

SI A&P - Full Discipline Demo - Biodigital

Gross Anatomy of the Muscular System - BioDigital

Final Report - Answer Guide

Institution	Science Interactive University
Session	SI A&P - Full Discipline Demo - Biodigital
Course	SI A&P - Full Discipline Demo - Biodigital
Instructor	Sales SI Demo

Test Your Knowledge

Match each term with the best definition.

Terms to match:

- Agonist
- Fixator
- Insertion
- Origin
- Synergist

Definitions to match with:

- 1 The most proximal attachment of a muscle
- 2 One of the major muscles that performs a movement
- 3 A muscle that assists with movement
- 4 The attachment of the muscle at the distal end (considered the movable end)
- 5 A muscle that acts to stabilize the origin and other parts of the body for efficient limb movements

Correct answers:

1 Origin 2 Agonist 3 Synergist 4 Insertion 5 Fixator

Classify each statement as true or false.

True	False
1	2

Correct answers:

1 The gluteus maximus is named for its size.

The levator scapulae is named for the action it performs.

The masseter closes the mouth.

2 The external obliques are named for the number of origins they have.

The zygomaticus major and minor elevate the scapula.

Exploration

The origin of a muscle is a primarily stationary connection point associated with the stabilizing bone.

- ☒ True
- ☐ False



_____ are muscles that stabilize the origin and joints to help the body maintain a posture during a movement.

- ☐ Prime movers
- ☒ Fixators ✓
- ☐ Antagonists
- ☐ Synergists

The _____ is an example of a muscle that is named for its action.

- ☐ biceps brachii
- ☐ orbicularis oris
- ☒ levator scapulae ✓
- ☐ gluteus maximus

The _____ rotates the head.

- ☐ frontalis
- ☒ sternocleidomastoid ✓
- ☐ supraspinatus
- ☐ anconeus

Exercise 1

Which of the muscles activated and observed on your body from Data Table 1 would you consider agonists, and which would you consider fixators? Include the definitions of agonist and fixator in your explanation.

The frontalis, orbicularis oculi, orbicularis oris, zygomaticus major and minor, masseter, levator scapulae, and the sternocleidomastoid are considered agonists because each is one of the major muscles that performs a movement. The trapezius is considered a fixator because it is a muscle that acts to stabilize the arm.

Which of the muscles listed in Data Table 1 are named after the shape of the muscle? Include a description of the muscle shape in your explanation.

The orbicularis oris and orbicularis oculi are named after the shape of the muscle. The orbicularis oris forms a circular shape around the mouth, and the orbicularis oculi forms a circular shape around the eye.

Data Table 1: Action(s) of Head and Neck Muscles
(SAMPLE ANSWER BELOW)

Muscle	Action(s) Performed
Frontalis	Raises the eyebrows
Levator scapulae	Elevates shoulders
Masseter	Clenches jaw
Orbicularis oris	Puckers lips
Orbicularis oculi	Closes the eyelids
Sternocleidomastoid	Turns the head
Trapezius	Elevates shoulders, upward rotation of scapula
Zygomaticus	Pulls lips upward into smile

Photo 1: Head and Neck Muscles Virtual Model
(SAMPLE ANSWER BELOW)

