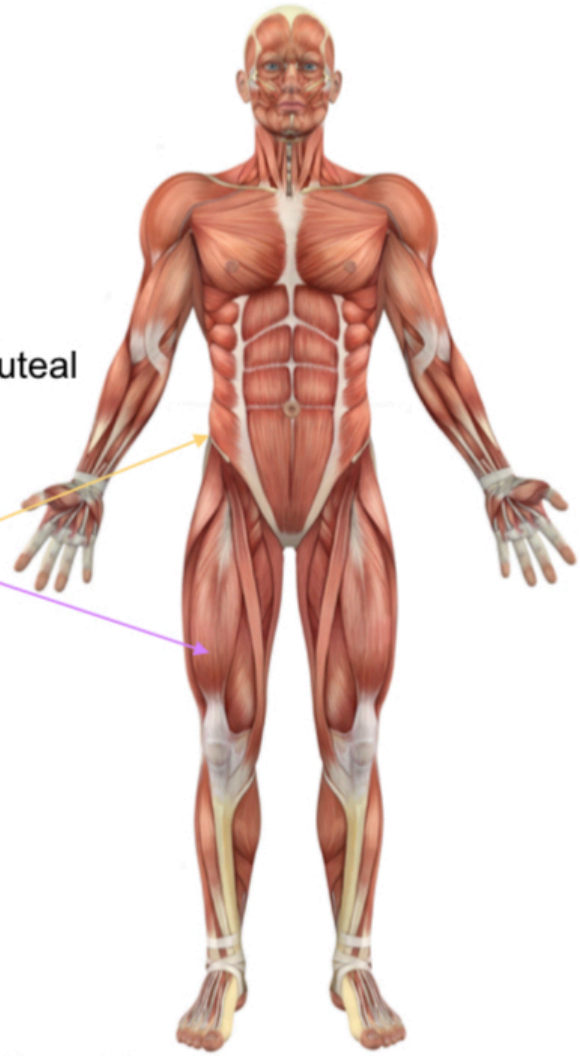
Station 1

How Muscles are Named

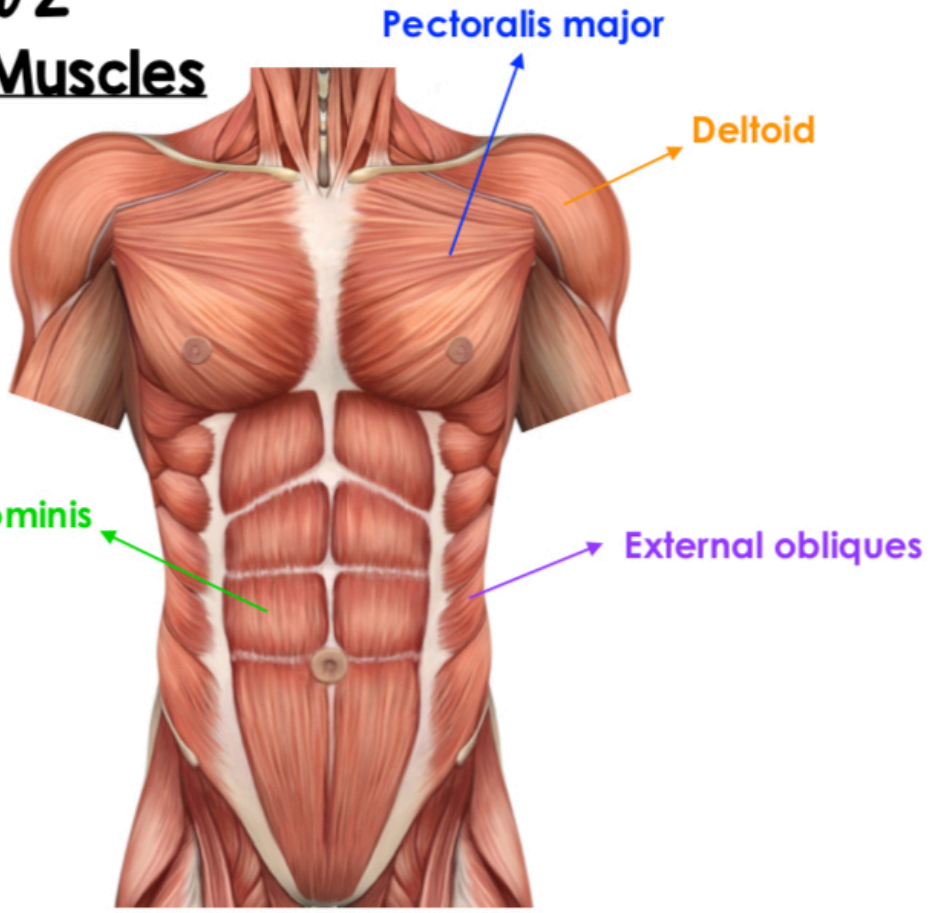
There are more than 600 skeletal muscles in the human body. We will mainly be looking at the superficial muscles only, but you should appreciate the complexity of this magnificent organ system. There are a few patterns that can be seen in how skeletal muscles are named that may help you remember them:

- **Muscle location**
  - Ex. The temporalis muscle in the head lies over the temporal bone.
- **Muscle shape**
  - Ex. The deltoid muscle in the shoulder is shaped like a triangle (deltoid).
- **Muscle size**
  - *Maximus* = largest; *minimus* = smallest
  - *Longus* = long; *brevis* = short
  - Ex. Gluteus maximus and gluteus minimus are the largest and smallest gluteal muscles.
- **Direction of muscle fibers**
  - *Rectus* = fibers run parallel to the reference point
    - Ex. **Rectus femoris** is a straight thigh muscle that runs along the femur.
  - *Oblique* = fibers run indirectly or at a slant to the reference point
    - Ex. **External oblique** muscles in the abdomen.
  - *Transversus* = fibers run at right a right angle to the reference point
- **Number of origins**
  - Ex. The biceps have two "heads" attached at different origins.
  - Ex. The triceps have three "heads" attached at different origins.
- **Muscle action**
  - Muscles named for the movement they produce.
  - Ex. The adductor longus muscle adducts the thigh.
- **Location of the attachments**
  - When muscles are named based off their points of origin (always listed first) and insertion.
  - Ex. The sternocleidomastoid is a neck muscle that originates in the sternum and clavicle, and inserts into the mastoid process of the temporal bone in the head.



Station 2

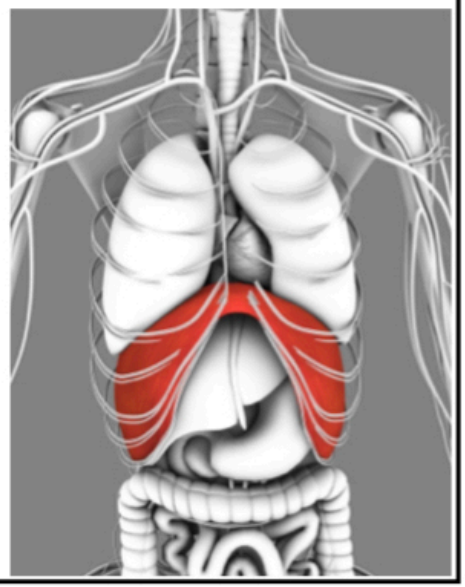
Upper Body Muscles



Muscles of the shoulder: Most of the muscles that act on your humerus actually originate in the pectoral girdle. For example, your **pectoralis major** is a prime mover muscle in flexion of the arm and its antagonist the **latissimus dorsi**, (of the lower back, pictured in Station 5), the prime mover in extension of the arm. The thick **deltoid** muscles extend over the shoulder and are also essential in movements of the humerus.

Muscles of the abdominal wall: These muscles help to protect the visceral organs, which don't have the protection of the bony rib cage like those in the thoracic cavity. The key muscles are the **external obliques** and the **internal obliques**, just deep of the external. Even deeper are the **transversus abdominis**, the deepest of the abdominal muscles. The **rectus abdominis** are the muscles that make it possible (or not) for you to have a 6-pack.

Muscles of the thoracic cavity: The external intercostals, internal intercostals and the diaphragm are key muscles deeper in your thoracic cavity that are critical for breathing. The prime mover for inspiration (inhalation) is the **diaphragm** while the external intercostals act as synergists that aid in inspiration. The internal intercostals are antagonistic to the external. When you inhale, your diaphragm contracts and flattens as it moves downward, making room for your lungs to expand. The external intercostals assist by helping your rib cage move outward and upward when you inhale. The diaphragm also forms a muscular partition between the thoracic and abdominopelvic cavities.



Muscles of the pelvic floor and perineum: We will not cover these muscles in this unit, but know that they exist and are essential for supporting the abdominopelvic organs and aiding in excretion.

Station 3

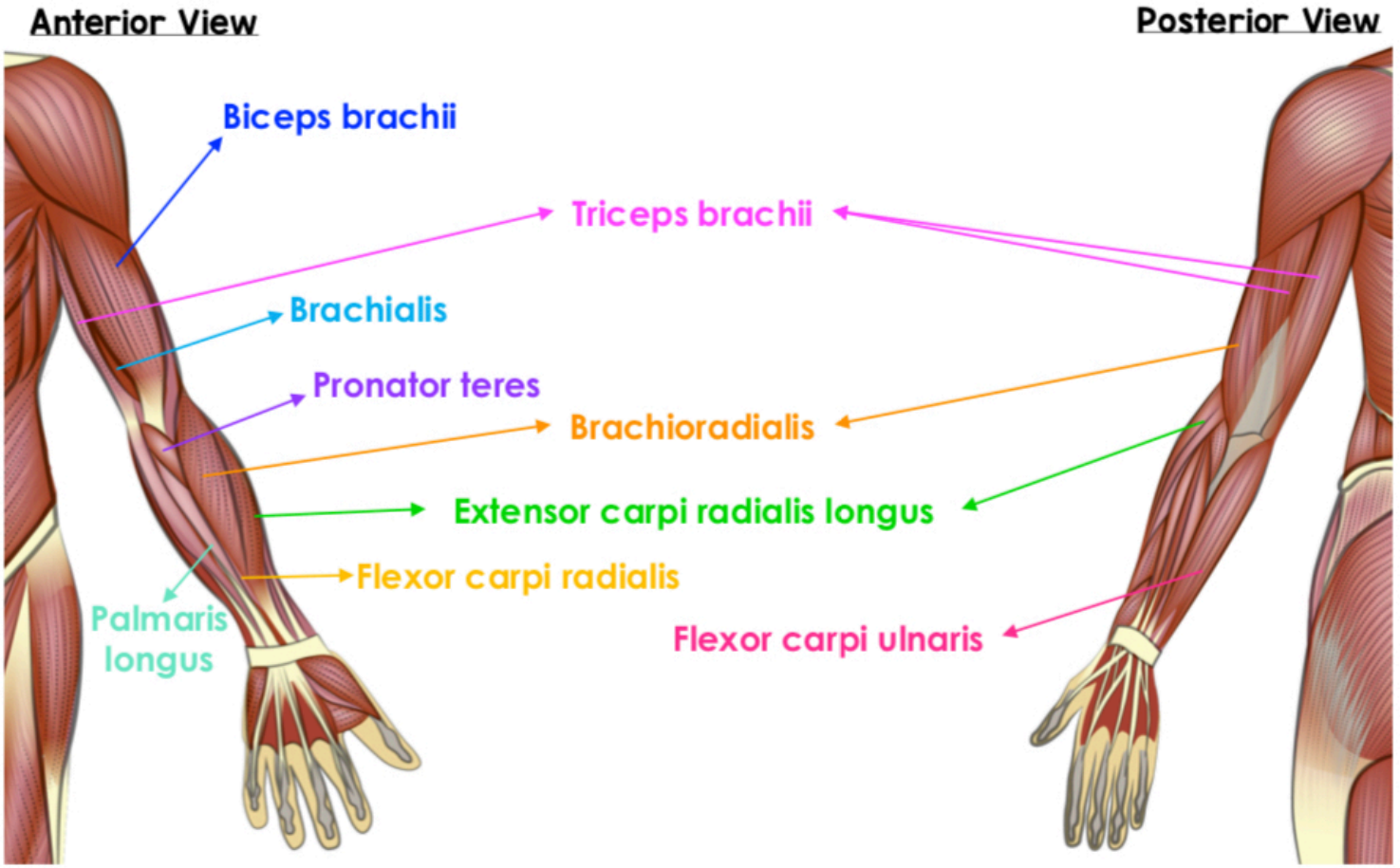
Upper Limb Muscles

These muscles cross the elbow joint and insert on the forearm bones. All of the anterior arm muscles aid in flexing the forearm. The **biceps brachii** (the muscles that bulge when you flex) and the **brachialis** underneath the biceps (which acts as a bridge between the humerus and ulna) contract simultaneously during flexion. The **brachioradialis** is a synergist muscle for forearm flexion.

The **flexor carpi ulnaris** flexes and adducts your hand while the **flexor carpi radialis** flexes and abducts it.

The **palmaris longus** helps with wrist flexion, but not everyone has one! Touch your pinky finger to your thumb and see if a tendon protrudes from your wrist. If so, this muscle is present! If you not, you are part of the less than 16% of the population that is missing this muscle!

The **pronator teres** rotates your forearm.

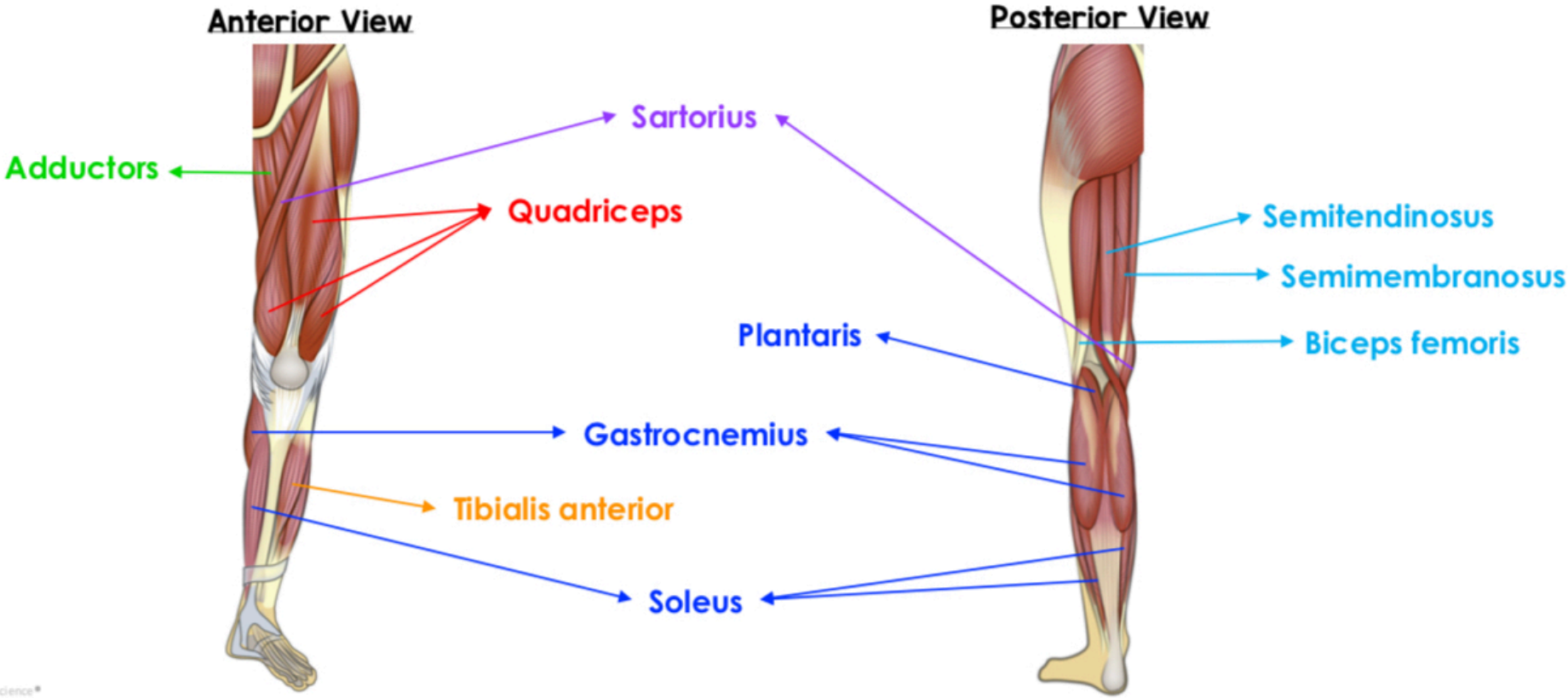


The main arm muscle for extension is the **triceps brachii**. The **extensor carpi radialis longus** (and brevis) muscles help abduct and extend your hand at the wrist joint.

