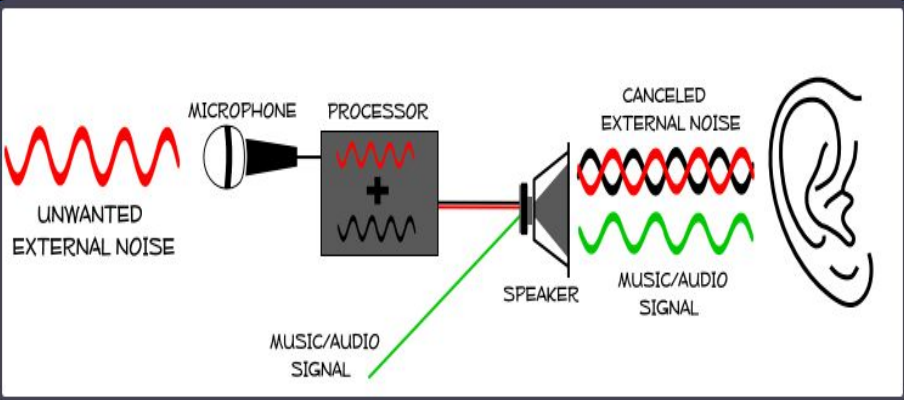


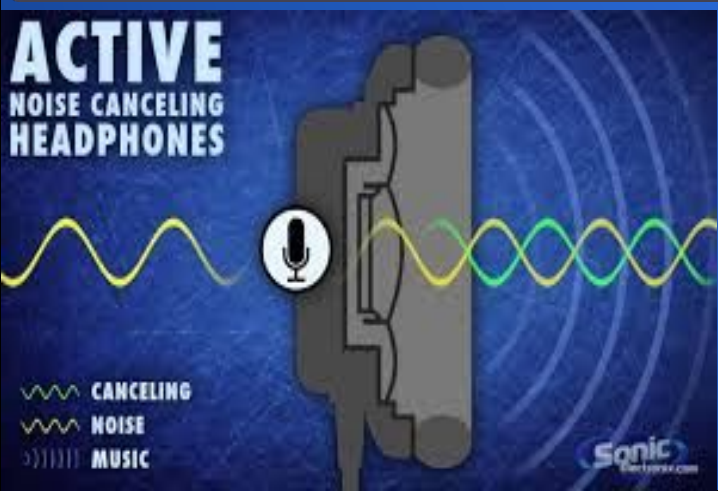
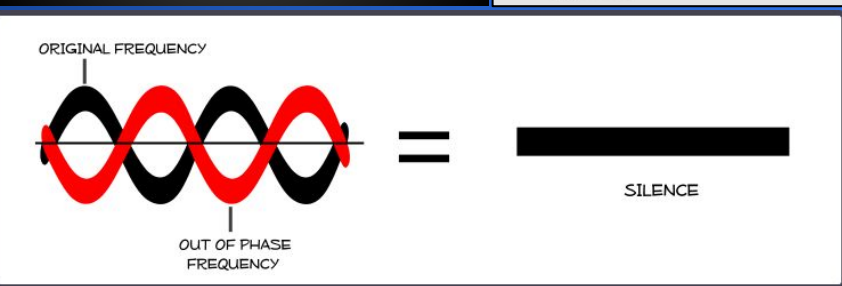
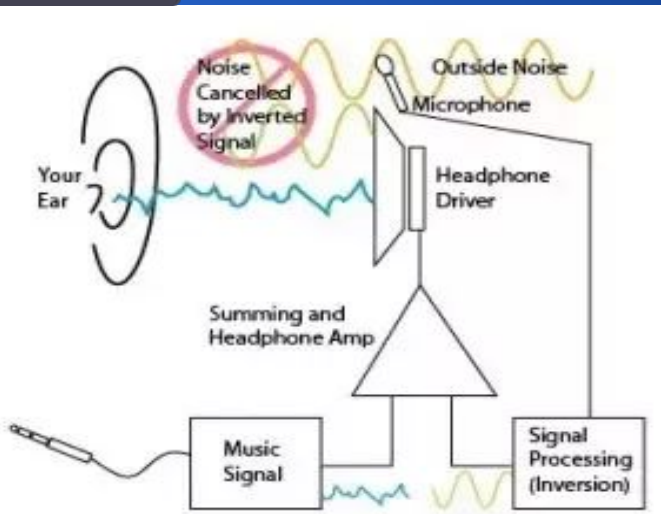
Step 1: First an outside noise travels toward the headphone

Step 3: The noise cancellation circuitry inverts wave and send it back to the headphones speaker

Step 4: Finally the original outside sound and the new waveform created by the noise cancellation circuitry cancel each other out only letting the music signal through



Step 2: Next the outside noise gets picked up by a microphone and is sent to the noise cancellation circuitry inside the headphone



An abstract visualization of sound waves as a dense, colorful, spiky cloud. Overlaid on this is the mathematical equation:
$$f(t) = \int_0^{\infty} \hat{f}(k) \cos(kt + \phi(k)) dk$$

