**Problem Solving Through Engineering & Design**

**Problem Statement:** Due to the impacts of COVID-19 and future disease outbreak events, many companies are reimagining how to keep the spaces and products used by their clients safe. How can we develop and optimize an effective sanitization system so that it is human and environmentally friendly, sustainable, cost-effective, and can be applied to a variety of enclosed spaces.

**Task:** Your team is being asked to develop an idea or design for optimizing an effective sanitation system that meets the outlined criteria below. Your team is free to develop your idea for a specific location or environment of your choosing.

You are encouraged to think about your interests and where those interests take place, or places that you frequent. You may want consider places that you have not gone to since the start of the pandemic due to their lack of safety. For example, perhaps you are interested in applying this idea to an indoor gym or exercise facility. Another example could be for public restrooms.

**Criteria:** The idea or design that you develop should address the following items.

1. **Effective sanitation** – how will you know the cleaning is effective and the area of interest is indeed clean and sanitized? What percent of bacteria or germs will be eradicated and how will you verify this?
2. **Human and living organism friendly** – how will you know that your method for effective sanitation will be safe for humans yet powerful enough to combat viruses such as COVID-19?
3. **Environmentally friendly** – we want to ensure that the methods developed are not harmful to the environment. We want to have close to no pollution or toxic waste produced.
4. **Sustainability** – your method for effective sanitation should use materials that are renewable and have a low impact on the environment.
5. **Cost-effective** – the production of your product should be sustainable.
6. **Versatility** – your developed method should be usable for various locations and spaces.
7. **Creative and Unique** – your sanitation system should be original and creative.

**End Product:** your developed idea must be presented in a visual form. The visual should include labels that identify and describe the purpose/function of the different parts of the sanitation system. The visual representation can be a refined drawing of your sanitation system as well as a physical protype that is accompanied by a visual showing labels and the purpose/functions.

**Presentation:** your team will have two weeks to develop the sanitizing system that meets the criteria. At the end of this unit lesson, you will present your system to a group of judges that will score and critique your product based on a rubric. The teams with the highest scores will go on to present their systems alongside students from other classes and grades.