

TLC Muscle Actions, Origins, and Insertions (AOIs) organized by Kinesiology Quiz

Muscle	Action	Origin	Insertion
6a Kinesiology Quiz			
Deltoid	<p>All Fibers Abduct the shoulder (glenohumeral joint)</p> <p>Anterior Fibers Flex the shoulder (G/H joint) Medially rotate the shoulder (G/H joint) Horizontally adduct the shoulder (G/H joint)</p> <p>Posterior Fibers Extend the shoulder (G/H joint) Laterally rotate the shoulder (G/H joint) Horizontally abduct the shoulder (G/H joint)</p>	Lateral one-third of clavicle Acromion Spine of scapula	Deltoid tuberosity
Trapezius	<p>Upper Fibers <i>Bilaterally</i> Extend the head and neck</p> <p><i>Unilaterally</i> Laterally flex the head and neck to the same side Rotate the head and neck to the opposite side Elevate the scapula (scapulothoracic joint) Upwardly rotate the scapula (S/T joint)</p> <p>Middle Fibers Adduct the scapula (S/T joint) Stabilize the scapula (S/T joint)</p> <p>Lower Fibers Depress the scapula (S/T joint) Upwardly rotate the scapula (S/T joint)</p>	External occipital protuberance Medial portion of superior nuchal line of the occiput Ligamentum nuchae Spinous processes of C-7 through T-12	Lateral one-third of clavicle Acromion Spine of scapula
Latissimus Dorsi	Extend the shoulder (glenohumeral joint) Adduct the shoulder (G/H joint) Medially rotate the shoulder (G/H joint)	Inferior angle of scapula Spinous processes of last six thoracic vertebrae Last three or four ribs Thoracolumbar fascia Posterior iliac crest	Intertubercular groove of the humerus
Teres Major	Extend the shoulder (glenohumeral joint) Adduct the shoulder (G/H joint) Medially rotate the shoulder (G/H joint)	Inferior angle and lower one-third of lateral border of the scapula	Crest of the lesser tubercle of the humerus

Muscle	Action	Origin	Insertion
Triceps Brachii	<p>All Heads Extend the elbow (humeroulnar joint)</p> <p>Long Head Extend the shoulder (glenohumeral joint) Adduct the shoulder (G/H joint)</p>	<p>Long Head Infraglenoid tubercle of the scapula</p> <p>Lateral Head Posterior surface of proximal half of the humerus</p> <p>Medial Head Posterior surface of distal half of the humerus</p>	Olecranon process of the ulna
Rhomboid Major and Minor	Adduct the scapula (scapulothoracic joint) Elevate the scapula (S/T joint) Downwardly rotate the scapula (S/T joint)	<p>Major Spinous processes of T-2 to T-5</p> <p>Minor Spinous processes of C-7 and T-1</p>	<p>Major Medial border of the scapula between the spine of the scapula and inferior angle</p> <p>Minor Upper portion of medial border of the scapula, across from spine of the scapula</p>
Erector Spinae Group <i>Spinalis Longissimus</i> <i>Iliocostalis</i>	<p>Unilaterally Laterally flex vertebral column to the same side</p> <p>Bilaterally Extend the vertebral column</p>	Common tendon (thoracolumbar fascia) that attaches to the posterior surface of sacrum Iliac crest Spinous processes of the lumbar Last two thoracic vertebrae	Various attachments at the posterior ribs Spinous and transverse processes of thoracic and cervical vertebrae Mastoid process of the temporal bone
Spinalis	See above	Spinous processes of the upper lumbar and lower thoracic vertebrae (thoracis) Ligamentum nuchae Spinous process of C-7 (cervicis)	Spinous processes of upper thoracic (thoracis) Spinous processes of cervicals, except C-1 (cervicis)
Iliocostalis	See above	Common tendon (lumborum) Posterior surface of ribs 1-12 (thoracis and cervicis)	Transverse processes of lumbar vertebrae 1-3 Posterior surface of ribs 6-12 (lumborum) Posterior surface of ribs 1-6 (thoracis) Transverse processes of lower cervicals (cervicis)
Longissimus	See above	Common tendon (thoracis) Transverse processes of upper five thoracic vertebrae (cervicis and capitis)	Lower nine ribs and transverse processes of thoracic vertebrae (thoracis) Transverse processes of cervical vertebrae (cervicis) Mastoid process of temporal bone (capitis)

