Summary

Our class project was to build an automated aquaponics system. In order to do this, we first needed an enclosed area for the plants and fish. We used a steel frame shelf, because it needed to be able to hold the weight of the fish tank. Next plywood covered with Mylar sheeting was attached to cover all but one side of the shelf. The remaining side was covered by a flap of Mylar, which could be lifted to access the aquaponics system.

Next we adjusted the pH level of the fish tank, and goldfish were added and allowed to adjust to the water. The tomato seeds were planted in nursing trays and given time to grow. Once leaves started to show, we transported the plants into a substrates containing clay pebbles. Then pumps were set up, to allow water flow between the substrate and fish tank.

Beneficial bacteria in the fish tank converted the harmful ammonia found in fish waste into nitrates. These nitrates are an excellent food source for the plants and relatively harmless to the fish. The water and nitrates were then pumped into the substrate containing the plants. The plants filtered the water and absorbed the nutrients they needed. The now clean water was then pumped back down to the fish tank below. This cycle continuously repeated.

During this process, the aquaponics system monitored and maintained a controlled environment. The variables it monitored included temperature, lighting, and humidity. The only variable we had to monitor was the pH level. These variables were kept within a specified range, which benefited both plants and fish.

At this point, the fish are healthy and the plants have had time to grow, but fruit has not yet set. However, this system should prove to be highly productive in both crop yield and fish health.