Station 4

Lower Limb Muscles

Movements of the thigh occur at the hip joint and are done by muscles anchored to the pelvic girdle. Movements of the leg (remember in anatomy that is considered the area between the knee and ankle) occur at the knee joint. The longest skeletal muscle in the human body is the **sartorius** which helps flex, abduct, and laterally rotate your thigh. The **adductors** *(magnus, longus, and brevis)* make up your inner thighs, and can be most easily felt when doing a butterfly stretch. When someone says they have a "pulled groin" they are referring to an adductor muscle. The most powerful muscle in the body is the **quadriceps femoris** in the thigh *(vastus lateralis, vastus medialis, vastus intermedius, and rectus femoris.)* They are the major extensors of the knee and we need them for jumping, climbing, running, and standing from a seated position. The quadricep muscles are antagonized by the **hamstrings** *(biceps femoris, semimembranosus, semitendinosus)* in the posterior thigh. Your hamstrings are prime movers for thigh extension and leg flexion. The **calf muscles** *(gastrocnemius, soleus, and plantaris)* are key for movement in the ankle, foot, and toes. The **tibialis anterior** makes up your shin and is the prime mover in dorsiflexion (allowing you to flex your ankle so that your foot moves towards your knee.)



Station 5

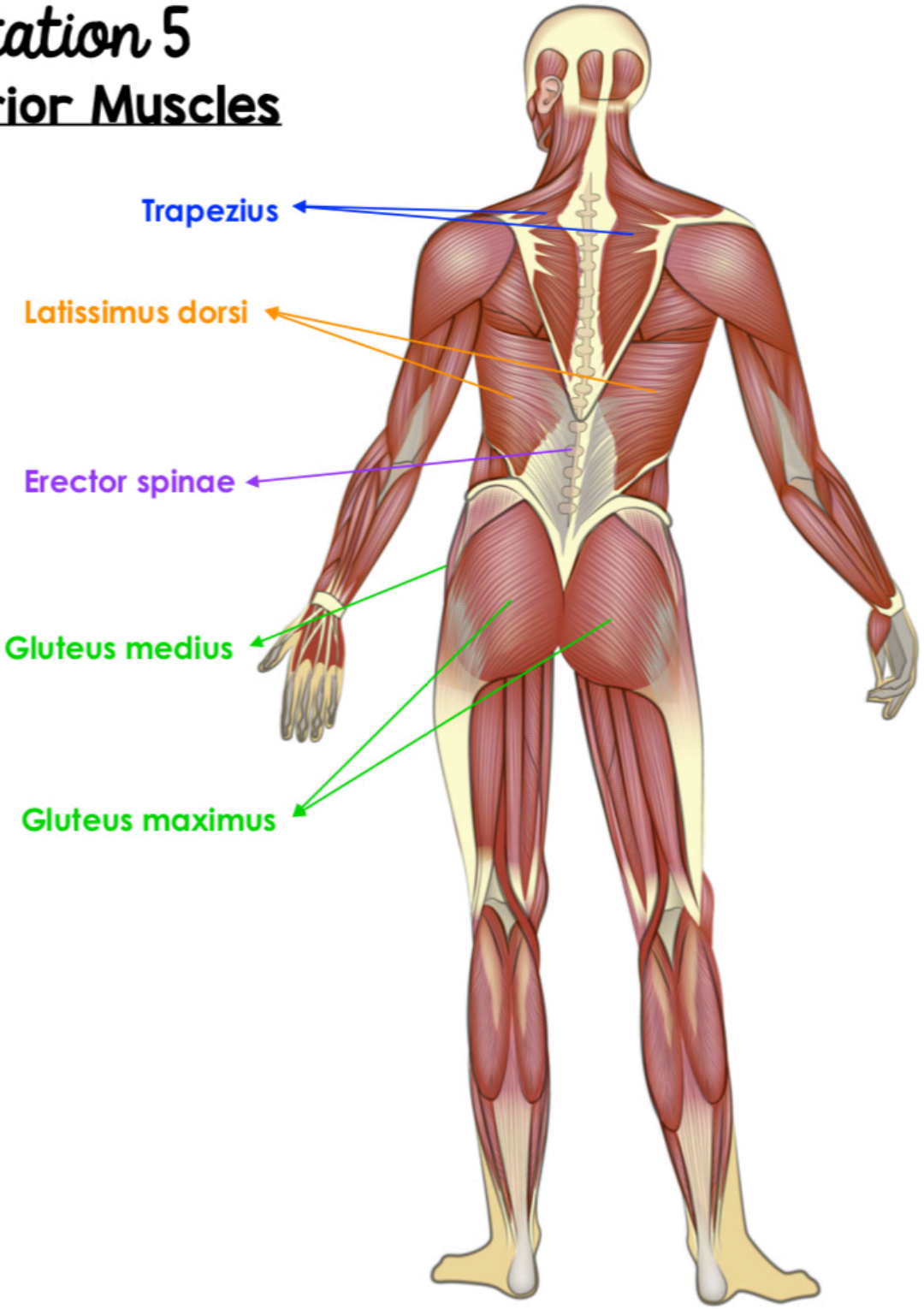
Posterior Muscles

The **trapezius** is the large triangular muscle in the upper back that is responsible for moving, rotating, and stabilizing the scapula, as well as extending the head at the neck.

The **latissimus dorsi** is the large triangular muscle of the lower back that is mainly responsible for arm movements. You couldn't swim, row, rock climb, or do chin-ups without your lats!

The **erector spinae** are a group of muscles that essentially run the length of the spinal column on both the right and left sides, from the base of your skull all the way to your sacrum. They keep the back straight and provide side-to-side rotation. They are the prime movers in back extension. When these muscles get injured, painful spasms can occur.

One of the largest and strongest skeletal muscles in the human body is the **gluteus maximus** in your bum. All 3 of the gluteal muscles *(maximus, medius, and minimus)* play a major role in movement of the hips and thighs and thus are critical for overall strength as well as good posture.

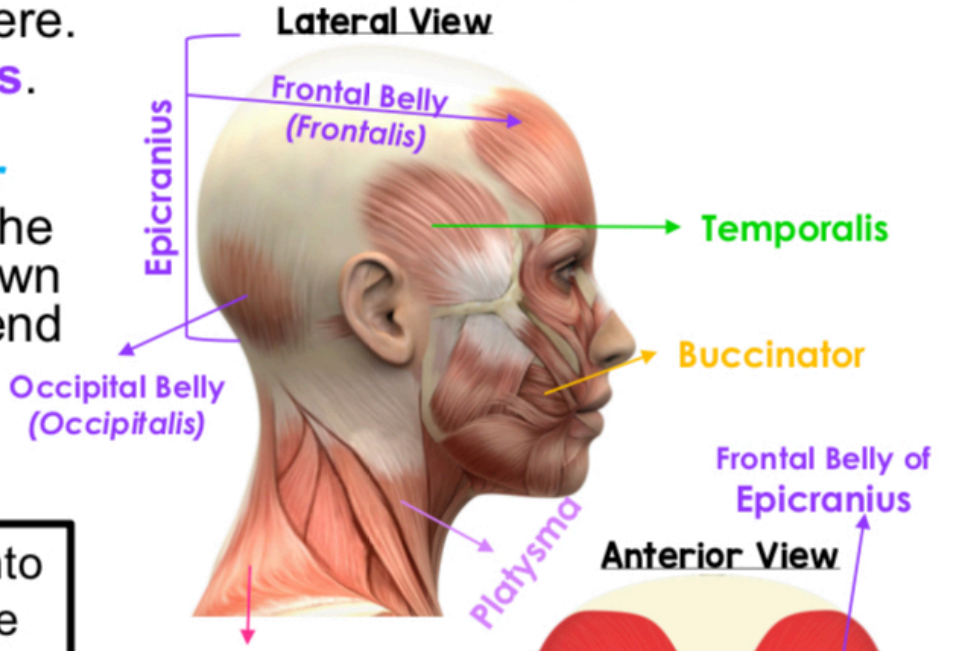


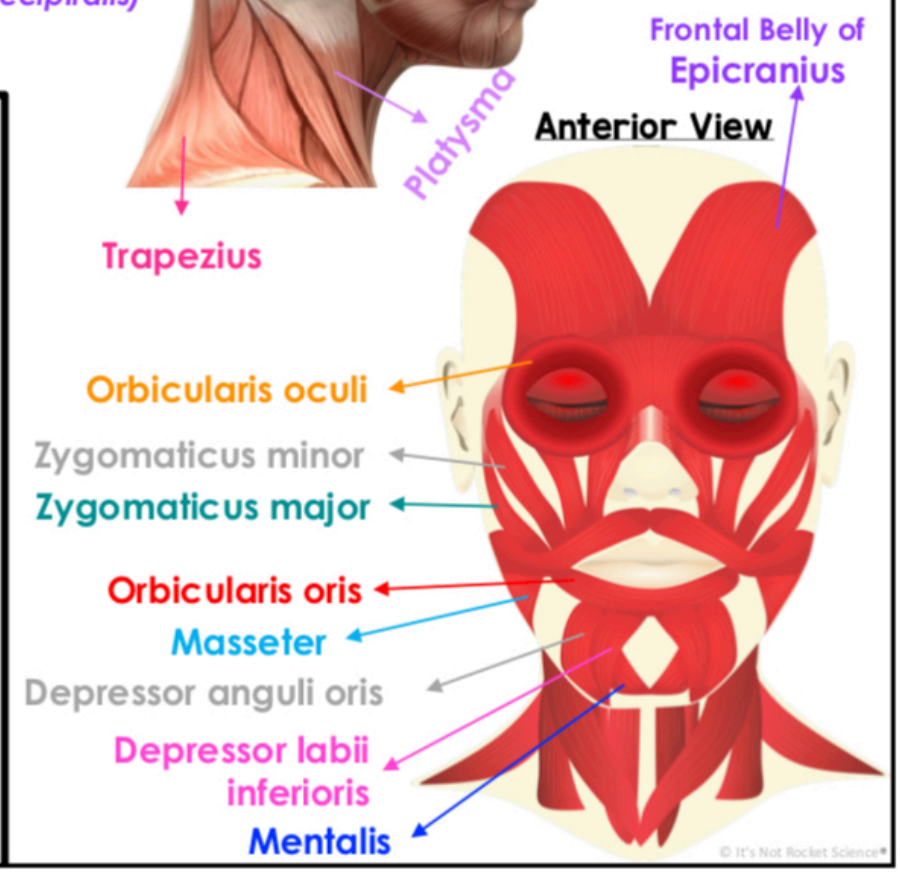
Station 6

Muscles of the Head and Neck

The muscles of the face are thin and lie just beneath the skin. They are unique compared to other muscles in that they insert into skin or other muscles, rather than bones. We will only highlight a few muscles here.

The main muscle of the scalp is the **epicranius**. The prime movers that allow your jaw to close (so you can chew your food) are the **masseter** and **temporalis** muscles. The **buccinator** is the main muscle of the cheek. The **trapezius** shown is one of two large triangular muscles that extend over the back of the neck and shoulders, and control movement of the head and shoulder blades.





Emoji Exercise: Use the mirror provided. Look into it and mimic the following emoji expressions to see some of your facial muscles at work!

*The **frontal belly** (forehead portion) of your **epicranius** allows you to raise your eyebrows and wrinkle your forehead.*

*The **mentalis** and **depressor labii inferioris** allow you to pout.*

*The **zygomaticus major** makes you smile.*

*The **orbicularis oris** allows you to pucker.*

*The **orbicularis oculi** allows you to blink.*

*The **platysma** allows your mouth to sag downwards and your neck to tense.*

*The **corrugator supercilii** allows you to furrow your eyebrows. (It isn't pictured but it is just where your eyebrows would be near the orbicularis oculi.)*