

**RoverPoint Lesson Slides
Created by Michael Byson**

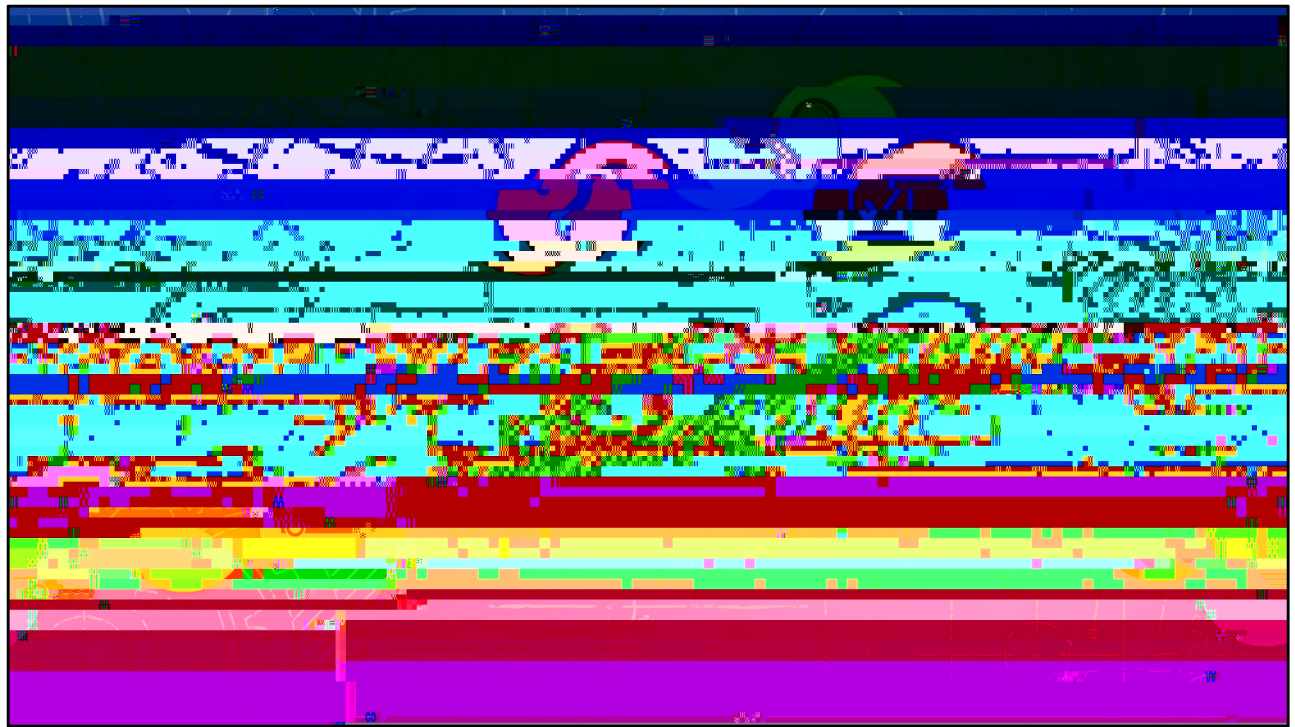
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**Andeys University SIEM Division
January 2022**

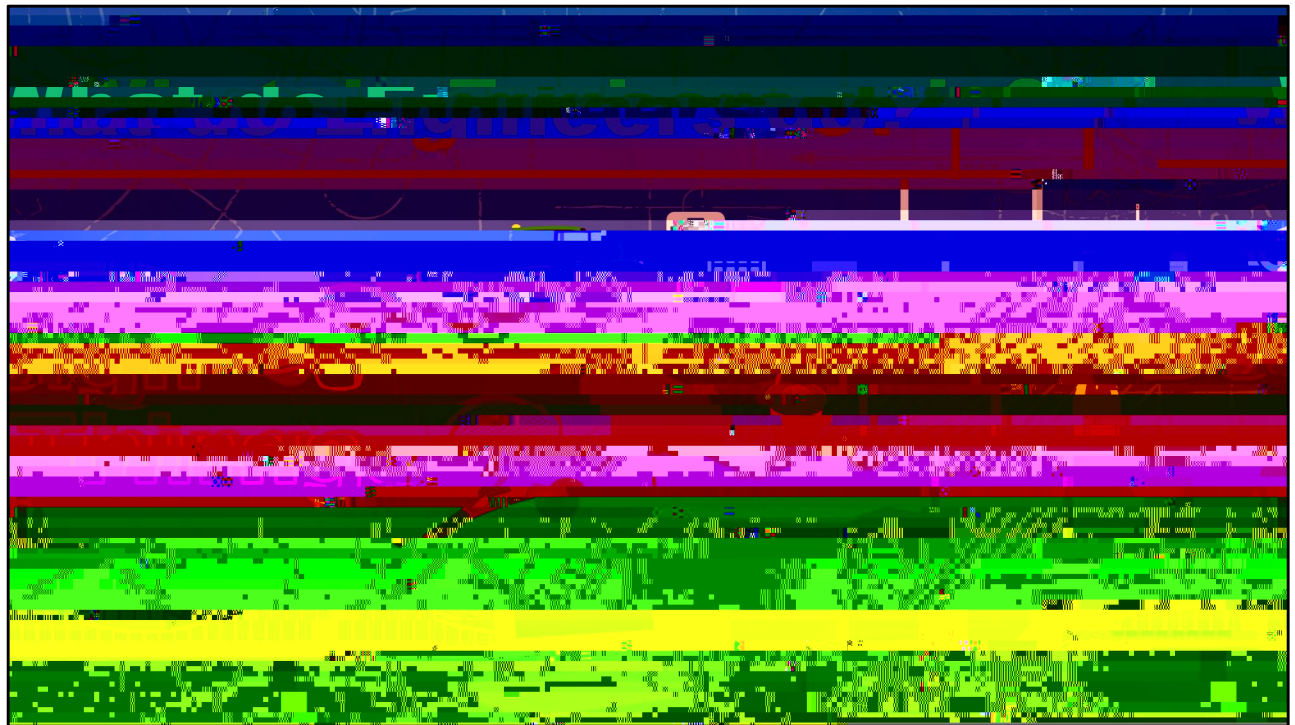
Note

Some slides in the RoverPoint have text or images that appear out of place until full screen playback. This is because some elements are animated and will not appear in the right place until the slide is played. There are also some animated transitions that require an extra slide to animate properly. These slides were simplified for the notes version to improve readability.

Page numbers in this document do not correspond to slide numbers in the RoverPoint.

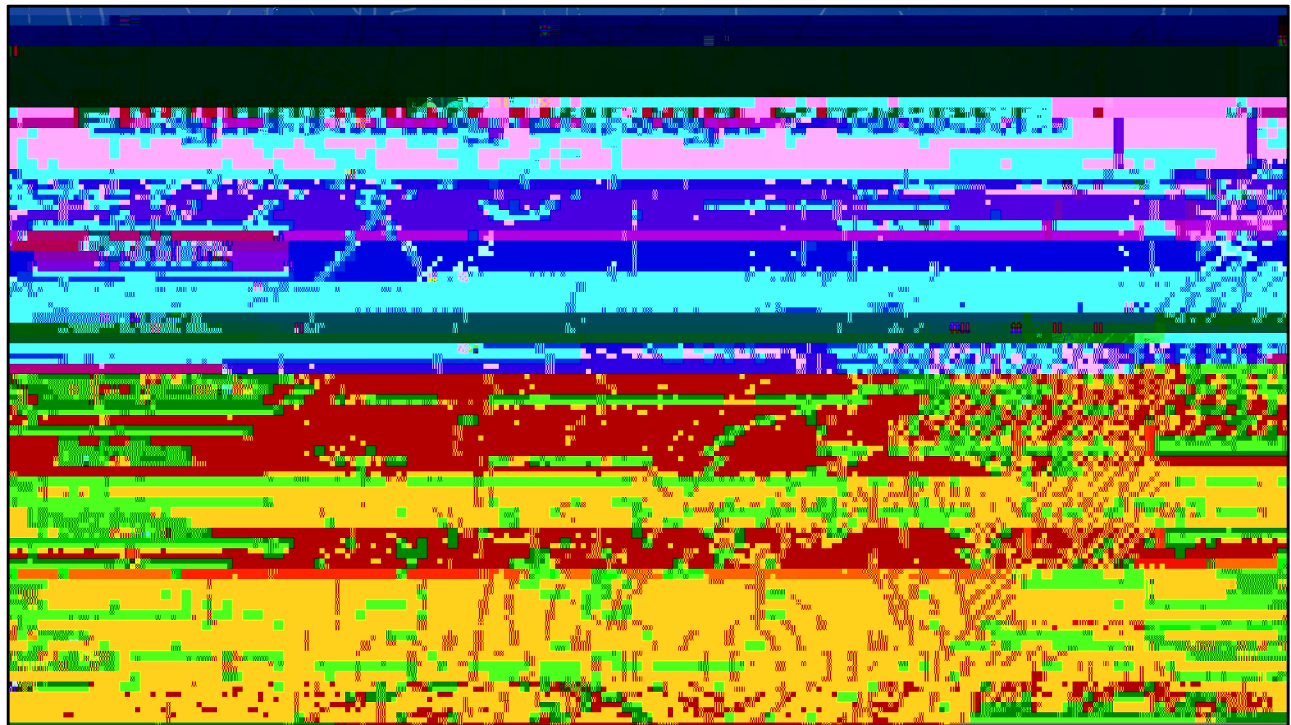


Lesson 3 What Is Engineering?



What do Engineers do?

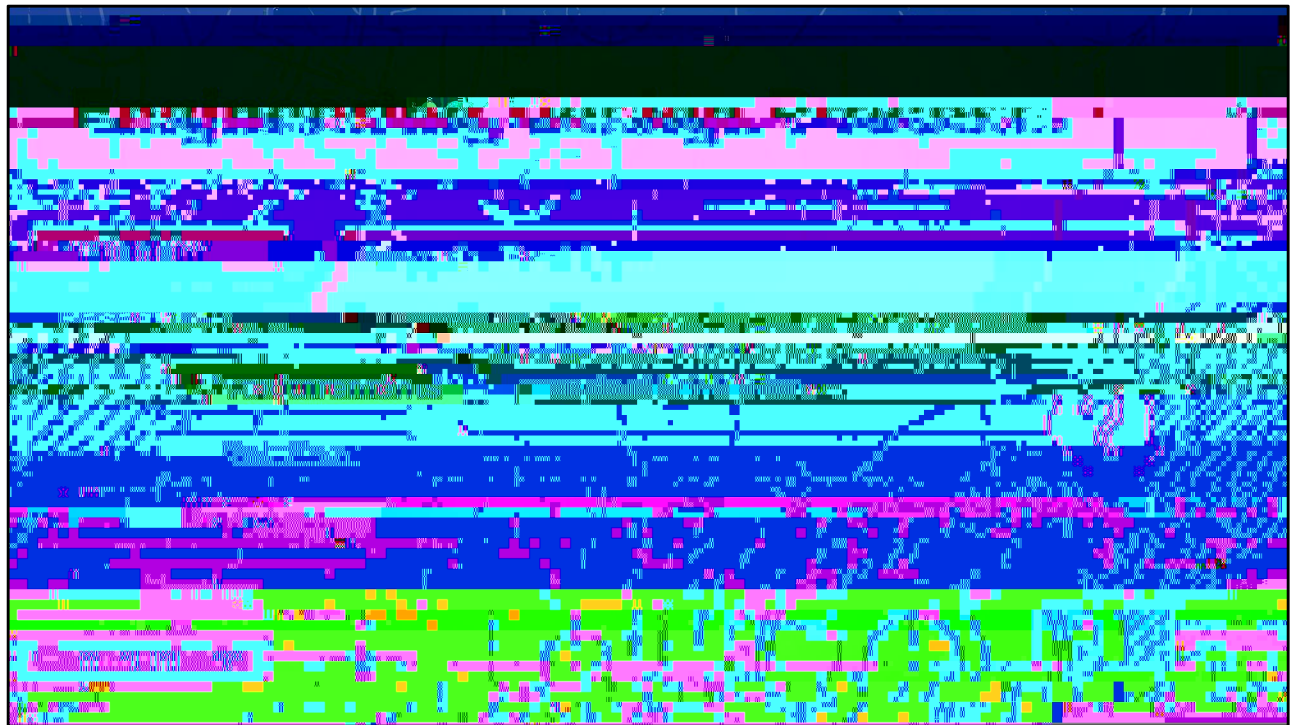
Engineers design things to solve problems- computers, bridges, rockets, toasters, drink cups, and more



How do engineers solve problems?

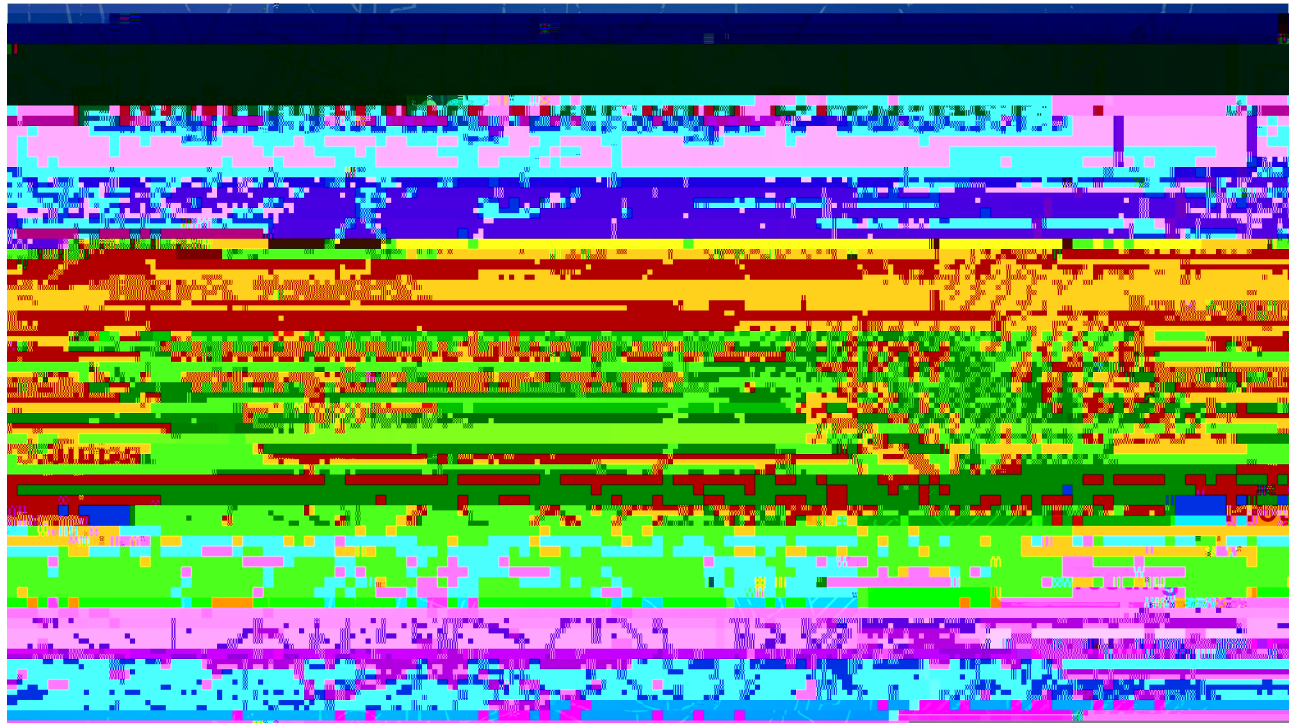
They follow the engineering design process. These systematic steps allow them to design solutions to real-world problems.

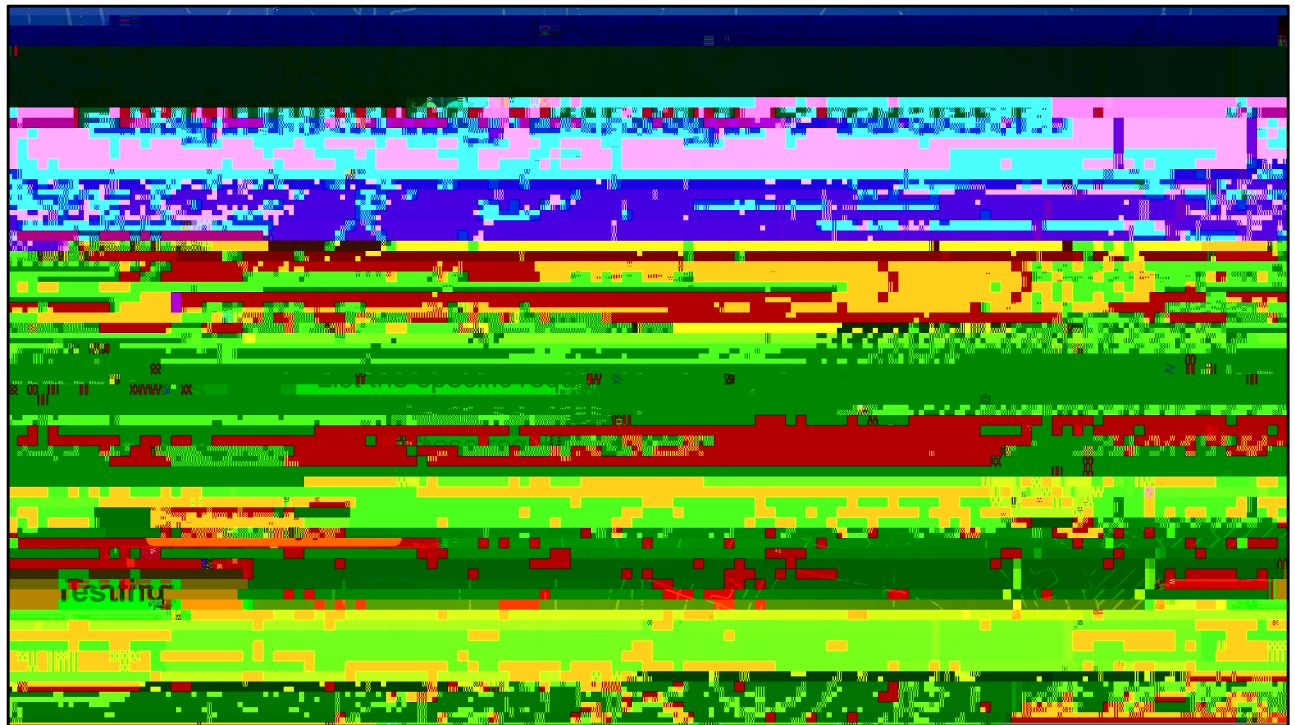
This process will help students solve real-world problems.

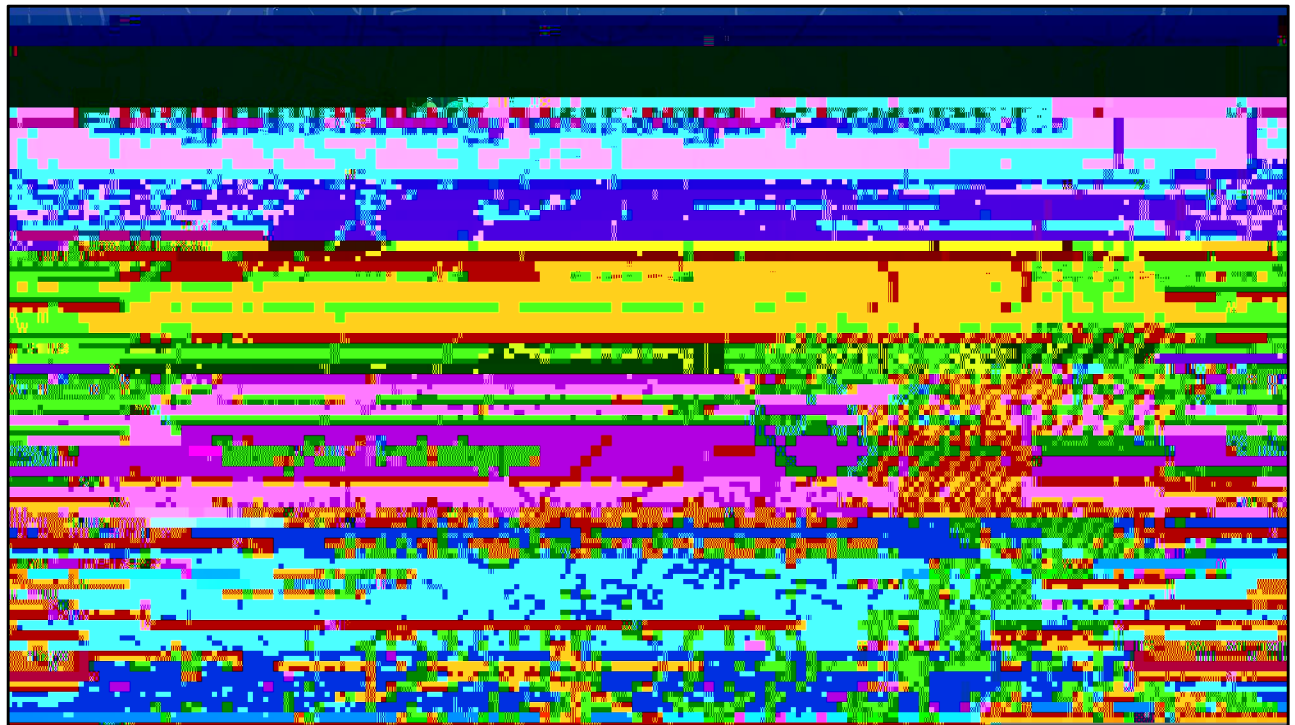


Step 1: Problem

Find a problem by observing the world around you
Define (describe) the problem in detail

