https://www.youtube.com/watch?v=aqfyRUVSq9I&t=1s

“Op-Amp Golden Rules and Designing an Active Filter” gave a great overview of the math behind filters. He explained Op-Amps well starting from a basic circuit he made a follower and non-inverting amplifier make sense. Then he explained the meaning behind non-inverting Op-Amps. Each time he added one component to the circuit at a time while explaining the change that occurred at each instance which made it much easier to understand the more complex circuits. He also describes how to discriminate between high and low frequencies to create high/ low pass filters using a capacitor. He explains the reason behind the 3dB point very well. At the end, he shows a physical circuit to show how the potentiometer impacts the waveform. This video helped with the implementation of a high pass and low pass filter that could be used in phase two for our speaker.

https://www.youtube.com/watch?v=FNG9f2qJdWk

This video shows a simple circuit that includes a proximity sensor that could be added to the speaker for use. We looked at this option when deciding on the design of our speaker. This could be used to increase volume using proximity or to turn the speaker on and off.

https://www.youtube.com/watch?v=3dQjIeYoIdM

The video described the MOSFET Audio Amplifier as a class D amp that has high efficiency. The MOSFET has low power loss, but it is not very strong. In the video he does the math to solve the cutoff frequency and capacitance needed for the circuit. This math is an important part of phase two that will help when doing the report for our speaker. My only problems with this video were that It's a bit hard to follow the circuit construction and it was confusing when he added the LM386 to the circuit to increase sound level but didn’t show how he did this. This video helped me decide not to use the MOSFET as the sound quality and noise were not good enough for our speakers to choose.

https://www.youtube.com/watch?v=P4GsoMTv-SY&t=105s

This video shows an LM386 audio amplifier to make it perform the best it can. When exploring options for which amplifier we wanted to use we watched this video to see if the LM386 was a viable option. In the video he shows the schematic, circuit layout, the build, testing, and all results. He doesn’t show the process of building the circuit so it’s a little hard to follow along. Shows sine wave output from the circuit and shows how different setups affect the wave. Explains how to get rid of clipping by adjusting the signal output and how including a capacitor can improve the amount of signal output you can have without clipping. I was surprised to see

that the LM386 had little distortion output on the waveform. We decided against this as it's not as strong as other amplifier options.

https://www.youtube.com/watch?v=iKZ05QIN8mc&t=476s

To help decide which amplifier I should use I watched “TDA2050 vs LM1875 Performance Tests to See Which Is the Best.” This video compares the LM1875 and the TDA2050. Each chip has good audio quality and low distortion. He shows the power measurement at different voltages and shows that the TDA2050 outputs more power than the LM1875 at the same supply voltage. He does many other tests comparing the two chips including the frequency response test, step response tests with different capacitor values, Inner module distortion and harmonic distortion. At the end of his video he summarizes all of his findings. The video finding better power output and less distortion helped us to decide we should use a TDA2050.

https://www.youtube.com/watch?v=mcAMNsmT6uE&t=1s

https://www.youtube.com/watch?v=cggDZE7gZNw

After I decided to use the TDA2050 for the tweeter and the TDA2030 for the subwoofer, I watched two videos on circuit construction of amplifiers using the TDA2030. Each of these videos provides in-depth step by step process on how to set up an amplifier using TDA2030. These videos are extremely helpful for when I am constructing the speaker circuit as I can easily follow along with the videos to create my own speaker.