An Adaptive Sled for Kids

A) The necessity of the product is to provide children without any usage of their legs, to be able to use an adaptive sled with ease. It was meant to allow children to enjoy life without any obstacles in their way, if there is an obstacle, we would help them overcome their obstacles, so they can enjoy life as the same as anyone else.

B) We are following the design process in solving the problem we are given. We are determining what needs to be solved and making sure we are correct by working with the OTA’s. We are creating objections for ourselves. We are researching existing products and whether or not they are in the market. We are creating ideas on how we can solve the problem given to us. We will choose the best concept. Then, we will start construction of the product. Finally, we will run tests to make sure the product does what it is supposed to do.

C) We expect the child will be overjoyed as using a sled that they have full control as they go down the snow covered hill, as well as their guardian seeing that the child is safe in his or her sled as he or she comes down, with a smile on their face.

D) The estimate cost is to be under a hundred dollar. The reason why we as a team placed the price that low is because, of all the necessities a guardians may need to provide to their children, for an example a guardian may need to purchase a wheelchair and a car that is wheelchair accessible. As well as medical physician and healthcare for the child. With all that combine the guardian may not be able to purchase accessories for the child and only purchase the necessities. We hope to convince the guardian our prices is low enough is that is in acceptable range of their budget and allow the child to enjoy sledding as they could not before.

Objective:

- Why? We challenge ourselves to create a device to help other enjoy the hobby of sledding, at ease as an abled person would be able to.

Background:

- Who? The children with no lower extremity function
- Where? Anywhere someone can go sledding. In the backyard, at ski resort, and anywhere where it is safe enough to go sledding

While researching for the adaptive sled the main links that came up were for sleds for hockey, and the actual snow sled that came up when I checked the price was around $590. The only true snow sled that came up while researching that is a market was the snow coach in which the sled had multiple brakes and other safety features. While
looking at the snow coach I discovered its price to be far above what we are even given to make the adaptive sled. The cost shows that there needs to be a more competitive market for these types of sleds to bring a more affordable sled. The research also brought forth that few adaptive snow sleds even exist in the market and the hockey sled are what show up the most when google searched. Even the hockey sleds cost around $680 for the double amputee sled.

**Problems Statement:** To create a way a child, twelve years old and younger, with no lower extremity function to be able to use an adaptive sled.

**Goals:** To create a mechanism that allow a child with no lower extremity function to use an adaptive sled, with ease of both driving and breaking.

**Objectives:**
1. To put on multiple type of sleds.
2. **Breaking Mechanism**, to stop a sled within five seconds.
3. To have up to but no more than twenty-five degree turn radius.
4. An external part to allow guardian to push or pull the sled.
5. **Portability**, Less than three cubit feet.
6. **Weight**, No more than a hundred pound for the sled, itself. No more than a hundred-fifty pound for the overall weight, with the child included.
7. **Durability**, Need to last over a course of three years of moderate usage.
8. **Ease of use**, the target market is for children and it must be easy for them to use the sled.
9. **Safe**, the target market is for a child who have no use of legs. The sled must provide protection to keep the child on the sled and prevent sled in any way hurting the user. Lastly the sled must maintain it balance whenever in use to prevent the user from getting stuck.
10. **Comfortable**, a child could be very picky of using the product, we expect the kid would want to enjoy the fun without any complaint of the adaptive sled.
11. **Pass Regulation for a ski resort**, ski resort may ban certain type of sleds, and we need to make sure it can pass regulation, in order to allow the child go sledding as he or she please.

**Methodology:**

**How?**
- Attachable and detachable mechanism onto a sled
- Adaptive sled, design a whole sled for the target market
- Attach sled to wheelchair

**When:**
- Anytime, if there a nearby ski resort, or when there is enough snow presented to safely go sledding.

**Expected Result:**
• A functioning sled, that a child can use or a prototype without mass production.

Cost:
• No more than a hundred dollar

http://mobilitysports.com/products.html#!/Double-Amputee/c/1629265/offset=0&sort=normal

Timeline: We began our project with rewording the issue into a problem statement and creating an ideal goal for our project. Then we go for objectives, we wanted to reach while we create the idea of concepts for our adaptive sled. We checked with the OTA’s to make sure the ideas fit into what they were looking for. After we listed all the possible ways we could implement it design. We began selecting the best candidate for which concept should move on to the next phase. We kept the OTA’s involve with what basic design we would go with, but it will be our job to build the sled. As a team we eliminated concepts that would be too expensive or attachable mechanism that required to attach to certain type of sled that are not as common as the plastic sled. We would rate and rank the concepts to help with the elimination process and to choose the final concept to begin to create the product,