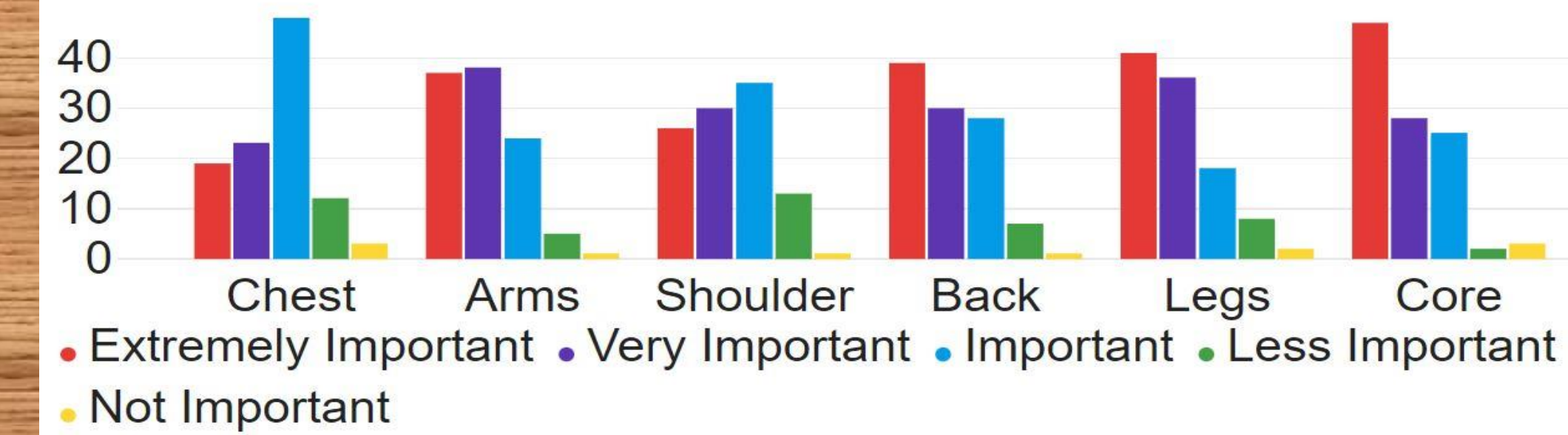
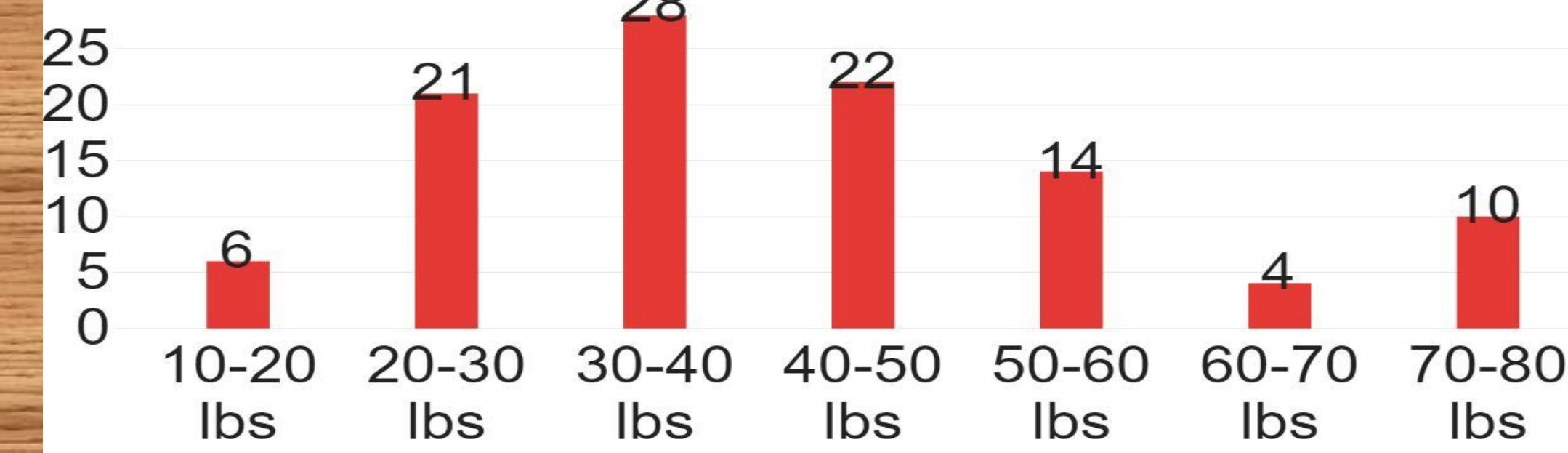


Research Data Based On Survey

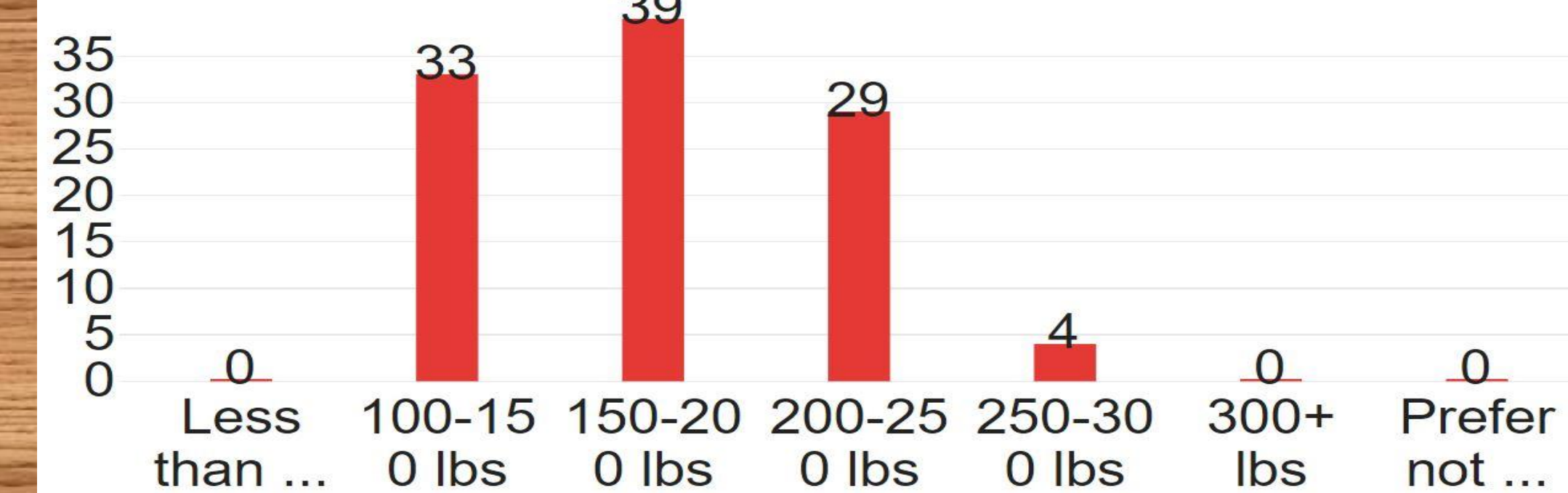
Rate the importance of working out these muscle groups:



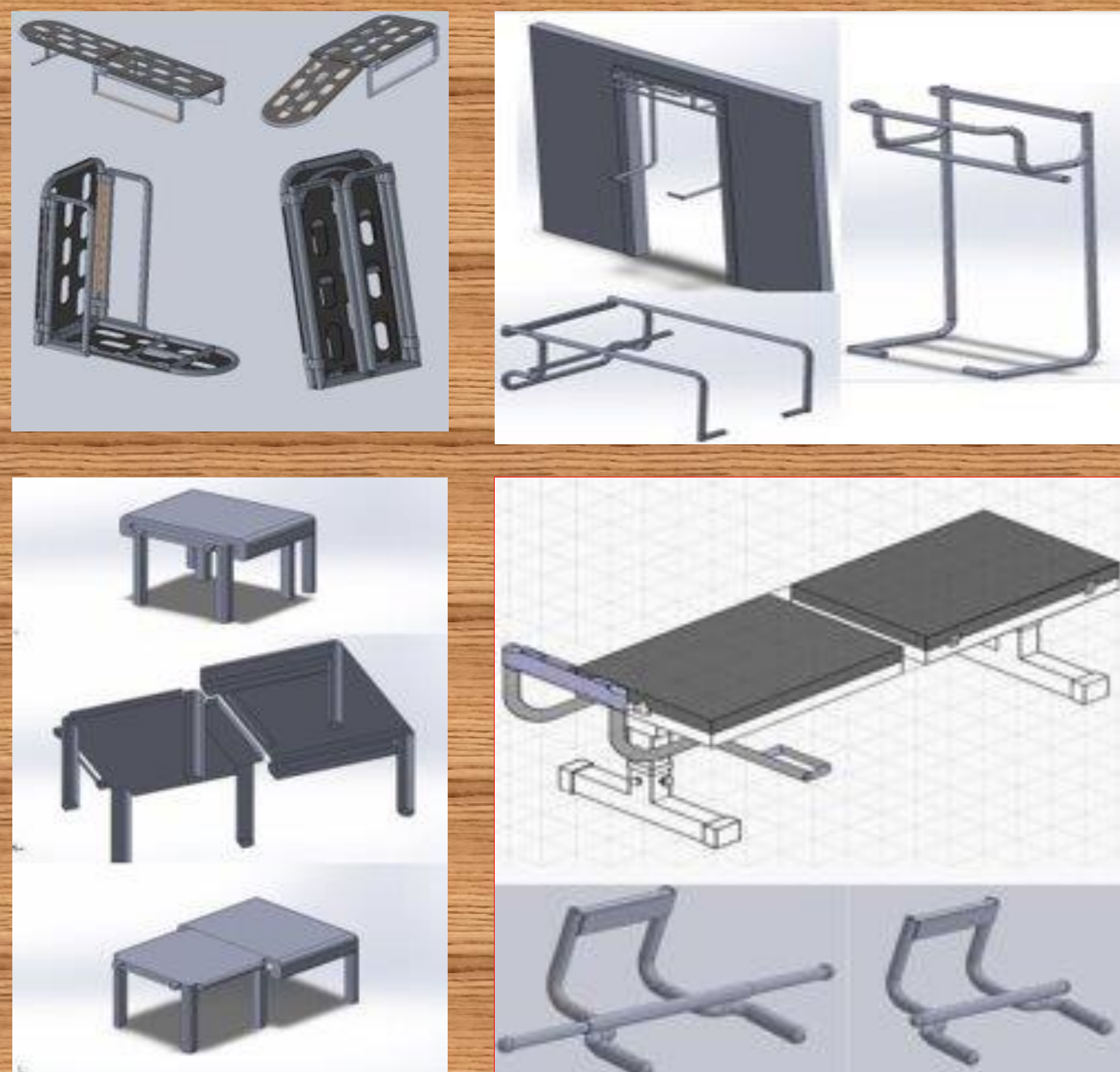
What is a desirable maximum weight for portable exercise equipment?



What is your weight in pounds?

