

**Project 4.2.3:Student Resource Sheet – Muscle Building Tip Sheets**

**Group 1: Back**

Use the pictures shown in the atlas as well as those found on the Internet to construct the following muscles on your Maniken®. Information about the attachments of each muscle can be found below. Do not get hung up on complex descriptions of the location of origins and insertions. Use the simplified locations described below and relate this information to what you see in the drawings.

Make sure to striate the muscle in a way that shows the direction of pull.

Illustrations for this group of muscles can be found at Get Body Smart.com 2008 at <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html> (*Muscles that act on the Shoulder*)

**Rhomboideus major**

* Atlas #5 – Page 86
* Origin = Spinous processes (the bumps that stick out of the back of the spine) of vertebrae T2 to T5
* Insertion = Inferior half of the scapula
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Rhomboideus minor**

* Atlas #5 – Page 84
* Origin = Spinous processes of vertebrae C7 to T1
* Insertion = Superior edge of scapula; above the insertion for rhomboidieus major
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Levator scapula**

* Atlas #5 – Page 90
* Origin = Transverse processes (the bumps on the side of each vertebrate) of vertebrae C1 to C4
* Insertion = Medial margin of the scapula (the curved portion on the superior edge); above the insertion for rhomboidieus minor
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional building tips:**

* Identify the location of the cervical and thoracic vertebrate before you begin. You should refer back to your data from Activity 1.2.2 for a visual of these regions.
* Build these muscles in the order listed.
* View the action of each muscle on the Get Body Smart website, act it out and describe the motion on the lines above.

**Group 2: Back and Shoulder**

Use the pictures shown in the atlas as well as those found on the Internet to construct the following muscles on your Maniken®. Information about the attachments of each muscle can be found below. Do not get hung up on complex descriptions of the location of origins and insertions. Use the simplified locations described below and relate this information to what you see in the drawings.

Make sure to striate the muscle in a way that shows the direction of pull.

Illustrations for this group of muscles can be found at Get Body Smart.com 2008 at <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html> (*Muscles that act on the Arm* and *Muscles that act on the Shoulder*)

**Latissimus dorsi**

* Atlas #5 – Page 96
* Origin = Spinous processes (the bumps that stick out of the back of the spine) of vertebrae T7 to L5; also anchors to the top of the pelvic bone and ribs 9 to 12
* Insertion = Groove on front of the proximal humerus; near the insertion for the muscles of pectoralis major.
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Trapezius pars spinalis**

* Atlas #5 – Page 106
* Origin = Spinous processes of vertebrae T4 to T12 (overlaps a small part of the latissimus dorsi)
* Insertion = Superior portion of the scapula (the groove at the bottom of the inferior edge of the clavicle)
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Trapezius pars acromialis**

* Atlas #5 – Page 108
* Origin = Spinous processes of vertebrae C6 to T3.
* Insertion = Superior portion of the scapula (the groove behind the clavicle); above the insertion for the trapezius pars spinalis.
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Trapezius pars clavicularis**

* Atlas #5 – Page 110
* Origin = Inferior edge of occipital bone, continuing down to C6
* Insertion = Superior border of the last lateral third of the clavicle; once the origin is attached, the muscle will curve around the neck to the clavicle
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional building tips:**

* Identify the location of the cervical, thoracic and lumbar vertebrate before you begin. Refer back to your data from Activity 1.2.2 for a visual of these regions.
* The insertion of the latissimus dorsi is very close to that of the muscle of pectoralis major. Depending on how thick you made your chest muscles, you may have to “fake” the insertion of latissimus dorsi.
* Find a picture of the entire trapezius muscle and note its overall shape. The trapezius muscle has three parts. Build each one separately and in the order they are listed.
* Note the location of an *aponeurosis* in the middle portion of the trapezius. Aponeuroses are membranes made of connective tissue that separate muscles from one another.
* View the action of each muscle on the Get Body Smart website, act it out and describe the motion on the lines above.

