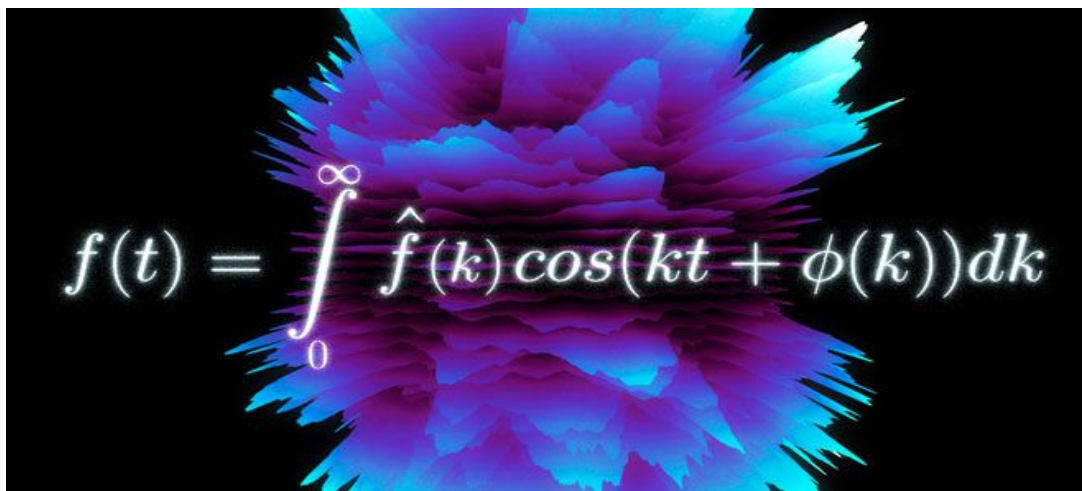


**2a)** The computing innovation that is represented by my computational artifact are noise cancelling headphones. The use of noise cancelling headphones makes listening to music better for your ears because you don't need to raise the volume so high to hear just your music. The cancellation of an outside noise makes you hear just hear the music and nothing else. With normal headphones you would have to higher up the volume to hear what you're listening to if the outside noise is loud. They can also be used as a sleeping aid. Another way they can be used is in the aviation like helicopters.

**2b)** To create my artifact i used google drawings. What i did was i gathered pictures that related to my research. I gathered a lot of information about noise cancelling headphones, how it works, what does it do, and how it benefits people. I put the steps on how noise cancelling headphones function then a put a background and laid out all my pictures and information on how it works between the images.

**2c)** One great beneficial impact noise cancelling headphones is that it provides an excellent hearing protection against outside external noises. You get a better noise attenuation and the noise cancellation works on all external noise not just low frequency continuous droning sound. One bad impact noise cancelling headphones have is that they are not cheap due to the manufacturing it takes to make them.

**2d)** noise cancelling headphones use the formula:


$$f(t) = \int_0^{\infty} \hat{f}(k) \cos(kt + \phi(k)) dk$$

To break external noise into simple waves, then emit identical waves to wipe out the unwanted waves.

2e) <https://www.computerworld.com/article/2538811/mobile-wireless/review-5-noise-canceling-headphones-keep-things-quiet.html>

[https://www.wired.com/2011/05/st\\_equation\\_noisecanceled/](https://www.wired.com/2011/05/st_equation_noisecanceled/)

<https://www.online-sciences.com/technology/the-advantages-and-disadvantages-of-noise-cancelling-headphones/>