Muscle	Action	Origin	Insertion
9a Kinesiology Quiz			
Gluteus Maximus	<p>All Fibers Extend the hip (coxal joint) Laterally rotate the hip (coxal joint) Abduct the hip (coxal joint)</p> <p>Lower Fibers Adduct the hip (coxal joint)</p>	Coccyx Edge of sacrum Posterior iliac crest Sacrotuberous and sacroiliac ligaments	Iliotibial tract (upper fibers) Gluteal tuberosity (lower fibers)
Gluteus Medius	<p>All Fibers Abduct the hip (coxal joint)</p> <p>Anterior Fibers Flex the hip (coxal joint) Medially rotate the hip (coxal joint)</p> <p>Posterior Fibers Extend the hip (coxal joint) Laterally rotate the hip (coxal joint)</p>	Gluteal surface of ilium between posterior and anterior gluteal lines, just below the iliac crest	Lateral aspect of greater trochanter
Gluteus Minimus	Abduct the hip (coxal joint) Medially rotate the hip (coxal joint) Flex the hip (coxal joint)	Gluteal surface of the ilium between the anterior and inferior gluteal lines	Anterior aspect of greater trochanter
Biceps Femoris	Flex the knee (tibiofemoral joint) Laterally rotate the flexed knee (T/F joint) Tilt the pelvis posteriorly <p>Long Head Extend the hip (coxal joint) Assist to laterally rotate the hip (coxal joint)</p>	<p>Long Head Ischial tuberosity</p> <p>Short Head Lateral lip of linea aspera</p>	Head of the fibula

Muscle	Action	Origin	Insertion
Semimembranosus	Flex the knee (tibiofemoral joint) Medially rotate the flexed knee (T/F joint) Extend the hip (coxal joint) Assist to medially rotate the hip (coxal joint) Tilt the pelvis posteriorly	Ischial tuberosity	Posterior aspect of medial condyle of tibia
Semitendinosus	Flex the knee (tibiofemoral joint) Medially rotate the flexed knee (T/F joint) Extend the hip (coxal joint) Assist to medially rotate the hip (coxal joint) Tilt the pelvis posteriorly	Ischial tuberosity	Proximal, medial shaft of the tibia at pes anserinus tendon
Gastrocnemius	Flex the knee (tibiofemoral joint) Plantar flex the ankle (talocrural joint)	Condyles of the femur, posterior surfaces	Calcaneus via calcaneal tendon
Soleus	Plantar flex the ankle (talocrural joint)	Soleal line Proximal, posterior surface of tibia Posterior aspect of head of fibula	Calcaneus via calcaneal tendon

Muscle	Action	Origin	Insertion
14a Kinesiology Quiz			
Tibialis Anterior	Invert the foot Dorsiflex the ankle (talocrural joint)	Lateral condyle of tibia Proximal, lateral surface of tibia Interosseous membrane	Medial cuneiform Base of the first metatarsal
Fibularis/Peroneus Brevis	Evert the foot Assist to plantar flex the ankle (talocrural joint)	Distal two-thirds of lateral fibula	Tuberosity of fifth metatarsal
Fibularis/Peroneus Longus	Evert the foot Assist to plantar flex the ankle (talocrural joint)	Head of fibula Proximal two-thirds of lateral fibula	Base of the first metatarsal Medial cuneiform
Quadriceps Femoris Group <i>Rectus Femoris Vastus Medialis Vastus Lateralis Vastus Intermedius</i>	All Extend the knee (tibiofemoral joint) Rectus Femoris Flex the hip (coxal joint)	Rectus Femoris Anterior inferior iliac spine (AIIS) Vastus Medialis Medial lip of linea aspera Vastus Lateralis Lateral lip of linea aspera Gluteal tuberosity Greater trochanter Vastus Intermedius Anterior and lateral shaft of the femur	Tibial tuberosity (via the patella and patellar ligament)
Rectus Abdominis	Flex the vertebral column Tilt pelvis posteriorly	Pubic crest Pubic symphysis	Cartilage of fifth, sixth and seventh ribs Xiphoid process
Pectoralis Major	All Fibers Adduct the shoulder (glenohumeral joint) Medially rotate the shoulder (G/H joint) Assist to elevate the thorax during forced inhalation (with the arm fixed) Upper Fibers Flex the shoulder (G/H joint) Horizontally adduct the shoulder (G/H joint) Lower Fibers Extend the shoulder (G/H joint)	Medial half of clavicle, sternum and cartilage of first through sixth ribs	Crest of greater tubercle of humerus