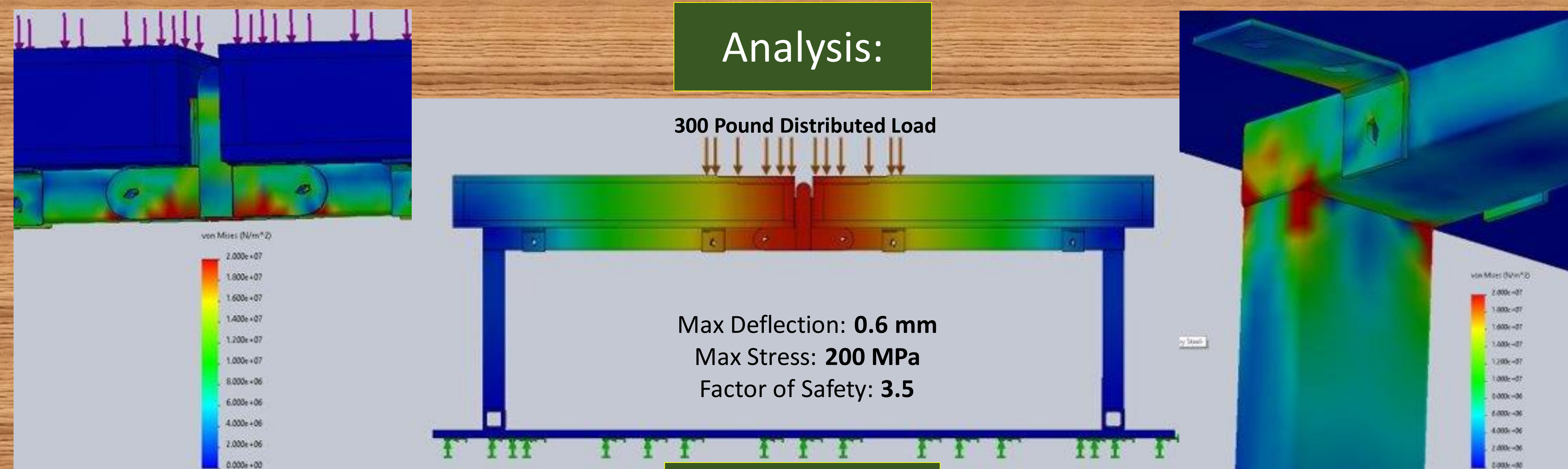


Preliminary Designs



Objective: Due to the onset of the COVID-19 Pandemic, it has become difficult to go to the gym. Our objective is to create a product that allows you to *stay in shape while staying in*. This product will be light, collapsible, and focus on a wide range of bodyweight exercises for all ages.

Analysis:



