In the morning on Friday we had our hands on training with the mice. We learned how to properly hold the mouse so it was restrained. We learned how to inject the mice and the correct protocol around the animal facility. While we were waiting on Friday for the evaluation board we decided to continue practicing removing teeth from the mice. With the new tools we were able to take the teeth from the maxilla out rather quickly and easily. The mandible continued to give us issues. We got the first tooth out without much of a struggle, but the second and third teeth proved to be more difficult. With a lot of patience they came out, but the twisting motion might have been too much for a live mouse.

This week we received the evaluation board from National Semiconductor. We quickly tested it out by giving it a 9V input and grounding the appropriate leads and using a multimeter to check it Fig 1. We recorded a 40V output.

Fig 1. 40 V output recorded by the multimeter
After that we connect the output to a resistor and MOSFET in series. The resistor was first as to allow a smaller voltage to drive the MOSFET gate. A function generator was used for the driving signal. The circuit set up can be seen in Fig 2. To make sure the MOSFET was working we placed a probe after the resistor and before the MOSFET the reading can be seen in Fig 3.

Fig 2. Evaluation Board Connected to the Resistor and MOSFET
On Tuesday we tested the board with the ultrasound transducer in place of the resistor. We put a probe in the same place as when we tested it with the resistor and to make sure the MOSFET was working. We then placed the transducer in water and checked the ultrasound propagation with the hydrophone. The reading from the oscilloscope and the multimeter showed that we were getting 33V with .126 A across the transducer Fig 4. This gave us a power output of about 5 W, which is more than enough. The purple graph shows the signal after it has passed through the transducer and the yellow shows the ultrasound signal through the water.
Fig 4. Ultrasound signal (electrical and acoustic)

Next thing to do is get the microcontroller working and plan out the circuit board. Once we get that ordered we can pick out a box and finish the project.

Hours worked: 11 hours