Science Department
Summer Project

Mr. Alster
Dr. Bridges
Mrs. Butler
Dr. Curtis
Mrs. Lyons-Woods
Mrs. Newell
Ms. Phillips
Dr. Unger

The purpose of this project is to challenge you to think like a scientist / innovator and design a project that addresses a multitude of topics.

Directions:

1. Find the problem you are going to solve by matching the first initial of your last name to the problem according to the table below. For example, Mr. **A**lster works on Natural vs. Acquired Immunity while Dr. **U**nger works on designing an ecosystem in a jar.
    a. It does not matter what science class you are taking, all of the teachers in the department are doing the same summer project.
2. Use the following document to go through the Engineering Design Process (Define the problem, research, brainstorm, prototype, test and evaluate, share).
3. Record all responses on this document.
4. Make sure you cite your sources and put everything in **YOUR OWN WORDS**.

Due Dates:

The following must be turned into your teacher on the specified due date.

Date Due	What is Due?
September 7, 2021 First Day of School	Define the Problem, Research, Brainstorm, Prototype (sketches & description)
September 13, 2021 First Monday of School	Prototype (build), test & evaluate, share.

LIST OF TOPICS

First Letter of Last Name	Problem	Instructions
A-D	Natural vs. Acquired Immunity	Design a model to identify the differences between natural and acquired immunity. Use the Covid-19 vaccine as an example.
E-H	Design a Launcher	Design a type of launcher that launches a marble as far as possible.
I-L	Design a Bridge	Design a bridge made out of printer paper, paper clips, tape, and straws that self-propel a toy-car 1 meter over a gap.
M-P	Design a Roller Coaster	Design a roller coaster out of printer paper, straws, paper clips, tape that allows a marble to complete the coaster.
Q-S	Design a Water Filtration System	Design a method to purify water. For example, how can you separate oil when it mixes with water.
T-V	Design an Ecosystem in a Jar	Design their own ecosystem in a jar to identify the interconnectedness between biotic and abiotic factors. Ecosystem in a Jar | NSTA
W-Z	Composting	Composting is a way to decompose material. Your task is to design a method for the composting of organic material as quickly as possible.

Define the Problem

In this step of the Engineering Design Process, you are solidifying what the problem you are trying to solve is. You need to be as specific as possible and include as much detail. It should be clear what you are trying to solve.

What is the problem you are trying to solve? Use as much detail as possible and be specific.

What are your limitations? In other words, what restrictions are placed upon you?

Research the Problem

In this step of the Engineering Design Process you will research information about the science behind the problem, ways it has already been solved, and what could be further improved. As you research, be sure to cite the source you used and write what you read in the note's sections. We recommend going to 4 different sources to find information.

Citation	Your Notes

Ideate (Brainstorm)

In this step of the Engineering Design Process, you will create a list of ways you can solve this problem. Remember, there is no idea that is too silly or weak. Write down EVERYTHING that comes to mind. When we come to school in September, you will work with a group and then analyze each of your ideas to figure out the best one. In order to have the BEST idea, we need AS MANY AS POSSIBLE.

My possible solutions are:

Make / Prototype

This is the section of the Engineering Design Process where we actually make you solution. This part of the process is divided up into 3 sections, sketches, descriptions, and a physical product. Sketches should be fully labelled with dimensions (if applicable). Written descriptions should include what materials you need and a summary of how you will assemble them.

SKETCH

Front View	Side View	Back View

WRITTEN DESCRIPTION
In the space below, write a description of the materials you will use to construct your solution and how you will assemble them to make your product.

PHYSICAL PRODUCT
Upload a picture of your physical product. Be sure to label the diagram, including dimensions (if applicable)

Test / Evaluate

In this step of the Engineering Design Process, you will be testing your product and evaluating its effectiveness. Nothing will work perfectly on the first try, so this is your time to see what is working and what can be improved. Use the chart below to organize your thoughts. REMEMBER, include everything. After each test re-evaluate and record.

Test Number	What Works Well	What Needs to Be Changed	How We Will Improve

Share

In this section of the Engineering Design Process you will be sharing out your project along with information about testing.

For this project, you will share out your solution with either a Tik Tok, YouTube video, commercial, etc. Be creative. You must include the following:

1. What you are trying to solve.
2. The final product – show it working.
3. Information about how you came to this final design.
4. Next steps you would take if you had more time.