Name: _____ Date: _____ Class: _____

Off-Road Wheelchair Packet

Define the following terms

Mechanical engineering:

_____

_____

_____

Bioengineering:

_____

_____

_____

Biomedical engineering:

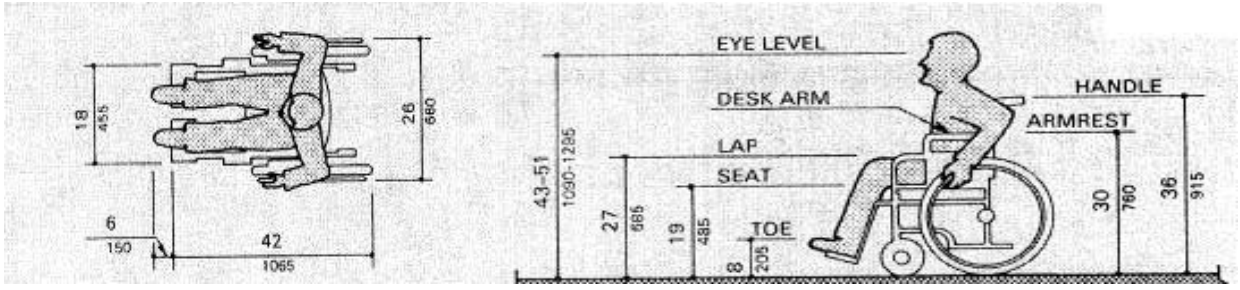
_____

_____

_____

Introduction

You work for an engineering company that specializes in making outdoor sporting equipment. The company has recognized that many people who are confined to wheelchairs enjoy outdoor activities such as light hiking or even mountain biking. Your role is to develop an off-road wheelchair design that enables this end user to access to formerly inaccessible outdoor activities.



ncbi.nlm.nih.gov

Client Statement

Create an off-road wheelchair for recreational purposes. The wheelchair should be easy to transport and operate, and be effective in traversing off-road terrain, such as trails, fields and beaches.

Problem Statement (Define the problem in detail)

_____

_____

_____

_____

_____

_____

Revised Problem Statement: (Definition of the problem in detail including client modifications)

_____

_____

_____

_____

_____

Functions (what the product <u>does</u>)

_____

_____

_____

_____

_____

Objectives (What the product is)

_____

_____

_____

_____

_____

_____

Constraints (The product must or must not)

_____

_____

_____

_____

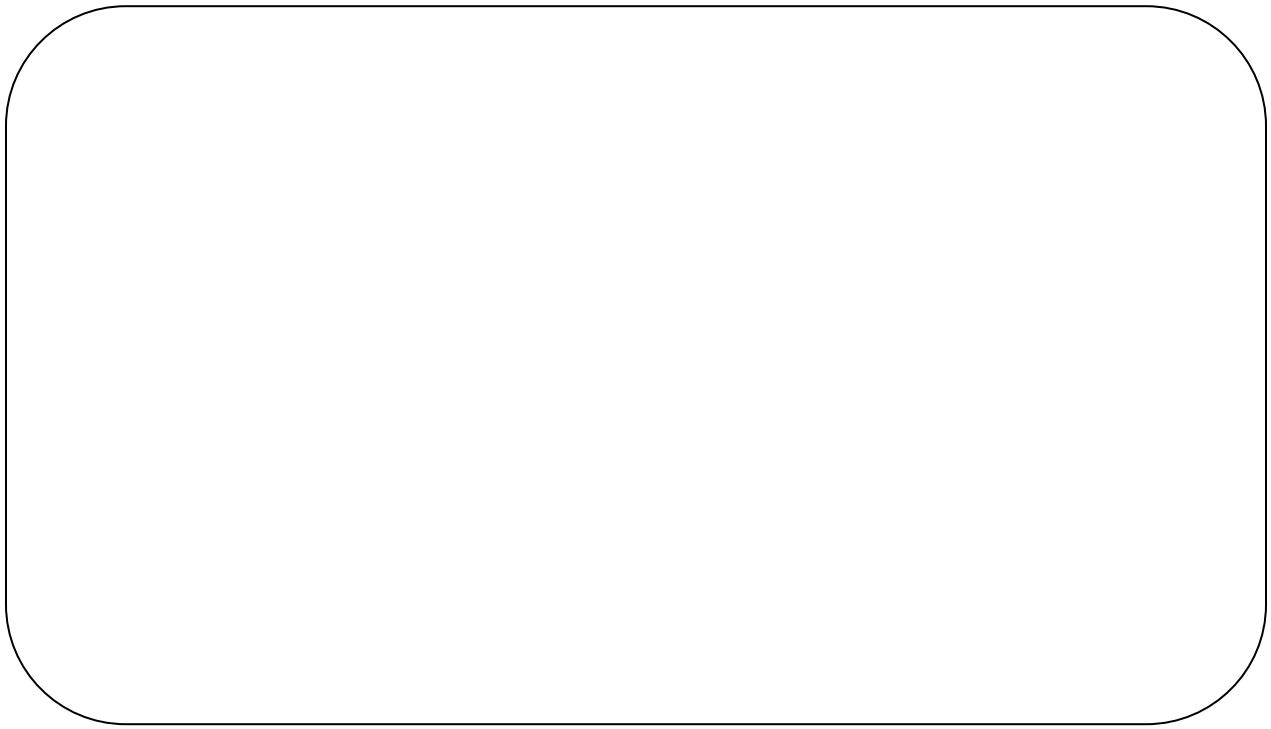
_____

_____

Background Research

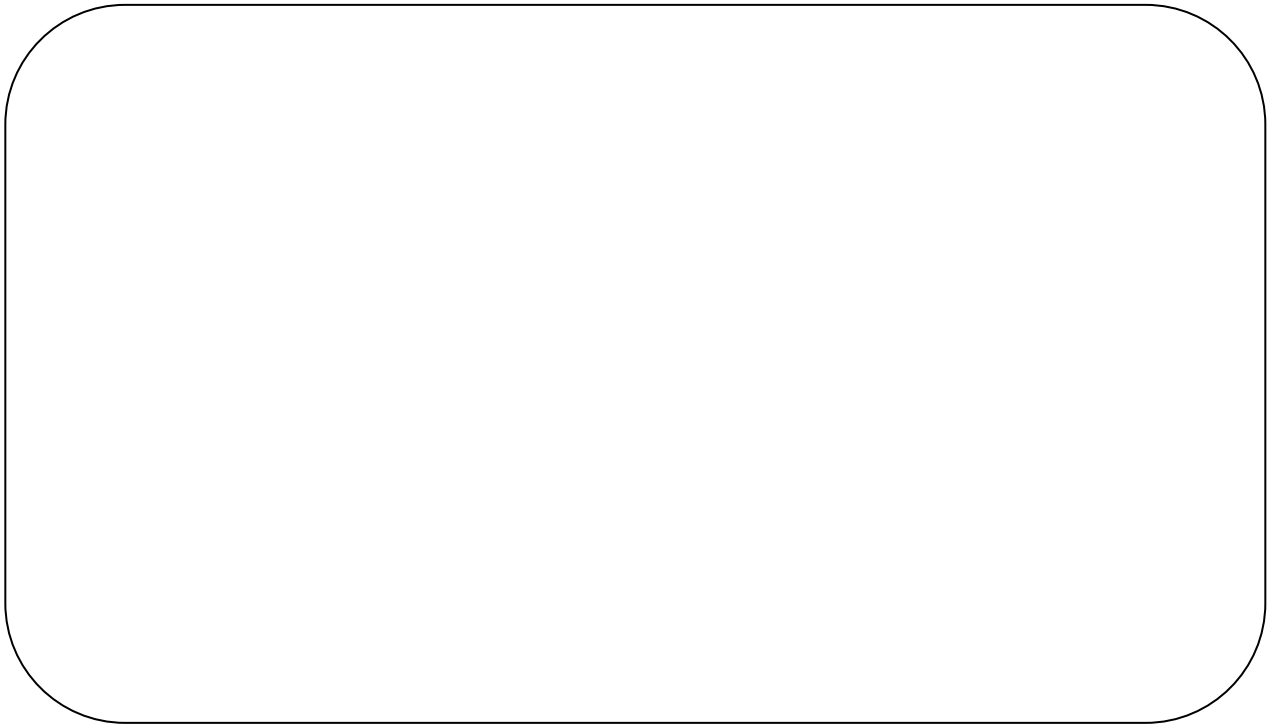
As homework, use the internet to research past and present wheelchair designs, off-road and mountain bikes, why people need wheelchairs, and other related topics. Keep a record of relevant material and source websites.

Design Solutions (Sketch and describe 3 possible solutions)



Design #1

Design #2



Design #3

Prototype Creation (describe why you chose the design you did)

_____

_____

_____

_____

_____

_____

Test Design

1. Attach the scale model wheelchair prototype design to the spring scale.
2. Pull your prototype wheelchair across the three simulated off-road surfaces.
3. Record the highest amount of force needed to move your prototype at any point during each movement simulation.
4. Record your data in the table.

Test Results (Complete the table and record the test results in detail)

(Force Measured In Newtons)	Trial 1	Trial 2	Trial 3
Beach			
Light Hike			
Field			

(Description of results) _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Evaluation of Results (Was your design effective? How do you know?)

_____

_____

_____

_____

_____

_____

_____

_____

_____

Future Recommendations (What you would recommend for future research)

_____

_____

_____

_____

_____

_____

_____

_____

_____