Design Project 1:

The object of our first design project was to design a mug to be used by disabled individuals who have missing fingers on their hands.

To design a cost effective mug that was easy to use we utilized the engineering design process.

Design Process:

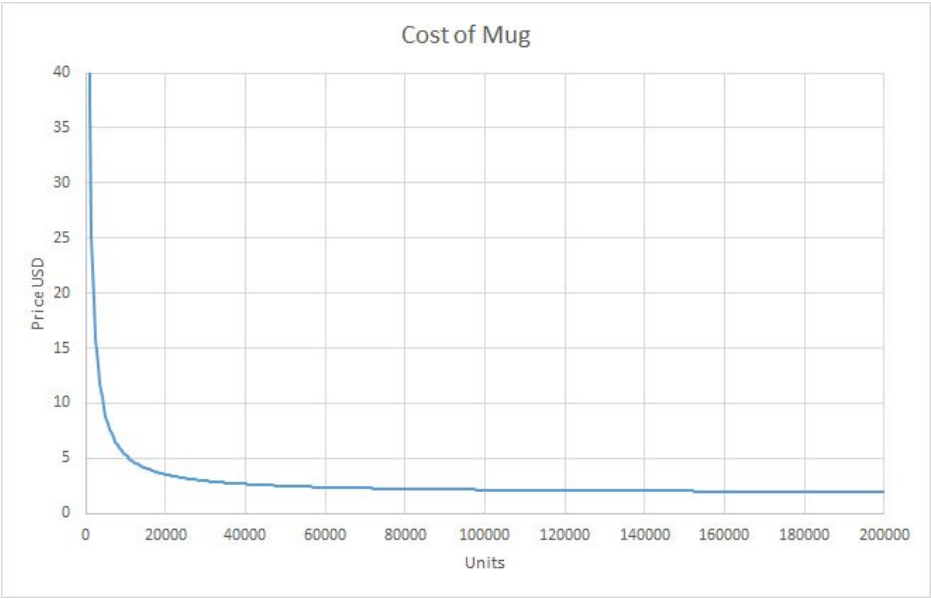
1. Analyze customer needs
2. Analyze current market offerings through the use of patent searches
3. Revise design statement
4. Generate concepts in our group
5. Utilize the concept compatability chart and analytical hierarchy process (AHP) to select concepts
6. Design prototype with clay and 3D modeling software

AHP TABLE:

Analytical Hierarchy Process (AHP)

Main Attribute	Appearance	Portable	Flexible	Durable	User Friendly	Total (Ri)	Weighting (Wi)
Appearance	1	0.1666666667	0.1666666667	0.1428571429	0.1111111111	1.587301587	0.03448275862
Portable	6	1	1	0.8571428571	0.6666666667	9.523809524	0.2068965517
Flexible	6	1	1	0.8571428571	0.6666666667	9.523809524	0.2068965517
Durable	7	1.166666667	1.166666667	1	0.7777777778	11.11111111	0.2413793103
User Friendly	9	1.5	1.5	1.285714286	1	14.28571429	0.3103448276
Total R: 46.03174603							

Customer Needs Hierarchy:

1. **Portable** (0.207)
    - 1.1 Lightweight (0.107, 0.517)
    - 1.2 Fits in Cupholder (0.0286, 0.138)
    - 1.3 Lid/no Spill (0.0571, 0.276)
    - 1.4 Holds 16 oz. (0.0143, 0.0690)
2. **User Friendly (**0.310)
    - 2.1 Safe (0.0558, 0.180)
    - 2.2 Easy to wash (0.0418, 0.135)
    - 2.3 Small ecological footprint (0.00697, 0.0225)
    - 2.4 Comfortable (0.0523, 0.169)
    - 2.5 Can be held by disabled individual (0.0628, 0.202)
    - 2.6 Grip texture (0.0418, 0.135)
    - 2.7 Aerator (0.0209, 0.0674)
    - 2.8 Simplistic use of lid (0.0279, 0.0899)
3. **Durable (**0.241)
    - 3.1 Withstands dropping (0.0142, 0.0588)
    - 3.2 Reliable over lifetime of product (0.0994, 0.412)
    - 3.3 Withstands heat (0.128, 0.529)
4. **Appearance (**0.0345)
    - 4.1 Simple Design (0.0307, 0.889)
    - 4.2 Looks relatively normal (0.00383, 0.111)
5. **Flexible (**0.207)
    - 5.1 Insulates (0.179, 0.867)
    - 5.2 Ambidextrous (0.0276, 0.133)

Cost Analysis: