

Bones & Muscles Independent Project

Your overall goal is to construct a working model of either the elbow or knee—complete with muscles, bones, tendons, cartilage, and ligaments. Although they are functionally different, the elbow and knee have similar muscles, bones, and movements. Through successful completion of this project, you will become intimately familiar with the muscles and bones of either the arm or leg, as well as the similarities and differences between these appendages. We also expect that you will master the origin, insertion, and action of the major muscles.

Rules of the Project

1. **THIS IS NOT AN EXPRESSIVE PIECE.** The purpose is to demonstrate where and how the muscles are attached to the bones, how they act on the bones during movement, and how the bones are connected. However, there is quite a bit of room for creativity in terms of the materials you use and how you use them.
2. Total maximum expenditure on your model is \$20.00.
3. Your model must be life size or larger.
4. The model must include all the structures and you must use a unifying theme for each type of tissue. **This means that all the bones should be made of the same material and should be the same color. This also applies to the muscles, tendons, ligaments, cartilage, etc.**
5. You must prepare a key or legend for your model identifying the various tissue types. For example, your key may show that all the blue rubber bands are skeletal muscles.
6. **Before You Start Construction.** With your partner, you must outline a detailed design plan for your model and both agree on it.
7. As you build and test your model, your design may be modified. You must document the construction-modification-redesign process, as well as outlining the changes to your initial design.

The Final Result

1. The final product will consist of your working model, a key to the tissue types, and a one-page summary of the process. Both the key and process summary should be neatly printed to be easily readable at a distance of three feet.
2. **Your model is due on Wed Nov 30th.** All the models will be displayed and the entire class will walk around and evaluate the models.

Evaluation Criteria

1. How well does it demonstrate the working of the joint? Specifically, does it show how the muscles move the bones?
2. Are the origins and insertions of the muscles easy to distinguish?
3. Are the different tissue types easy to distinguish from one another? Is the key or legend clear and concise?
4. How detailed is the model? Does it show the interactions/connections between the various types of tissues?