**Group 3: Rotator Cuff (Partial)**

Use the pictures shown in the atlas as well as those found on the Internet to construct the following muscles on your Maniken®. Information about the attachments of each muscle can be found below. Do not get hung up on complex descriptions of the location of origins and insertions. Use the simplified locations described below and relate this information to what you see in the drawings.

Make sure to striate the muscle in a way that shows the direction of pull.

Illustrations for this group of muscles can be found at Get Body Smart.com 2008 at <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html> (*Muscles that act on the Arm*)

**Teres minor**

* Atlas #3 – Page 3.4 (CD Atlas p. 30-31)
* Origin = Middle part of lateral border of the scapula
* Insertion = Most dorsal facet of greater tuberosity of humerus (large bump at the end of the bone)
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Infraspinatus**

* Atlas #3 – Page 3.6 (CD Atlas p. 32-33)
* Origin = Large inferior fossa (flat space) on the back of the scapula
* Insertion = Middle facet of greater tuberosity of humerus
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Supraspinatus**

* Atlas #3 – Page 3.8 (CD Atlas p. 34-35)
* Origin = Smaller superior fossa on back of scapula
* Insertion = Top facet of greater tuberosity of humerus
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Teres major**

* Atlas #3 – Page 3.10 (CD Atlas p. 36-37)
* Origin = Bottom edge of dorsal scapula
* Insertion = Medial edge of groove in humerus at about a third of its length from the shoulder (on ventral side)
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional building tips:**

* Before you build, examine the greater tuberosity of the humerus. You used this bony landmark to help identify skeletal remains in P1.2.3.
* Examine and research the structure of the scapula.
* Remember that a fossa is a flat surface on a bone.
* Note that the teres major is not part of the rotator cuff muscle group.
* View the action of each muscle on the Get Body Smart website, act it out and describe the motion on the lines above.

**Group 4: Flexors and Extensors of the Digits (Hand)**

Use the pictures shown in the atlas as well as those found on the Internet to construct the following muscles on your Maniken®. Information about the attachments of each muscle can be found below. Do not get hung up on complex descriptions of the location of origins and insertions. Use the simplified locations described below and relate this information to what you see in the drawings.

Make sure to striate the muscle in a way that shows the direction of pull.

Illustrations for this group of muscles can be found at Get Body Smart.com 2008 at <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html> (*Muscles that act on the Wrist, Palm and Digits*)

**Extensor pollicis longus**

* Atlas #3 – Page 3.36 (CD Atlas p. 62-63)
* Origin = Dorsal ulna about a third of the way down from elbow (near membrane between the bones)
* Insertion = Base of distal phalange of the thumb on the dorsal side
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Extensor digitorium**

* Atlas #3 – Page 3.40 (CD Atlas p. 66-67)
* Origin = Lateral epicondyle of humerus (bump at elbow)
* Insertion = Dorsal surfaces of the distal phalanges of the 2nd to 5th digits
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Flexor pollicis longus**

* Atlas #3 – Page 3.46 (CD Atlas p. 72-73)
* Origin = Anterior surface of the radius (across membrane between the bones)
* Insertion = Base of distal phalange of the thumb on the ventral side
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Flexor digitorium superficialis**

* Atlas #3 – Page 3.54 (CD Atlas p. 80-81)
* Origin = Medial epicondyle (bump) of humerus and coronoid process of ulna; upper anterior surface of radius
* Insertion = Ventral surfaces of middle phalanges of the 2nd to 5th digits
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional building tips:**

* Review the location of extensors and flexors on the forearm. Refer to the muscle name to determine if the muscle runs on the dorsal or ventral side of the arm.
* Build these muscles in the order listed.
* Build individual muscles to each of the fingers.
* The flexor digitorum superficialis is composed of three heads that come together at the elbow. This muscle has some attachment to the humerus, ulna and radius.
* View the action of each muscle on the Get Body Smart website, act it out and describe the motion on the lines above.