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18a Kinesiology Quiz			
Biceps Brachii	Flex the elbow (humeroulnar joint) Supinate the forearm (radioulnar joints) Flex the shoulder (glenohumeral joint)	Short Head Coracoid process of scapula Long Head Supraglenoid tubercle of scapula	Tuberosity of the radius Aponeurosis of the biceps brachii
Coracobrachialis	Flex the shoulder (glenohumeral joint) Adduct the shoulder (G/H joint)	Coracoid process of the scapula	Medial surface of mid-humeral shaft
Sternocleidomastoid	Unilaterally Laterally flex the head and neck to the same side Rotate the head and neck to the opposite side Bilaterally Flex the neck Assist to elevate the rib cage during inhalation	Sternal Head Top of manubrium Clavicular Head Medial one-third of the clavicle	Mastoid process of temporal bone The lateral portion of superior nuchal line of occiput
Levator Scapula	Unilaterally Elevate the scapula (scapulothoracic joint) Downwardly rotate the scapula (S/T joint) Laterally flex the head and neck Rotate the head and neck to the same side Bilaterally Extend the head and neck	Transverse processes of first through fourth cervical vertebrae	Medial border of scapula, between superior angle and superior portion of spine of scapula
Anterior Scalene	Unilaterally With the ribs fixed, laterally flex the head and neck to the same side Rotate head and neck to the opposite side Bilaterally Elevate the ribs during inhalation Flex the head and neck	Transverse processes of third through sixth cervical vertebrae (anterior tubercles)	First rib

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Middle Scalene	<p>Unilaterally With the ribs fixed, laterally flex the head and neck to the same side Rotate head and neck to the opposite side</p> <p>Bilaterally Elevate the ribs during inhalation</p>	Transverse processes of second through seventh cervical vertebrae (posterior tubercles)	First rib
Posterior Scalene	<p>Unilaterally With the ribs fixed, laterally flex the head and neck to the same side Rotate head and neck to the opposite side</p> <p>Bilaterally Elevate the ribs during inhalation</p>	Transverse processes of sixth and seventh cervical vertebrae (posterior tubercles)	Second rib
Masseter	Elevate the mandible (temporomandibular joint) May assist to protract the mandible (TM joint)	Zygomatic arch	Angle and ramus of mandible
Temporalis	Elevate the mandible (temporomandibular joint) Retract the mandible (TM joint)	Temporal fossa and fascia	Coronoid process Anterior edge of ramus of the mandible
Occipitofrontalis	<p>Frontalis Raise the eyebrows and wrinkle the forehead</p> <p>Occipitalis Anchor and retract the galea posteriorly</p>	Both: Galea aponeurotica	<p>Frontalis Skin superior to eyebrows</p> <p>Occipitalis Superior nuchal line of the occiput</p>

Muscle	Action	Origin	Insertion
30a Kinesiology Quiz			
Supraspinatus	Abduct the shoulder (glenohumeral joint) Stabilize the head of humerus in glenoid cavity	Supraspinous fossa of the scapula	Greater tubercle of the humerus
Infraspinatus	Laterally rotate the shoulder (G/H joint) Adduct the shoulder (G/H joint) Stabilize the head of humerus in glenoid cavity	Infraspinous fossa of the scapula	Greater tubercle of the humerus
Teres Minor	Laterally rotate the shoulder (G/H joint) Adduct the shoulder (G/H joint) Stabilize the head of humerus in glenoid cavity	Upper two-thirds of lateral border of the scapula	Greater tubercle of the humerus
Subscapularis	Medially rotate the shoulder (G/H joint) Stabilize the head of humerus in glenoid cavity	Subscapular fossa of the scapula	Lesser tubercle of the humerus
Pectoralis Minor	Depress the scapula (scapulothoracic joint) Abduct the scapula (S/T joint) Downwardly rotate the scapula (S/T joint) With Scapula Fixed Assist to elevate the thorax during forced inhalation	Third, fourth and fifth ribs	Medial surface of coracoid process of the scapula
Serratus Anterior	With the Origin Fixed Abduct the scapula (scapulothoracic joint) Upwardly rotate the scapula (S/T joint) Depress the scapula (S/T joint) Hold the medial border of the scapula against the rib cage With the Scapula Fixed May act to elevate the thorax during forced inhalation	External surfaces of upper eight or nine ribs	Anterior surface of medial border of the scapula

