This was a very productive week for our team. At the week’s completion, our built devices resemble the CAD drawings we initially made to a large extent. The standing gardener finally took shape, and the attachment of the front castors to the wheelchair frame has been started.

Concerning the standing gardener, the remaining feet have been successfully welded onto the pipes and tubes which will be used as the legs of the standing gardener. A total of 16 feet were welded onto 8 thin pipes and 8 thicker tubes. However, due to the limited thickness of the steel which the feet were made from, warping and bubbling occurred during the welding process. Figure 1 shows a warped and bubbled foot after it has been welded to one of the pipes.

![Figure 1 – Warped and bubbled foot after it has been welded to a pipe.](image)

To correct the problem, each of the feet was placed in a vice, and individually hammered so that it would straighten out into the correct form. Each foot had to be repeatedly removed from the vice, aligned once again, and hammered multiple times until a suitable shape was achieved.
Afterwards, the top of each foot was smoothened with the use of a disk grinder to remove any bubbles that have formed during welding.

In addition, a miller needed to be used to make slots within the top steel plate so that adjustable pot tray holding supports can be installed. For a clearer understanding of what is being discussed, please refer to Figure 2 where the slots are outlined with red.

![Figure 2 – Slots which needed to be milled](image)

This actually proved to be a much more challenging task than it initially appeared to be. Given the size of the plate, it was very difficult to position it correctly in the miller so that it would be straight and level during the milling process. Furthermore, as a result of the fact that only 15/1000 of an inch could be taken out of the top stainless steel plate during a single run, and the fact that the miller could only travel in each direction at a rate of about 1 inch per minute, multiple time consuming runs were required to actually get all the way through the plate in the indicated locations. In addition, oil needed to be frequently applied so the bit would not be damaged during the process. After the task was completed, the two indicated slots were milled.
into the steel plate with a width of 5/8 of an inch. Figure 3 shows the milling process as well as the completed slots.

![Figure 3 – Milling process and completed 5/8” thick slots.](image)

After the milling was completed, the legs were placed on top of the bottom plate, and the top plate was placed onto the legs in order to get a visual representation of the structure which is shown in Figure 4.

![Figure 4 – Visual representation of the structure of the standing gardener.](image)
The most important future work for the standing gardener is attaching the two plates to the feet which are welded to the supportive legs. To accomplish this, the plates will first need to be placed in proper position so that they align with each other. Furthermore, the legs will also need to be placed in the proper position so that the feet as well as the holes for telescoping face the proper direction. Once the two plates are steadily connected, the design of pad attachment as well as making the actual pads can be started.

Concerning the multi-terrain wheelchair, the attachment of the front castors has been started. Since the front wheels that are going to be attached are much larger than the front wheels which were initially attached to the wheelchair frame, the two front wheels will rub against each other during turning if the original site of attachment is used. For this reason, the frame needs to be modified so that it can support the width of the new wheels. The original castors fit into a vertical slot with a diameter of 1.125 inches. For this reason, the process of lathing 2 rods with a 2 inch diameter down to 1.125 inches has been started. Once this is completed, it will be possible to place the two rods inside the original castor housing, and attach an extension which will accommodate the width of the caster and the wheels which are to be installed.

Future work for the multi-terrain wheelchair consists of finishing the lathing process, attaching the required extension, and finally attaching the front thick-wheel castors. Once this is completed, it will be possible to start attaching the back wheels since the height at which they will need to be positioned will be known.

My work for this week focused on the standing gardener. Particularly, it mainly consisted of milling out the slots as indicated in Figure 3. The total number of hours I have worked this week is roughly equal to 14.5