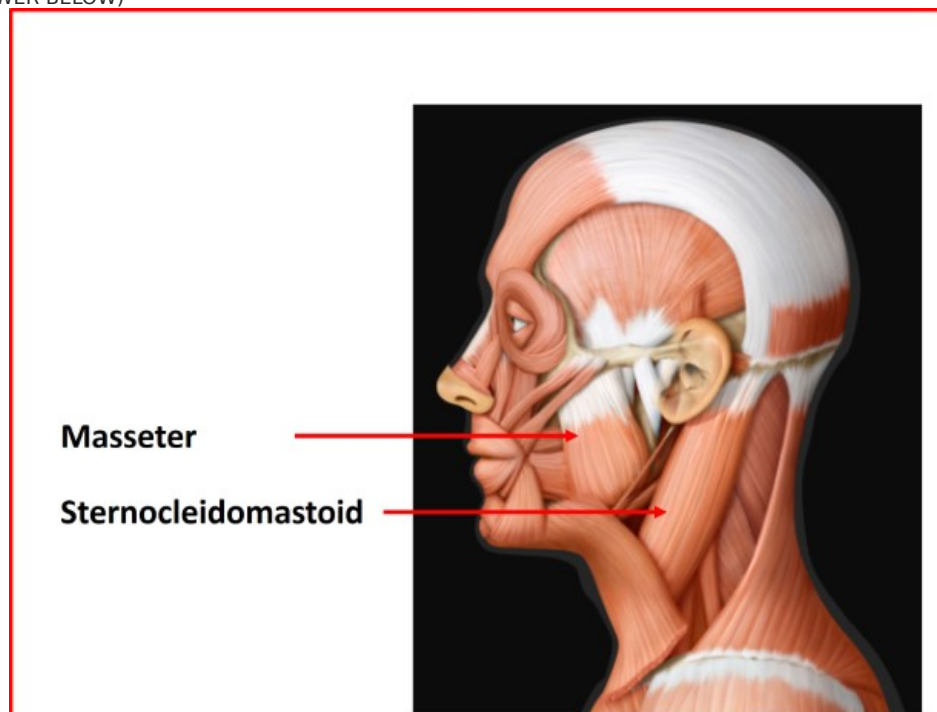
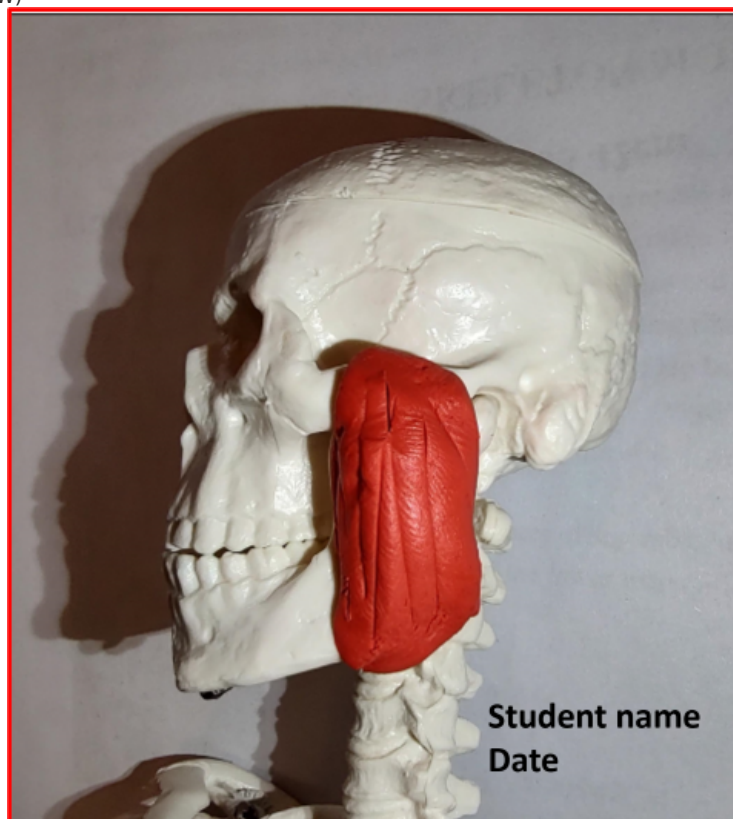


Photo 2: Masseter Physical Model
(SAMPLE ANSWER BELOW)

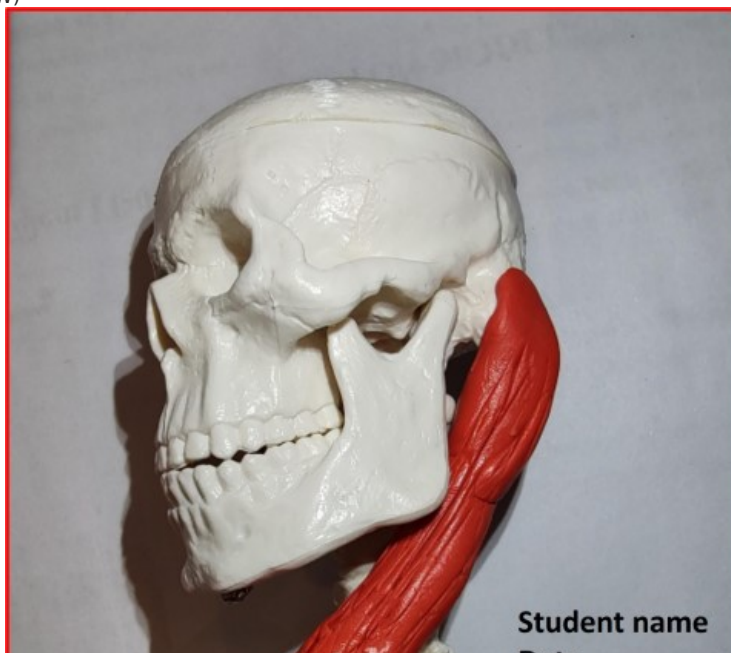




Data Table 2: Origin and Insertion for Head and Neck Muscle Models
(SAMPLE ANSWER BELOW)

Muscle	Origin	Insertion
Masseter	Zygomatic arch	Mandible
Sternocleidomastoid	Anterior superior manubrium and superior clavicle	Lateral mastoid process and anterior superior nuchal line

Photo 3: Sternocleidomastoid Physical Model
(SAMPLE ANSWER BELOW)





Exercise 2

Which of the muscles activated and observed on your body from Data Table 3 would you consider synergists? Include the definition of synergist in your explanation.

Synergists are muscles that assist agonists. The pectoralis minor is considered a synergist to the pectoralis major. The teres minor is considered a synergist to the teres major, and the rhomboid minor is considered a synergist to the rhomboid major.