**Group 5: Flexors and Extensors of the Digits (Foot)**

Use the pictures shown in the atlas as well as those found on the Internet to construct the following muscles on your Maniken®. Information about the attachments of each muscle can be found below. Do not get hung up on complex descriptions of the location of origins and insertions. Use the simplified locations described below and relate this information to what you see in the drawings.

Make sure to striate the muscle in a way that shows the direction of pull.

Illustrations for this group of muscles can be found at Get Body Smart.com 2008 at <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html> (*Muscles that act on the Foot*)

**Flexor hallucis longus**

* Atlas #4 – Page 64
* Origin = Lateral edge of distal two thirds of the fibula (back of leg); comes medial at back of foot
* Insertion = Base and bottom of distal phalange of big toe
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Flexor digitorium longus**

* Atlas #4 – Page 66
* Origin = Middle half of tibia on the medial side
* Insertion = Base and bottom of distal phalanges on toes 2-5
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Extensor hallicus longus**

* Atlas #4 – Page 84
* Origin = Halfway down lower leg; dorsal surface of medial margin of fibula
* Insertion = Dorsal base of distal phalange of the big toe
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Extensor digitorium longus**

* Atlas #4 – Page 86
* Origin = Proximal end of fibula; lateral condyle
* Insertion = Middle and distal phalanges of digits 2-5.
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional building tips:**

* Review the terms extension and flexion. In Activity 4.2.1, you learned about the action and location of flexors and extensors in the arm. Now, flex and extend your foot. Refer to the muscle name to determine if the muscle runs on the dorsal or ventral side of the foot.
* Build these muscles in the order listed.
* To build the flexors of the foot, you will have to wrap the clay muscle underneath the base of the Maniken®. Do not worry if you can not make it all the way to the base of the toes. Simply wrap the clay over the edge and make it look as if it continues to the toes.
* Note the thickness of muscles that control the big toe versus the other four toes.
* View the action of each muscle on the Get Body Smart website, act it out and describe the motion on the lines above.

**Group 6: Quadriceps**

Use the pictures shown in the atlas as well as those found on the Internet to construct the following muscles on your Maniken®. Information about the attachments of each muscle can be found below. Do not get hung up on complex descriptions of the location of origins and insertions. Use the simplified locations described below and relate this information to what you see in the drawings.

Make sure to striate the muscle in a way that shows the direction of pull.

Illustrations for this group of muscles can be found at Get Body Smart.com 2008 at <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html> (*Muscles that act on the Leg*)

**Vastus medialis**

* Atlas #4 – Page 96
* Origin = Medial side of femur; in line with bottom of pelvic bone
* Insertion = Medial patella; on proximal end of tibia
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Vastus lateralis**

* Atlas #4 – Page 98
* Origin = Lateral edge of femur on the greater trochanter (bump on outside lateral edge of femur)
* Insertion = Lateral patella to lateral side of proximal tibia
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Rectus femoris**

* Atlas #4 – Page 100
* Origin = Anterior lateral edge of pelvic bone under the illium
* Insertion = Across patella and attached to the intermediate tibial tuberosity (directly between insertion for the two vastus muscles)
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Sartorius**

* Atlas #4 – Page 122
* Origin = Anterior edge of pelvic bone; halfway down illium
* Insertion = Runs on medial side past the knee and attaches to proximal tibia medial to the tibial tuberosity
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional building tips:**

* Locate the quadriceps on your own legs.
* Review the anatomy of the pelvic bone on your Skeletal System graphic organizer. Use the illium as a landmark to build the rectus femoris.
* Build these muscles in the order listed.
* Use the pictures and diagrams to locate the insertion points around the knee. Make sure you know which bone if the tibia and which bone if the fibula.
* The insertions for the vastus lateralis and vastus medialis will cross paths.
* View the action of each muscle on the Get Body Smart website, act it out and describe the motion on the lines above.

