Work Completed

This week was again concentrated in the construction of the game. After working in the Machine Shop on Week 5, much need to be analyzed before any further work could be completed. It is decided that the bottom of the mold well will be used as the primary wheel (Fig. 1). This is going to save time in constructing a top wheel out of the foamed PVC. Not using the foamed PVC will also save on weight. The game must be picked up and transported by the nursing staff at the workshop. Thus having the game be as light as possible is optimal.

![Figure 1: Bottom of mold well](image)

It was found that the mold well is made out of polypropylene plastic. This is a rugged plastic that is often used in applications such as food packaging, textiles, laboratory equipment, loudspeakers and automotive parts. Most car bumpers are made out of polypropylene. In addition polypropylene is resistant to a variety of chemical solvents. Polypropylene has a very high melting temperature of three hundred and twenty degrees. This is optimal because heat will be produced due to the wheel spinning, even with the bearing block, so the plastic will thus not degrade. As was found earlier when the foamed PVC would be used to construct the main wheel, plastic is very hard to paint.
Thus painting methods were researched to find out if there was any easy and effective way to paint polypropylene. There is only two hundred dollars remaining in our budget, this it is optimal to be able to use the spray paint that is already purchased and to not have to purchase anything that is too expensive. It is found that paint will adhere to polypropylene when using a polypropylene primer that has direct adhesion. The paint can be directly applied on top of the primer followed by a topcoat, which was already purchased. Two types of primers were found: Bulldog Bond.Flex Tie Coat and BONDiT A-43. The Bulldog primer was found to be $11.95. Also recommended for polypropylene bumpers to be painted was a different painting method. This consisted of cleaning with Super Clean Plastic Cleaner from Urethane Supply Company then spraying with Bumper and Cladding Coat Adhesion Primer 3601-4. If this method would be used the cleaning product would not be used because the purpose of the product is to remove debris that is built up on bumpers of cars that have been on the road. The mold well is relatively clean besides the small amount of dirt that has accumulated due to travel. A visit to the hardware store and possibly the auto store is a must. We do not want to purchase something until it has been fully researched and found that it will work. There is no extra mold well to test the painting method on. Thus whatever method is chosen will be carried out on the mold well.

Problems with the motor were also analyzed. While in the machine shop it was determined that the motor we had purchased may not be optimal. The shaft of the purchased motor is not directly in the center of the motor (Fig. 2). Thus when being placed into the shaft coming from the wheel the motor must be offset. This will make the construction slightly more difficult, but possible. The motor that has been purchased requires 0.5 milliamps of current with 12 volts in order to run at 40 RPM. This motor also provides 2000 gcm of torque. Even though the shaft is not in the middle, these are these values are exactly what is needed to have the game function. Using a different motor with a centered shaft could compensate for some of these values, which in the end would not be optimal if the wheel does not spin. Due to the above and budget issues this motor may possibly need to be used.

Figure 2: Purchased Motor

Questions began to be constructed. It was determined to have twenty typed questions along with ten recorded questions. These questions must be at the elementary level so they are able to be answered by the adults. However the questions cannot be too easy so they do not insult the intelligence of the adults. The tape recorder was tested and proved to be working correctly.
Future Work

Much work concerning the wheel will be concentrated in the following week. A visit to the hardware store and possibly the auto store is a must to gain recommendations on the mentioned primers. Further research must also be conducted on these primers. Once the appropriate primer is obtained the wheel must be painted as soon as possible. As soon as the wheel is painted the game can begin to be put together. Another visit to the machine shop will occur to speed up this occurrence. The motor problems will be looked into and a solution will be drawn upon. The questions and answers will be sent to Dr. Hallowell to make sure they are appropriate.

Project Review

Overall this week proved to be productive in the thought process of the game. There was a slight delay due to the change in plans of the wheel. However time will be made up for when the inside wheel does not have to be constructed. The next few weeks will conclude the construction and allow for testing to occur. This will put us back on track for the overall project.

Hours Worked
10 hours