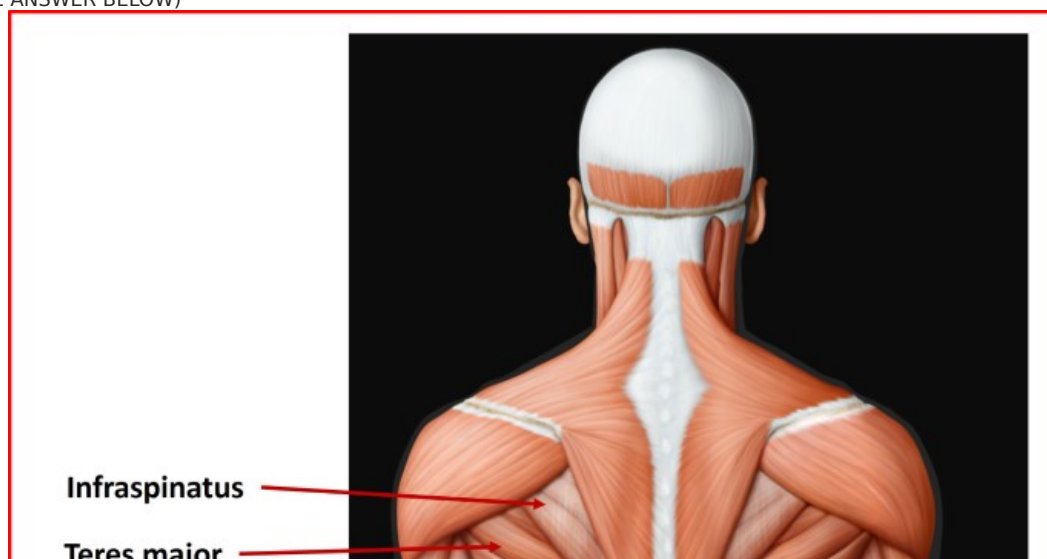
Which of the muscles activated and observed on your body from Data Table 3 would you consider fixators? Include the definition of fixator in your explanation.

Fixators are muscles that stabilize the origin and joints to help the body maintain a posture during a movement. The latissimus dorsi of the back and the rectus abdominis of the abdomen stabilize and torso during running.

Data Table 3: Action(s) Performed by Muscles of the Torso
(SAMPLE ANSWER BELOW)

Muscle	Action(s) Performed
Deltoid	Abduction of the arm
External oblique	Flexion and rotation of the trunk
Infraspinatus	Stabilizes the shoulder, externally rotates the arm
Latissimus dorsi	Shoulder extension, adduction, transverse extension
Pectoralis major and pectoralis minor	Flexion of the humerus, adduction of the humerus, rotates the humerus internally, aids in inspiration, keeps the arm attached to the trunk; depresses the shoulder
Rectus abdominis (under fascia)	Flexion of the trunk
Rhomboid major	Holds the scapula on the rib cage, retracts the scapula, stabilizes the scapula, rotates the scapula
Rhomboid minor	Holds the scapula on the rib cage, retracts the scapula, stabilizes the scapula, rotates the scapula
Serratus anterior	Assists in respiration, stabilizes and protracts the scapula
Subscapularis	Internal rotation of humerus, holds the humerus in place
Supraspinatus	Abduction of the arm, stabilizes the shoulder joint
Teres major	Internal rotation of the humerus, adduction of the humerus, stabilization of the humerus
Teres minor	External rotates humerus, transverse adduction and extension

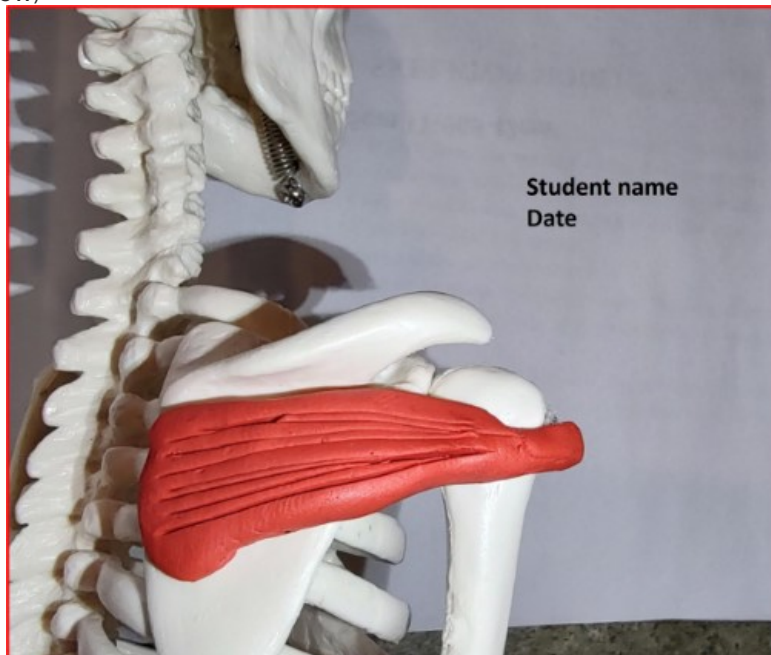
Photo 4: Torso Muscles Virtual Model
(SAMPLE ANSWER BELOW)



erect major



Photo 5: Infrapinatus Physical Model
(SAMPLE ANSWER BELOW)

