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| **Project 4.2.3: Maniken® Mystery Muscles**  |

Introduction

As you built the muscles of the chest, you saw that one movement is often the result of the coordination of many skeletal muscles. Each action we complete in a given day, from brushing our teeth to walking the dog, comes down to the organization and action of this amazing human tissue. We bend. We stretch. We push our bodies to the limit and although they may get tired, our muscles rarely fail us. These muscles work in coordinated groups with our bones at joints, allowing us to interact with the world.

In this project, you are responsible for researching and building a particular muscle group on your Maniken®. This time you are on your own. Following the rules of muscle function and of muscle building you have learned, you will find attachments of each muscle in your group and create a replica on your model. You will also describe the action of the muscle. Work with your team to make your Maniken® come alive. You will then “tour” muscle groups you did not build and work to identify the action and name of a mystery muscle in each constructed group. As you tour this display of Maniken® muscle groups, you will see the amazing architecture of the human form and will gain a better understanding of the variety of muscles that control movement at the most basic level.

Equipment

* Anatomy in Clay® Maniken®
* Muscle building tip sheets
* Computer with Internet access
* Terra cotta clay
* Wire tool or wooden knife
* Myologik™ muscle atlases
* Toothpicks and labels for tape flags
* Markers or colored pencils
* Muscular system graphic organizers (front and back view)
* Laboratory journal

Procedure

1. Work with a partner to build a group of muscles on your Maniken®. Your teacher will assign you one of the muscle groups of the arm, leg, shoulder, back, or hip.
2. Find the other pair in the class that is working on the same muscle group. Even though you are both responsible for building the muscle group on your own model, you will work as a team of four to research the makeup of the muscles, discuss placement of the tissue and share building tips.
3. Obtain a muscle building tip sheet for your particular group of muscles from your teacher. This sheet will list the muscles you are responsible for building on your Maniken®. Use these tips as well as the listed muscle atlas pages to investigate the placement and function of each muscle.
4. View the muscles you are asked to build at Get Body Smart – An Online Examination of Human Anatomy and Physiology accessible at <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html>. Use this Internet site to learn about each muscle and to watch the muscle in motion.
5. Work through the same process you used to build the muscles of the chest.
6. Review the attachments as they are listed in the atlas and on your tip sheet. Locate the origin and insertion of each muscle. The terminology for attachments of muscles can be scary, but do not worry. Read through the simplified descriptions on the tip sheet and try to match what you see in words to what you see in the muscle atlas picture.
7. Build each muscle on the Maniken®. Add the striations to the muscle and then act out the action with your group.
8. For each muscle you build on your model, write down the following in your laboratory journal:
* Name of the muscle
* Location of the origin and the insertion of the muscle
* The action of the muscle
* A sport or activity that utilizes this muscle
* The type of joint spanned by the muscle
1. Sketch the muscles you have built on your muscular system graphic organizer. If the muscles you are building are on the back, obtain an additional graphic organizer and label this document “Muscular system – Posterior view.”
2. Use toothpicks and labels to make tape flags and use these flags to label the new muscles you have added to your Maniken®. Each flag should be numbered and the number should correspond to a particular muscle. On the flag, write the name of the muscle as well as a simple description of the action of the muscle.
3. Note that one muscle in the group you have built will not be labeled and will be deemed the “Mystery Muscle.” As other teams visit your model, they will be responsible for analyzing this muscle and determining:
* action of the muscle (Remember- look at the striations!)
* a sport or activity that utilizes this muscle
* an appropriate name for the muscle
1. With your team, come to consensus about which muscle in the group would make the most interesting “Mystery Muscle.” NOTE: Focus on a muscle that follows the naming rules you have discussed earlier. Label this muscle with a “?.”
2. Create a sign for your station identifying the muscle group you have on display. Display both Manikens®. Visiting groups of four can split into pairs and each view one Maniken®.
3. When all teams are finished building and labeling, visit each muscle group station.
4. Create a page in your laboratory journal that is titled “Mystery Muscles.” For each stop on your tour, list the group name (ex. Back) and then work with your partner to analyze structure and function of the mystery muscle in that group. Brainstorm the items listed in Step 11 and write your findings in your laboratory journal.
5. When naming the muscle, think about the other muscles in the group and about the way in which you have seen other muscles named. The name you come up with does not have to be the exact name of the muscle, but this name should make sense given what you see. Be prepared to explain the rationale for your name to the group. Prizes may be awarded for the most creative name as well as for name closest to that of the actual muscle.
6. Return to your original station. Be prepared to share information about the identity of your mystery muscle.
7. Review the mystery muscles as a class.
* Intercostal muscles are several groups of muscles that run between the ribs, and help form and move the chest wall.
* Pectoral Muscles- The two pectoralis major muscles, commonly referred to as the "pecs," are the muscles that create the bulk of the chest

Conclusion

1. What did you find to be the most challenging part of independent muscle building?

The most challenging part of independent muscle building is placing them on the model in the exact place.

1. How can you determine function of a muscle simply by looking at the anatomy?

Based on which bone or joint the muscle is surrounding that can help determine the anatomy of the muscle.

1. Choose one of the mystery muscles you encountered on your tour. Explain how you came up with the name for this muscle.

3 types of muscle are smooth skeletal and cardiac.

1. Using your muscular system graphic organizer and your notes, identify and describe the particular muscles that are involved in generating movement at a specific joint of the body.

Muscles are made up of thousands of fibers that can contract and relax. In joints muscles work in pairs by when one muscle contracting the other one relaxes.

1. Describe how an injury to the muscle group you built on your Maniken® would impact total body function.

In injury to a muscle group can affect other muscle groups by making them stronger. For example a person who might not have control of their lower part of the body can make their upper portion stronger to support their selves.