

**Project- Musclular System
Bionic Hand- Grip Strength (Challenge #2)**

Scenario

You are working with a team of engineers from a biomedical engineering company that specializes in the design and manufacturing of prosthetic devices. Your team's challenge is to design a prosthetic hand that has dexterity of a real hand to help improve the quality of life of the amputee who uses the prosthesis.

Task

Using the same hand from Challenge #1- Dexterity or, you and your partner will modify your prosthetic human hand. The prosthetic hand that you modify will perform a grip strength test similar to the one performed in physical therapy. You may build another hand only if teacher has approved so.

No instructions have been provided for you. You will document the modification of your hand by taking pictures, uploading them to a google presentation, and writing out your procedures for each picture. As an alternative, you may document your progress by taking pictures, narrating them, and creating a video slideshow. (5 points)

****You will need to work on this activity outside of class. You will NOT be given time to start the activity.**

****You will NOT be given time in class to finish the activity. You will only be given class time to present.**

Grading

Students will be graded on Grip Strength.

Grip Strength

1. How hard does your hand squeeze the hand dynamometer.

Strength of Grip

****Prosthetic hand must maintain a grip strength for 10 seconds. The average grip recorded will be graded.**

Rubric

- 5- 40-36 N, Hand was able to grip for full 20 seconds
- 4- 35-31 N, Hand was a able to grip for full 20 seconds
- 3- 30-26 N, Hand almost was able to maintain grip for 20 seconds
- 1- 25-21 N, Hand almost was able to maintain grip for 20 seconds

Questions

Answer each question on a different slide. Place the questions at the end of your presentation.

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| 1. Knowing that you will be graded on the strength of your hand's grip, how did modify your hand? | 3 points |
| 2. How did you test your hand's grip strength? | 3 points |
| 3. How did your hand perform compared to the class average grip strengths- worse, better, or at the class average? | 1 point |

Based on your answer from #3, answer one of the questions below.

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| 3a. If your hand performed worse than the class average, why did it perform that way? | 3 points |
| What would you modify in your design so that it performed at average grip strength or better? | 2 points |
| 3b. If your hand performed better than the class average, why did it perform that way? | 3 points |
| What would you modify in your design so that it performed at better grip strength? | 2 points |
| 3c. If your hand performed at the class average, why was your grip strength better than worse and worse than better? | 3 points |
| What modifications in your design allowed your grip strength to be above worse? | 2 points |

Total Points

/ 22