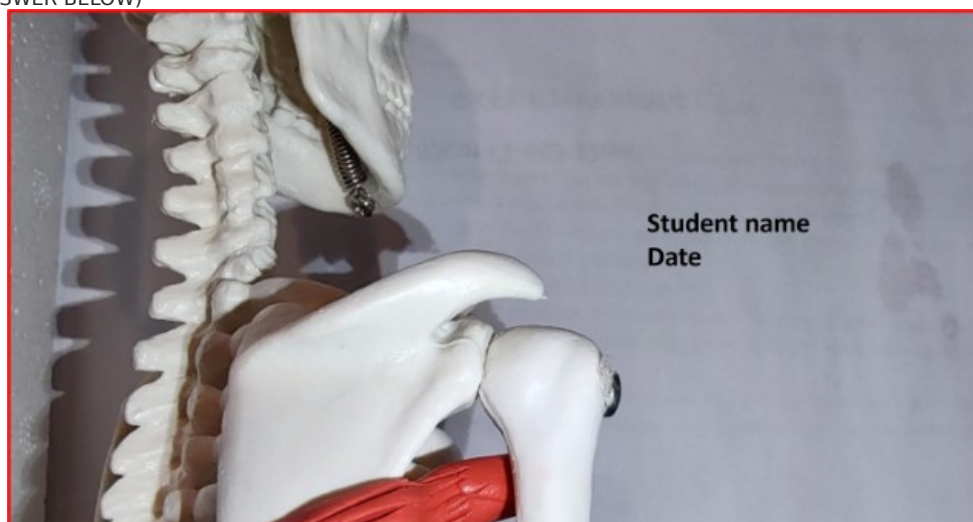




Data Table 4: Origin and Insertion for Torso Muscle Models
(SAMPLE ANSWER BELOW)

Muscle	Origin	Insertion
Infraspinatus	Infraspinous fossa of the scapula	Middle part of the greater tubercle of the humerus
Teres major	Lateral border of the scapula	Medial lip of the humerus

Photo 6: Teres Major Physical Model
(SAMPLE ANSWER BELOW)





Exercise 3

Which of the muscles activated and observed on your body from Data Table 5 would you consider antagonists? Include the definition of antagonist in your explanation.

An antagonist is a muscle that opposes the action of an agonist. The triceps brachii, anconeus, extensor carpi radialis brevis, extensor carpi ulnaris, and extensor digitorum superficialis would be considered antagonists because they extend the lower arm, hand, and fingers, respectively.

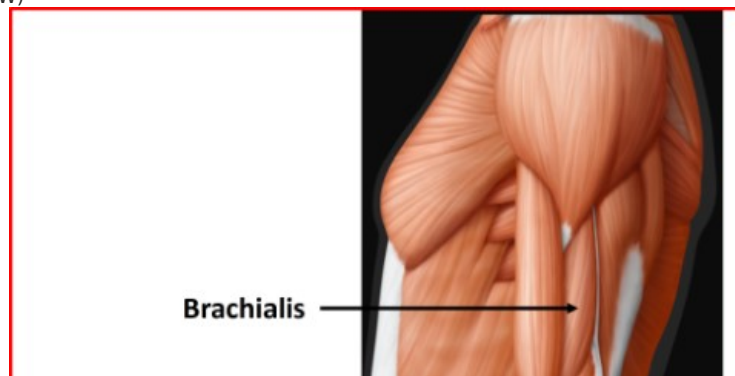
Which of the muscles in Data Table 5 are named for the number of origins? Explain how many origins each muscle has in your explanation.

The biceps brachii and triceps brachii are named for the number of origins of each muscle. The biceps brachii has two origins while the triceps brachii has three origins.

Data Table 5: Action(s) Performed by Muscles of the Arm
(SAMPLE ANSWER BELOW)

Muscle	Action(s) Performed
Anconeus	Assists in extension of elbow, controls ulnar abduction during forearm pronation
Biceps brachii	Flexion of the elbow, supination of the forearm
Brachialis	Flexion of the elbow
Brachioradialis	Flexion of the elbow
Coracobrachialis	Assists in shoulder flexion and shoulder adduction
Extensor carpi radialis longus	Extension/abduction of the hand/wrist
Extensor carpi radialis brevis	Extension/abduction of the hand/wrist
Extensor digitorum communis	Extension of the hand/wrist/phalanges/elbow
Flexor carpi radialis	Flexion and abduction of the hand
Flexor carpi ulnaris	Flexion and adduction of the hand
Palmaris longus	Flexion of the wrist
Pronator teres	Pronation of the forearm, elbow flexion
Triceps brachii	Extension of the elbow

Photo 7: Virtual Model Muscles of the Arms
(SAMPLE ANSWER BELOW)



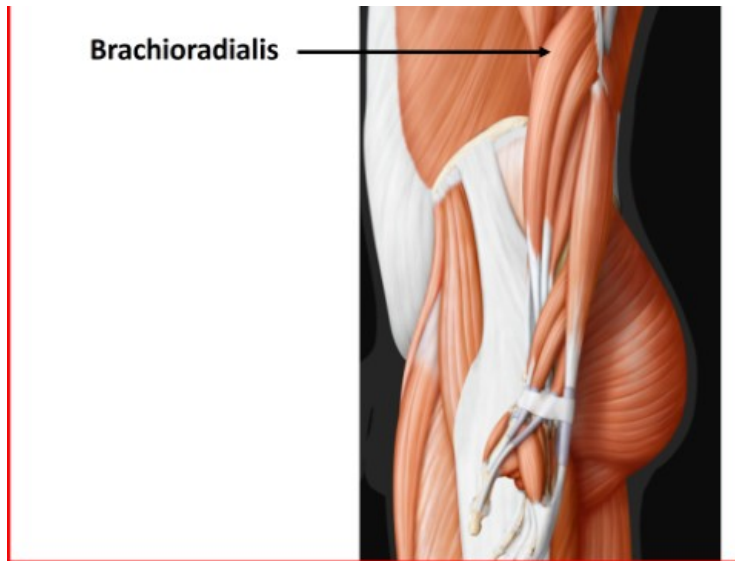
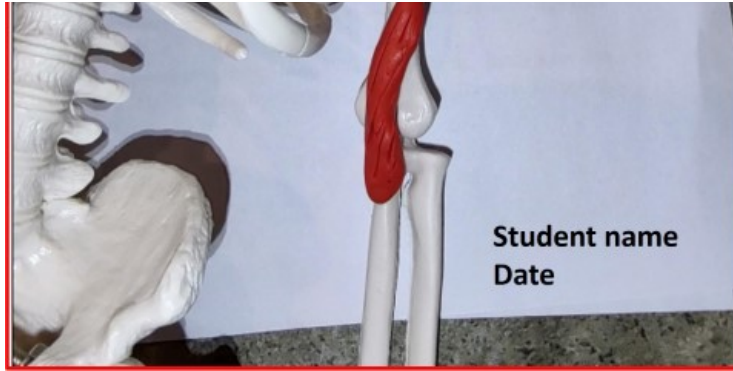


Photo 8: Brachialis Muscle of Physical Model
(SAMPLE ANSWER BELOW)



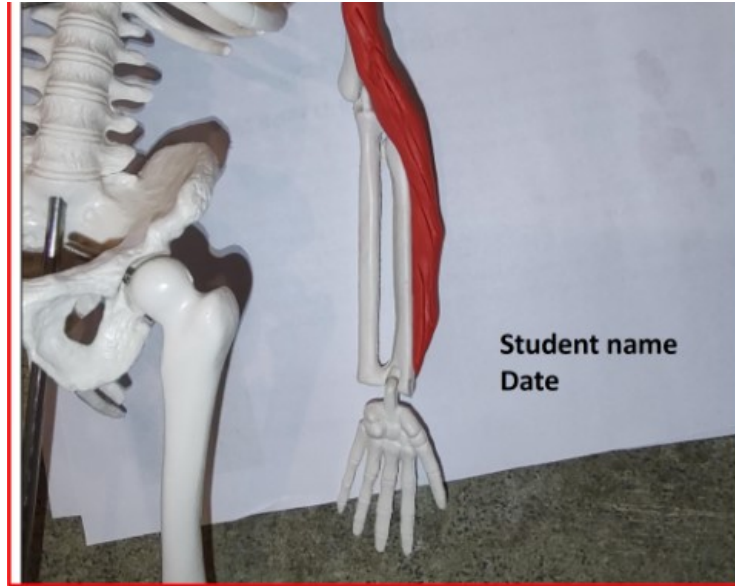


Data Table 6: Origin and Insertion for the Arm Muscle Models
(SAMPLE ANSWER BELOW)

Muscle	Origin	Insertion
Brachialis	Distal anterior humerus	Ulnar tuberosity
Brachioradialis	Lateral supracondylar ridge of the humerus	Lateral surface of the styloid process of the radius

Photo 9: Brachioradialis Muscle of Physical Model
(SAMPLE ANSWER BELOW)





Exercise 4

Which of the muscles of the leg are named after their location. Describe the muscle's location in your explanation.

Why is it important to have both flexors and extensors?

Utilization of both flexors and extensors is necessary to coordinate movement in more than one direction.

Photo 10: Medial Muscles of the Upper Extremities
(SAMPLE ANSWER BELOW)

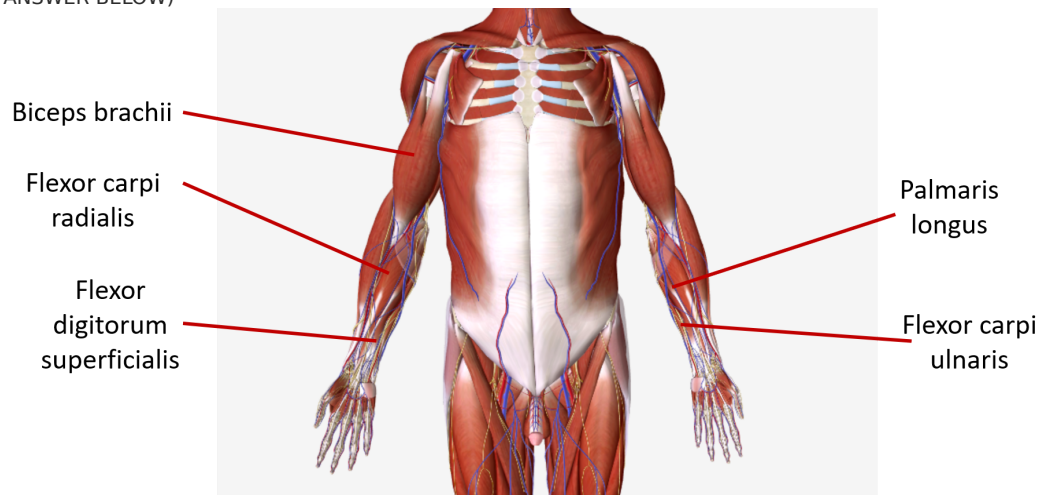


Photo 11: Upper Back and Shoulder
(SAMPLE ANSWER BELOW)