**Group 7: Gluteus**

Use the pictures shown in the atlas as well as those found on the Internet to construct the following muscles on your Maniken®. Information about the attachments of each muscle can be found below. Do not get hung up on complex descriptions of the location of origins and insertions. Use the simplified locations described below and relate this information to what you see in the drawings.

Make sure to striate the muscle in a way that shows the direction of pull.

Illustrations for this group of muscles can be found at Get Body Smart.com 2008 at <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html> (*Muscles that act on the Posterior thigh*)

**Gluteus minimus**

* Atlas #4 – Page 42
* Origin = The lower gluteal fossa on the lateral surface of the illium; midway across illium on the posterior side
* Insertion = Anterior surface of the greater trochanter of the femur (the large bump at the proximal end of the femur)
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Gluteus medius**

* Atlas #4 – Page 44
* Origin = Superior edge of illium (covering the upper gluteal fossa) on posterior side
* Insertion = Lateral surface of the greater trochanter of the femur
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Gluteus maximus**

* Atlas #4 – Page 120
* Origin = Surface of posterior illium; One attachment begins from each side of superior edge
* Insertion = Lateral edge of proximal femur; a third of the way down leg. The IT band extends to the lateral tibial condyle.
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional building tips:**

* Review the anatomy of the pelvic bone on your Skeletal System graphic organizer. Use the illium as a landmark to build the gluteus muscles.
* Remember that a fossa is a flat surface on a bone.
* Build these muscles in the order listed. Before you build, make sure your Maniken® is oriented so the posterior side is facing you.
* The gluteus medius will almost completely cover the gluteus minimus.
* Gluteus maximus has two insertion points on the top of the posterior illium. These attachments form a “V” shape. Note that the muscle is also drawn to show the long iliotibial band that runs down the side of the leg. The IT band is a tough band of fibrous tissue that run along the thigh and helps stabilize the knee during running or walking. The upper portion attaches to the gluteus and the lower portion attaches to the tibia. You may want to create this band using a different color of clay.
* View the action of each muscle on the Get Body Smart website, act it out and describe the motion on the lines above.

**Group 8: Hamstrings**

Use the pictures shown in the atlas as well as those found on the Internet to construct the following muscles on your Maniken®. Information about the attachments of each muscle can be found below. Do not get hung up on complex descriptions of the location of origins and insertions. Use the simplified locations described below and relate this information to what you see in the drawings.

Make sure to striate the muscle in a way that shows the direction of pull.

Illustrations for this group of muscles can be found at Get Body Smart.com 2008 at <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html> (*Muscles that act on the Posterior thigh*)

**Semimembranosus**

* Atlas #4 – Page 112
* Origin = Inferior edge of ischium ; lateral facet of the ischial tuberosity (bump at the bottom of the ischium)
* Insertion = Posterior medial condyle of tibia
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Semitendinosus**

* Atlas #4 – Page 114
* Origin = Inferior edge of ischium ; medial facet of the ischial tuberosity (bump at the bottom of the ischium)
* Insertion = Proximal tibia; medial to tibial tuberosity (comes to front of leg)
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Biceps femoris**

* Atlas #4 – Page 116
* Origin = Inferior edge of ischium ; aligns with the origin for the other two muscles
* Insertion = Lateral side of the head of the proximal fibula
* Action = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional building tips:**

* Locate the hamstrings on your own legs.
* Review the anatomy of the pelvic bone on your Skeletal System graphic organizer. Use the ischium as a landmark to build the hamstring muscles.
* Build these muscles in the order listed. Make sure your Maniken® is oriented so the posterior side is facing you.
* The origins of the three muscles of the hamstring converge at a common tendon.
* Biceps femoris consists of two heads. You are only required to build the long head of the muscle, but you may add the short head for a challenge. Use the atlas photographs and other resources on the Internet to visualize this portion of the muscle.
* View the action of each muscle on the Get Body Smart website, act it out and describe the motion on the lines above.