

# Muscles of Mastication Group

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## Problem Statement

In veterinary anatomy education, there is a notable absence of interactive, hands-on models that illustrate the muscles of mastication for both carnivores and herbivores. This gap limits students' ability to engage in effective learning and understanding of the complex relationships between muscular and bony structures. Our goal is to develop two models that accurately replicate the anatomy of mastication muscles in two carnivores and herbivores allowing for the visualization of muscle function and clearly define individual muscles to enhance educational outcomes.

## Brief Status Update

We have printed the skulls! We are now working on developing prototype muscles to 3D print in multiple materials for tensile testing.

## Summary of Weekly Team Member Design Accomplishments

- Team:
  - 3D print the skulls
- Jensen Weik:
  - Collected the skulls from the MakerSpace and cleaned off the supports
- Kaiya Merritt:
  - 3D printed the skulls from the MakerSpace
  - Met with the team to discuss upcoming goals and to see the finished printed skulls in person
- An Hua:
  - Updated cost and materials sheet
  - Discussed alternatives for muscles aesthetics with the team
- Noah Kalthoff:

- Played around in SolidWorks to try and figure out how to fabricate our muscles/springs
- Leah Nelson:
  - Researched resin filament mechanical properties
  - Met with team to see the printed skulls

## Weekly/Ongoing Difficulties

The MakerSpace informed us that TPU will not be elastic enough for the muscle. We are now looking into a design in which TPU or resin is printed in the shape of a spring for better elongation properties.

## Upcoming Team and Individual Goals

- Team:
  - Print a muscle material to begin testing
- Jensen Weik:
  - 3D print a muscle material
- Kaiya Merritt:
  - 3D print a muscle material
  - Start creating a testing protocol to test the two different muscle materials
- An Hua:
  - 3D print muscle material
  - Figure out testing protocol
- Noah Kalthoff:
  - Figure out how to accurately create a 3D printed spring that can stretch to what we want
- Leah Nelson:
  - 3D print muscle materials to test

## Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Meet with client	9/6	All	100%	9/13

Product Design Specification	9/19	All	100%	9/19 (ongoing with edits)
Preliminary Presentations	10/4	All	100%	10/4
Preliminary Report	10/9	All	100%	10/9
Show and Tell	11/1	All		
Poster Presentations	12/6	All		
Final Deliverables	12/11	All		

**Expenses**

<b>Horse Skull</b>				
<b>Item</b>	<b>Location Purchased</b>	<b>Quantity</b>	<b>Cost Each</b>	<b>Total Cost</b>
PLA	Makerspace	1	18.5	18.5
				0
				0
				0
				0
				0
				0
				0
				0
<b>Total:</b>				18.5

<b>Dog Skull</b>				
<b>Item</b>	<b>Location Purchased</b>	<b>Quantity</b>	<b>Cost Each</b>	<b>Total Cost</b>
PLA	Makerspace	1	13	13
				0
				0
				0
				0
				0
				0
				0
				0
				0
<b>Total:</b>				13