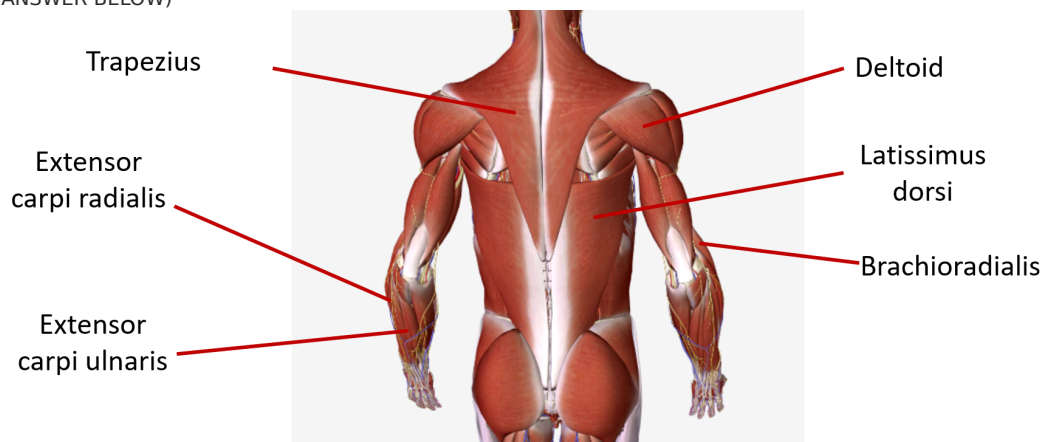


Photo 12: Abdominal and Intercostal Muscles
(SAMPLE ANSWER BELOW)

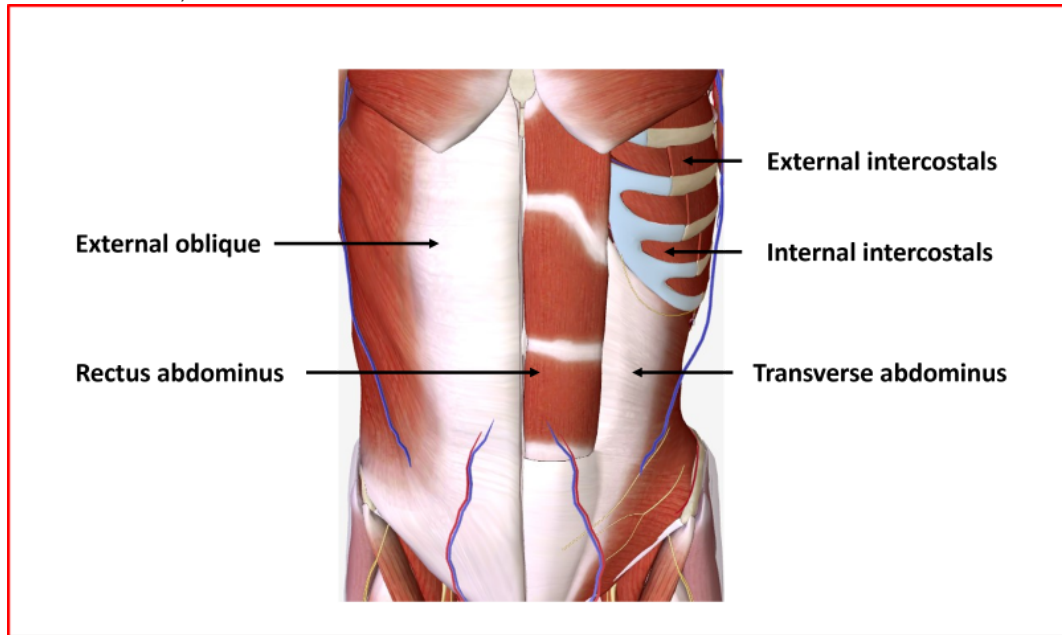


Photo 13: Superficial Muscles of the Lower Limb
(SAMPLE ANSWER BELOW)

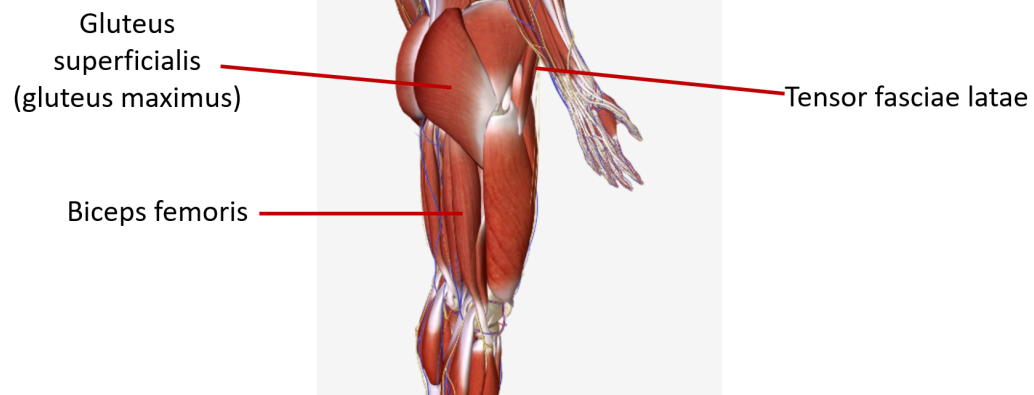


Photo 14: Additional Muscles of the Lateral Lower Extremity
(SAMPLE ANSWER BELOW)

