Antibiotic resistance has caused at least 700,000 deaths due to resistant bacteria. The human populations that are most vulnerable to AMR are low-income, high poverty populations where antibiotics are used more often. An example is India, where most antibiotics are brought without a prescription and more common diseases are highly contagious and caused by bacteria rather than, say, cancerous cells. Additionally, low-income populations working in the US in high antibiotic levels are also susceptible to resistant bacteria. Two sources of antibiotic resistant bacteria include livestock, where antibiotics in the livestock feed prompt the rise of more resistant bacteria, which are in turn transferred to humans. Another source is contaminated water; many water sources contain antibiotics in them from pharmaceutical waste, which leads to resistant bacteria being created in the water and then being drunk by humans. Antibiotics such as penicillin target cell wall and inhibit cell wall synthesis, causing the cell to collapse and die. Other antibiotics like tetracyclines target protein synthesis, which prohibits the cell from replicating.

The sample I will be analyzing is soil from the woods I live next to. I will be investigating whether this sample contains any antibiotic resistant bacteria, and how I can correlate the location and conditions of soil to the amount of antibiotic-resistant bacteria present inside it.