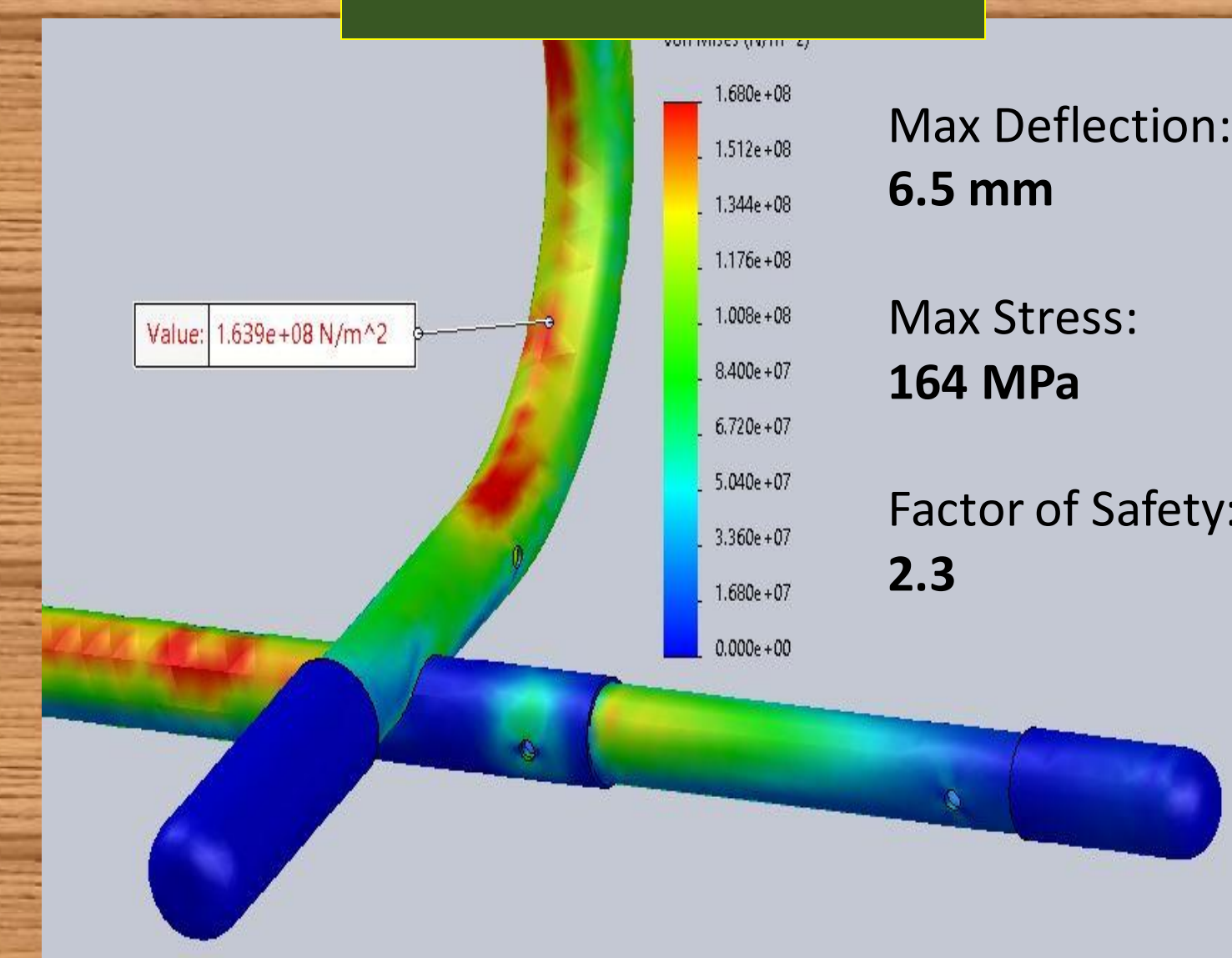
Hand Calculations

Curved Beam Equation

$$\sigma_i = \frac{F}{A} + \frac{Mc_i}{Aer_i}$$

$$\sigma_i = 168.025 \text{ MPa}$$

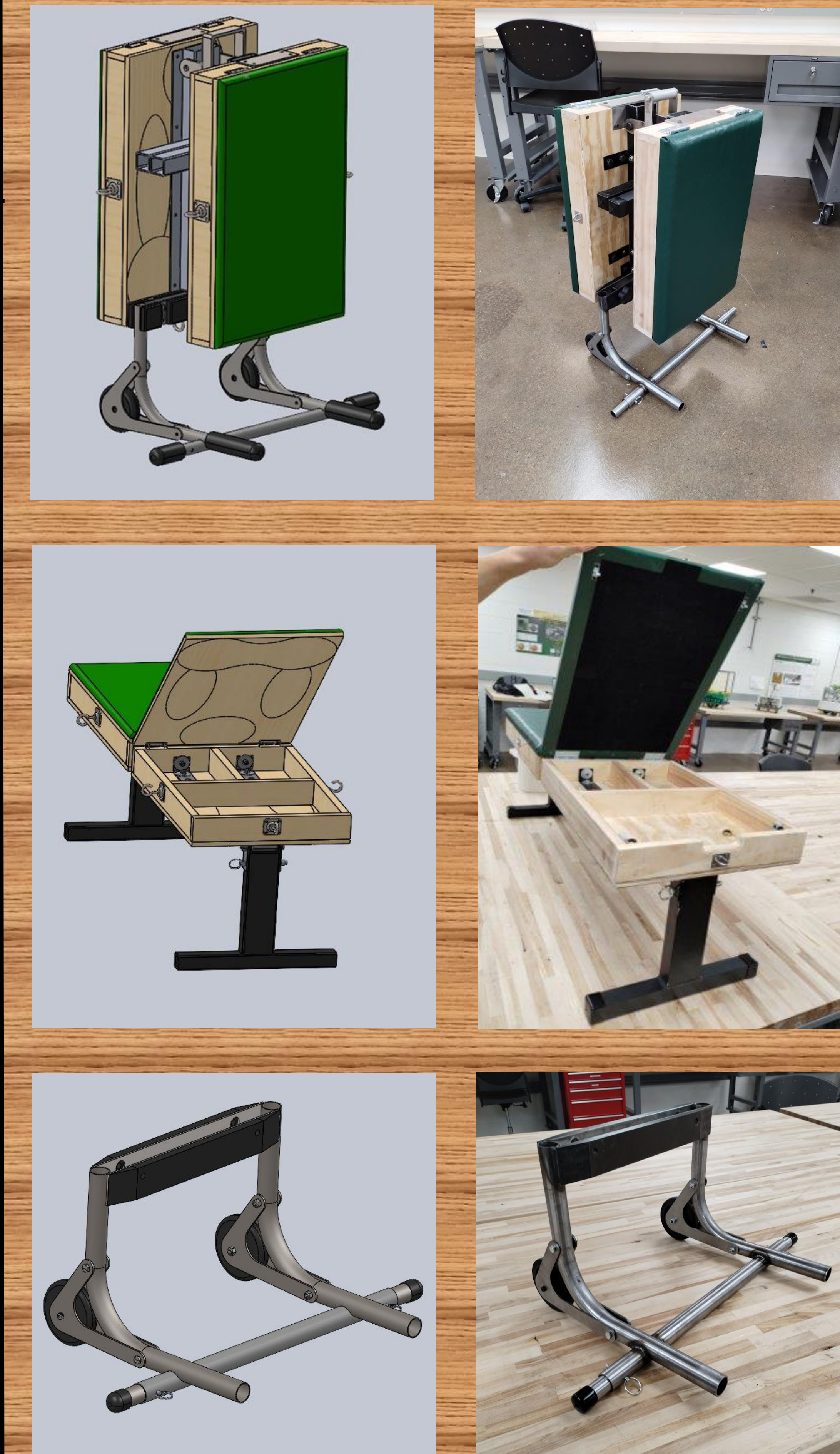
FEA



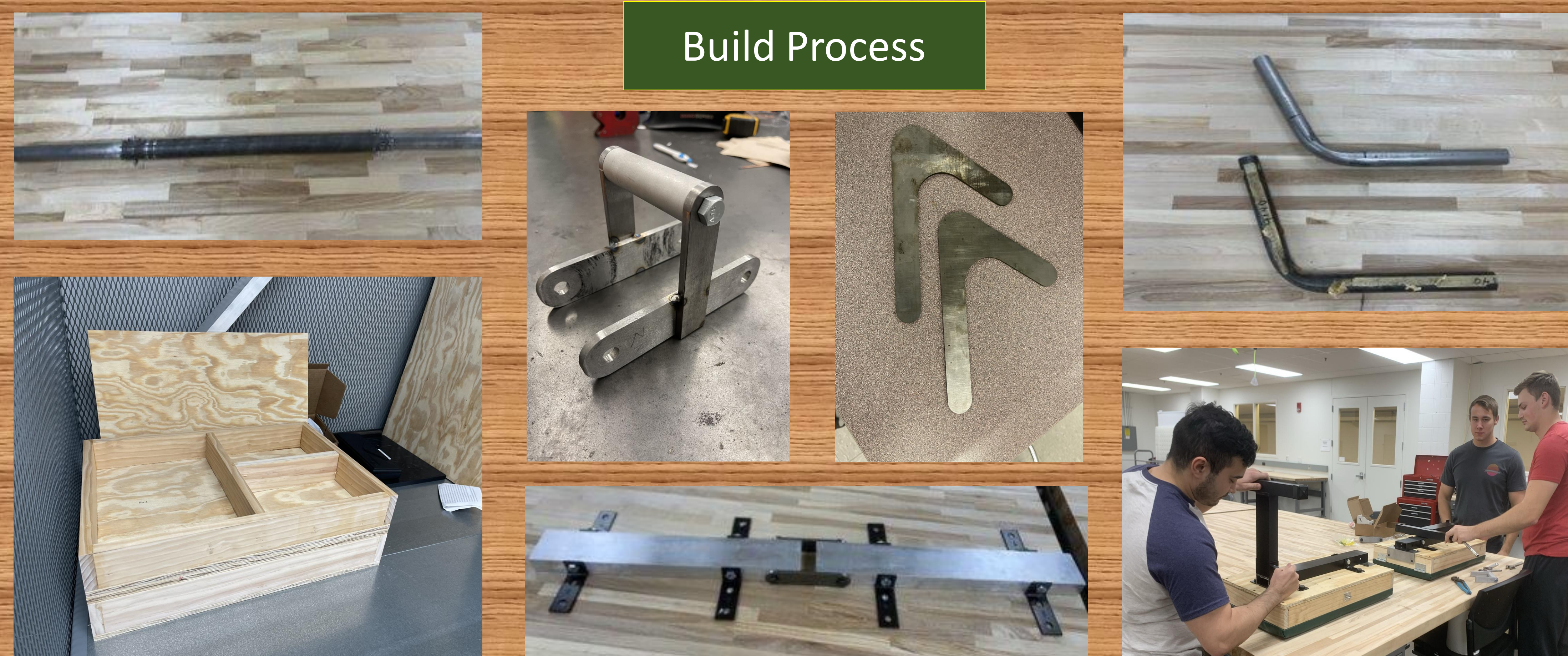
Strain Test

	Load (lb)	Stress
Trial 1	300	1.619E+08 pa
Trial 2	300	1.583E+08 pa
Trial 3	300	1.593E+08 pa

Final Design



Build Process



Product In Use



Advisor: Dr. Nathan Klingbeil

Special Thanks: Dylan Christman, Brad Cripe, John Lawless