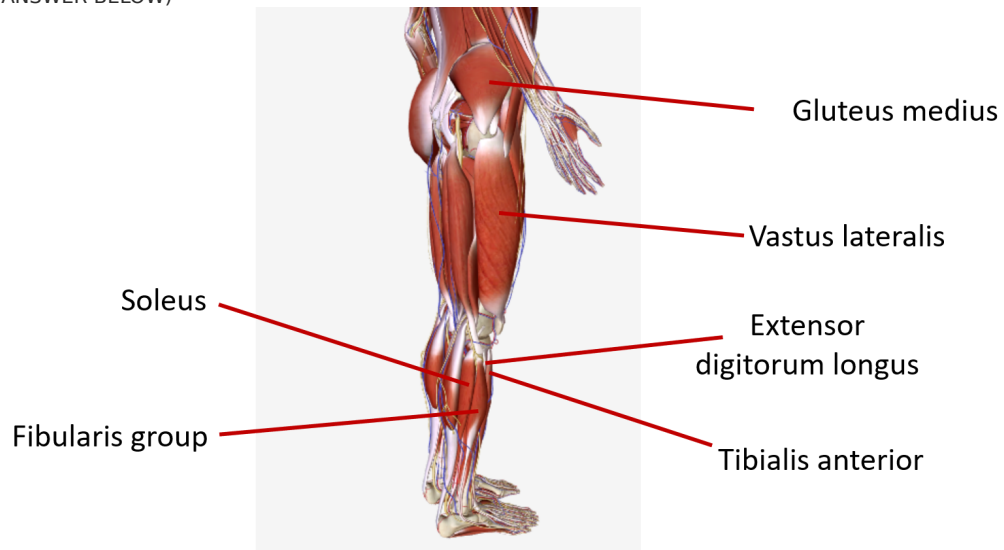


Photo 15: Superficial Muscles of the Medial Thigh
(SAMPLE ANSWER BELOW)



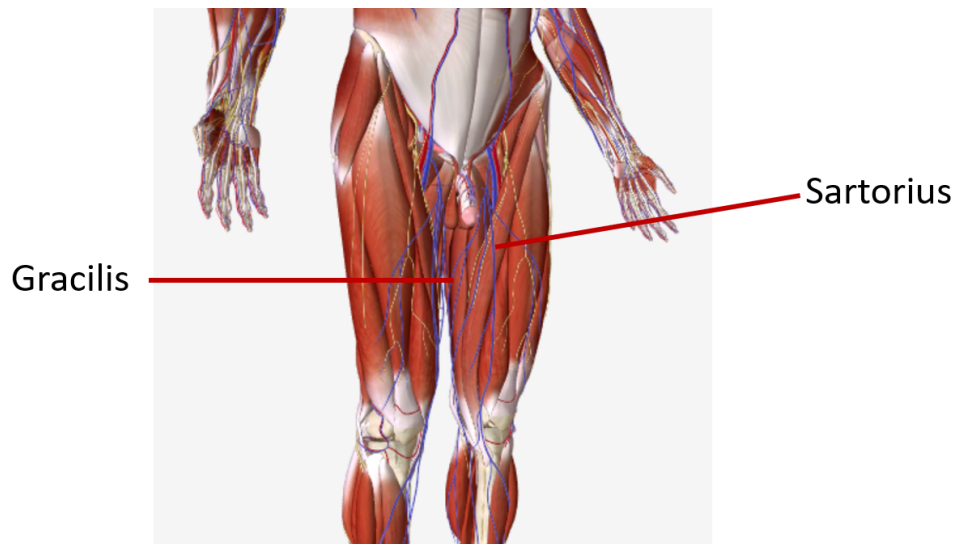
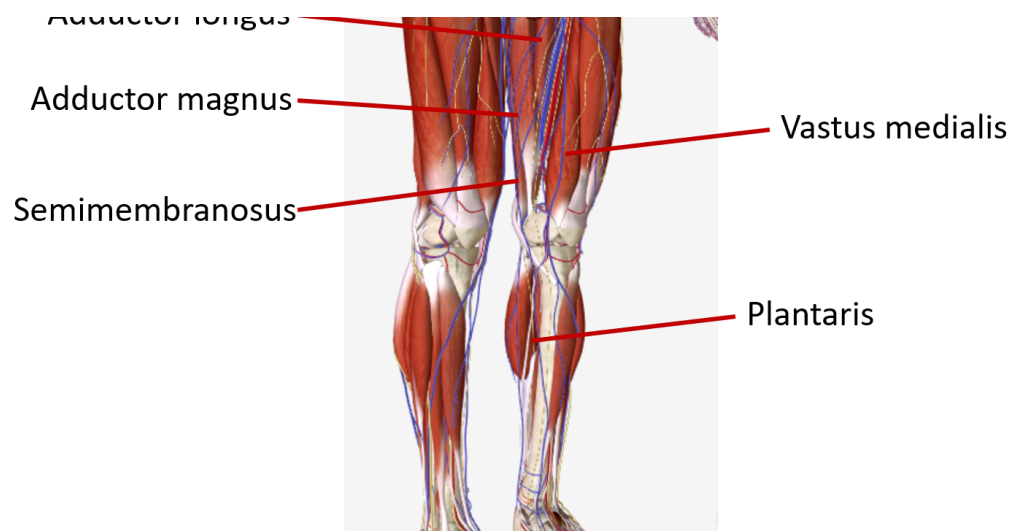