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43a Kinesiology Quiz			
Adductor Magnus	Adduct the hip (coxal joint) Medially rotate the hip (coxal joint) Assist to flex the hip (coxal joint) Posterior Fibers Extend the hip (coxal joint)	Inferior ramus of the pubis Ramus of ischium Ischial tuberosity	Medial lip of linea aspera Adductor tubercle
Gracilis	Adduct the hip (coxal joint) Medially rotate the hip (coxal joint) Flex the knee (tibiofemoral joint) Medially rotate the flexed knee (T/F joint)	Inferior ramus of pubis	Proximal, medial shaft of the tibia at pes anserinus tendon
Iliacus	With the Origin Fixed Flex the hip (coxal joint) May laterally rotate the hip (coxal joint) With the Insertion Fixed Flex the trunk toward the thigh Tilt pelvis anteriorly	Iliac fossa	Lesser trochanter
Psoas Major	With the Origin Fixed Flex the hip (coxal joint) May laterally rotate the hip (coxal joint) With the Insertion Fixed Flex the trunk toward the thigh Tilt pelvis anteriorly Unilaterally Assist to laterally flex the lumbar spine	Bodies and transverse processes of lumbar vertebrae	Lesser trochanter
Sartorius	Flex the hip (coxal joint) Laterally rotate the hip (coxal joint) Abduct the hip (coxal joint) Flex the knee (tibiofemoral joint) Medially rotate the flexed knee (T/F joint)	Anterior superior iliac spine (ASIS)	Proximal, medial shaft of the tibia at pes anserinus tendon
Tensor Fasciae Latae and Iliotibial Tract	Flex the hip (coxal joint) Medially rotate the hip (coxal joint) Abduct the hip (coxal joint)	Iliac crest, posterior to the ASIS	Iliotibial tract
Piriformis	Laterally rotate the hip (coxal joint) Abduct the hip when the hip is flexed	Anterior surface of sacrum	Superior aspect of greater trochanter
Quadratus Femoris	Laterally rotate the hip (coxal joint)	Lateral border of ischial tuberosity	Intertrochanteric crest, between the greater and lesser trochanters

Muscle	Action	Origin	Insertion
52a Kinesiology Quiz			
Brachialis	Flex the elbow (humeroulnar joint)	Distal half of anterior surface of humerus	Tuberosity and coronoid process of ulna
Brachioradialis	Flex the elbow (humeroulnar joint) Assist to pronate and supinate the forearm when these movements are resisted	Proximal two-thirds of the lateral supracondylar ridge of humerus	Styloid process of radius
Flexor Digitorum Superficialis	Flex the second through fifth fingers (metacarpophalangeal and proximal interphalangeal joints) Flex the wrist (radiocarpal joint)	Common flexor tendon from medial epicondyle of humerus Ulnar collateral ligament Coronoid process of ulna Interosseous membrane Proximal shaft of radius	Sides of middle phalanges of second through fifth fingers
Extensor Digitorum	Extend the second through fifth fingers (metacarpophalangeal and interphalangeal joints) Assist to extend the wrist (radiocarpal joint)	Common extensor tendon from the lateral epicondyle of humerus	Bases of middle and distal phalanges of second through fifth fingers

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Other Muscles Learned:			
Quadratus Lumborum (53a)	<p>Unilaterally Laterally tilt (elevate) the pelvis Laterally flex the vertebral column to the same side Assist to extend the vertebral column</p> <p>Bilaterally Fix the last rib during forced inhalation and exhalation</p>	Posterior iliac crest	Last rib Transverse processes of first through fourth lumbar vertebrae
Diaphragm (61a)	<p>Draw down the central tendon of the diaphragm Increase the volume of the thoracic cavity during inhalation</p>	<p>Costal Attachment Inner surface of lower six ribs</p> <p>Lumbar Attachment Upper two or three lumbar vertebrae</p> <p>Sternal Attachment Inner part of xiphoid process</p>	Central tendon
Multifidi and Rotatores (76a)	<p>Unilaterally Rotate the vertebral column to the opposite side</p> <p>Bilaterally Extend the vertebral column</p>	<p>Multifidi Sacrum and transverse processes of lumbar through cervical vertebrae</p> <p>Rotatores Transverse processes of lumbar through cervical vertebrae</p>	Spinous processes of lumbar vertebrae through second cervical vertebra (Multifidi span two to four vertebrae) (Rotatores span one to two vertebrae)
Flexor Digitorum Profundus (79a)	Flex the second through fifth fingers (metacarpophalangeal and distal interphalangeal joints) Assist to flex the wrist (radiocarpal joint)	Anterior and medial surfaces of proximal three-quarters of ulna	Bases of distal phalanges, palmar surface of second through fifth fingers
Flexor Pollicis Longus (79a)	Flex the thumb (interphalangeal joint) Flex the thumb (metacarpophalangeal and carpometacarpal joints) Assist to flex the wrist (radiocarpal joint)	Anterior surface of radius and interosseous membrane	Base of distal phalanx of thumb
Semispinalis Capitis (85a)	Extend the vertebral column and head	Transverse processes of C-4 to T-5	Between the superior and inferior nuchal lines of the occiput
Splenius Capitis and Cervicis (85a)	<p>Unilaterally Rotate the head and neck to the same side Laterally flex the head and neck to the same side</p> <p>Bilaterally Extend the head and neck</p>	<p>Capitis Inferior one-half of ligamentum nuchae and spinous processes of C-7 to T-4</p> <p>Cervicis Spinous processes of T-3 to T-6</p>	<p>Capitis Mastoid process and lateral portion of superior nuchal line</p> <p>Cervicis Transverse processes of C-1 to C-3</p>