Photo 16: Muscles of the Medial Lower Extremity
(SAMPLE ANSWER BELOW)





Competency Review

The ____ is the attachment of the distal end of the muscle to the moving bone.

- ☒ insertion ✓
 - ☐ origin
 - ☐ agonist
 - ☐ antagonist
-

____ are muscles that stabilize the origin and joints to help the body maintain a posture during a movement.

- ☐ Agonists
 - ☐ Antagonists
 - ☐ Synergists
 - ☒ Fixators ✓
-

Muscles are named based on ____.

- ☐ size
 - ☐ location
 - ☐ shape
 - ☒ All of the above ✓
-

The ____ is named for the number of origins of the muscle.

- ☐ gluteus maximus
 - ☐ tibialis anterior
 - ☒ biceps brachii ✓
 - ☐ orbicularis oris
-

The ____ acts to elevate the eyebrows.

- ☒ frontalis ✓
 - ☐ masseter
 - ☐ teres minor
 - ☐ rhomboid major
-

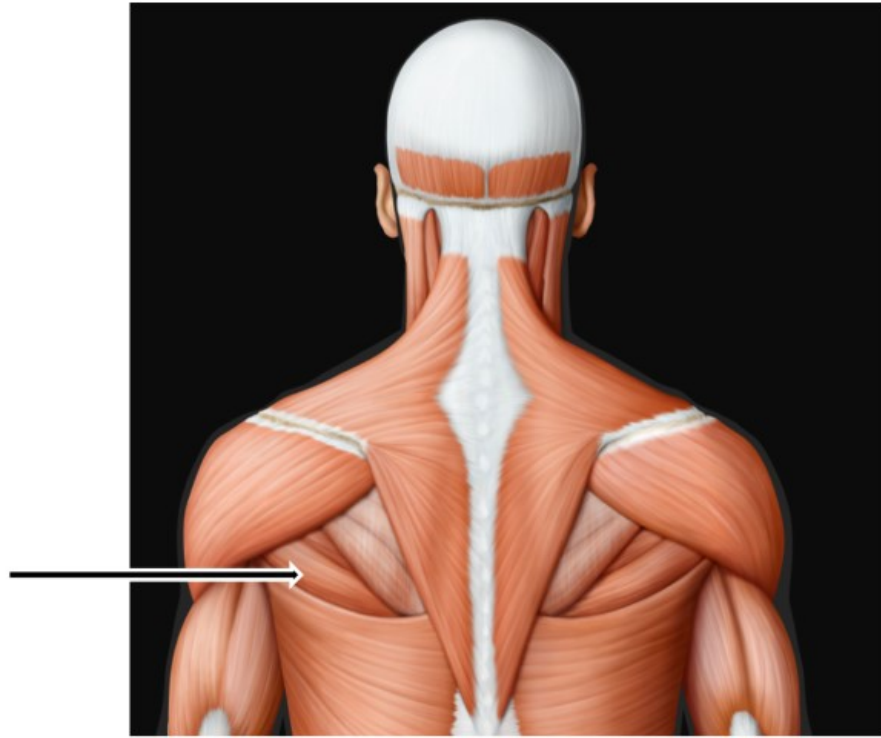
The palmaris longus acts to flex the wrist.

- ☒ True ✓
 - ☐ False
-

When standing in front of a mirror and activating the trapezius muscles, the ____ appear to elevate.

- ☐ ears
 - ☐ lips
 - ☒ shoulders ✓
 - ☐ knees
-

The ____ is indicated by the arrow in the image of the Virtual Model below.



- ☐ teres major
- ☐ deltoid
- ☐ rectus abdominus
- ☐ triceps brachii

✓

When constructing clay muscles of the arms on a skeleton model, a toothpick is used to create muscle fibers.

- ☐ True
- ☐ False

✓

Extension Questions

Many types of back pain can be relieved by consistently performing core strengthening exercises. What is the role of the muscles targeted by these exercises, and why does strengthening them help ease back pain? (SAMPLE ANSWER BELOW)

The core muscles include the muscles of the abdomen, side, and back. These muscles are primarily fixators and serve to stabilize the spine. By strengthening these muscles, they are better able to maintain proper position of the spine and can often reduce back pain as a result.