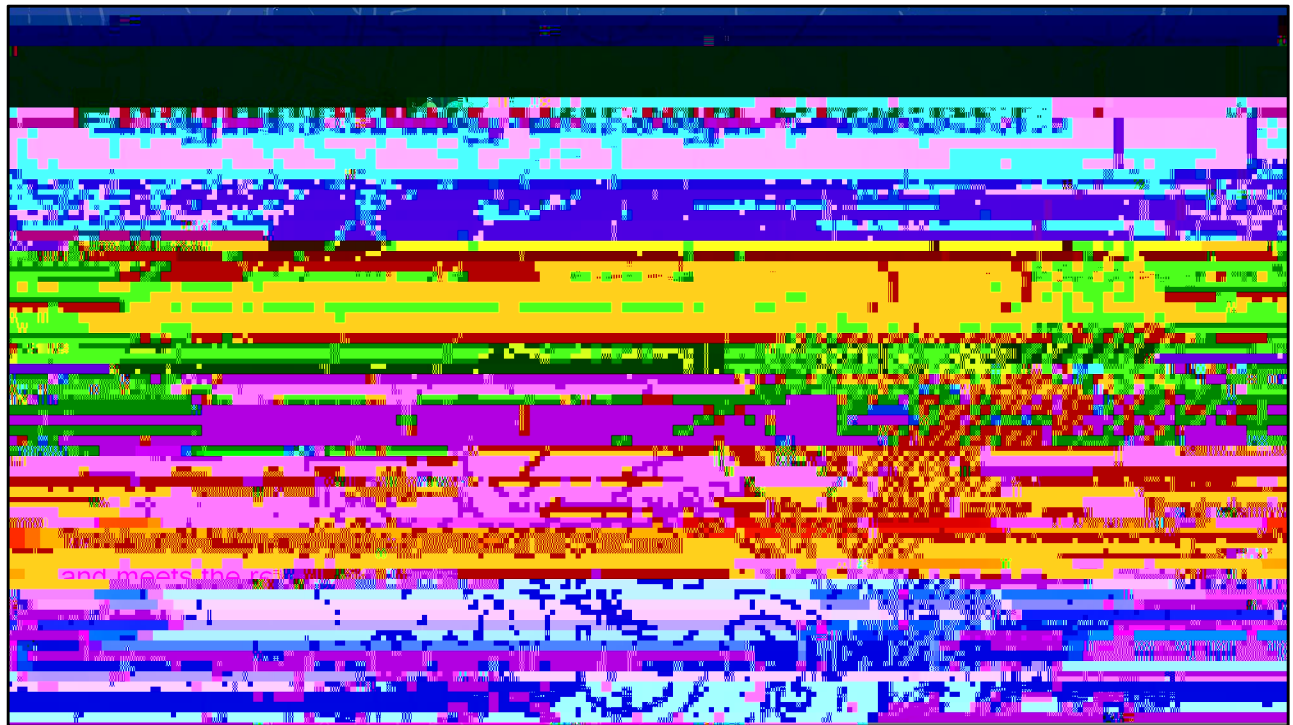






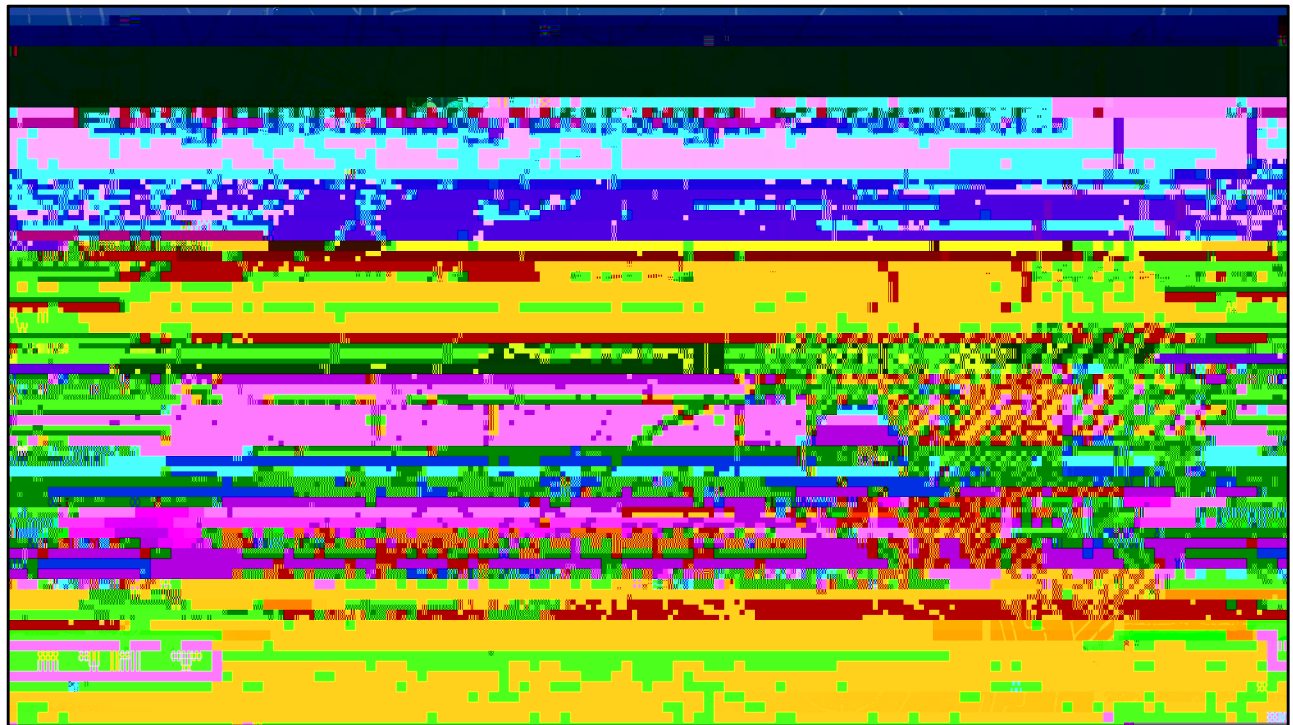
Step5 Prototype

Design and build a prototype (model) of the solution you chose



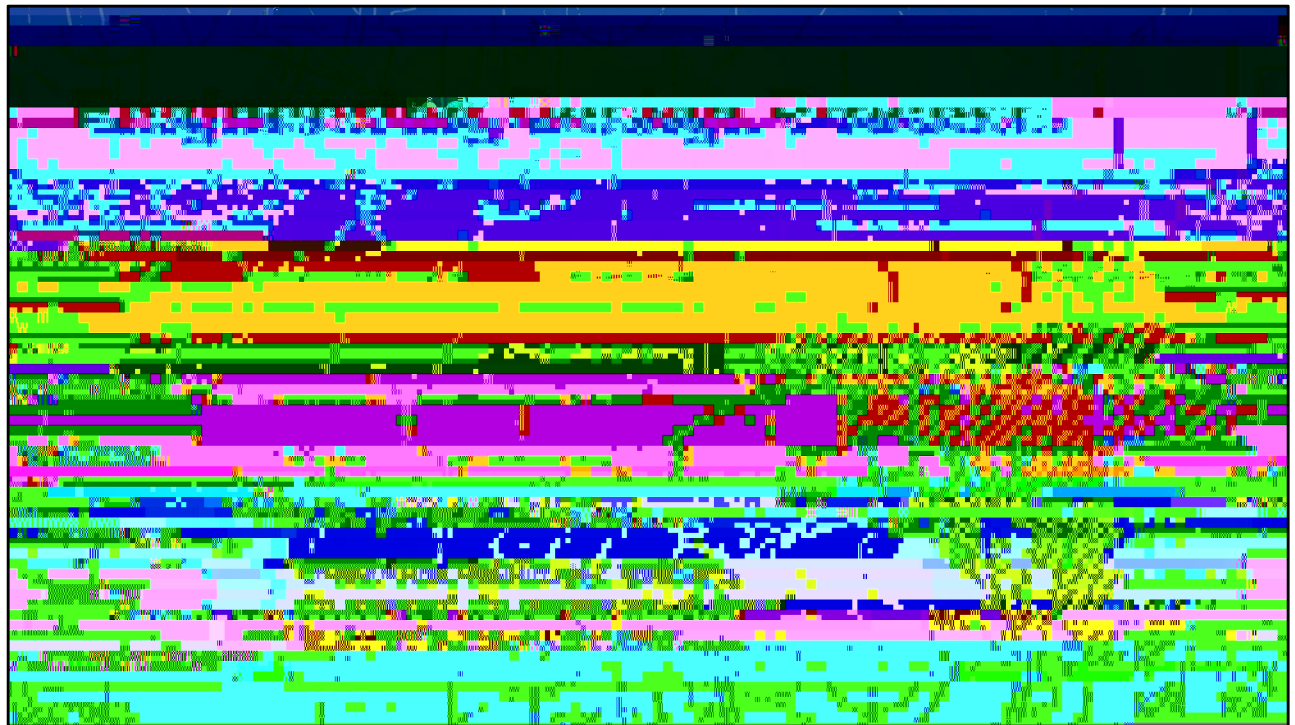
Step 6 Testing

Test the prototype to see how well it works



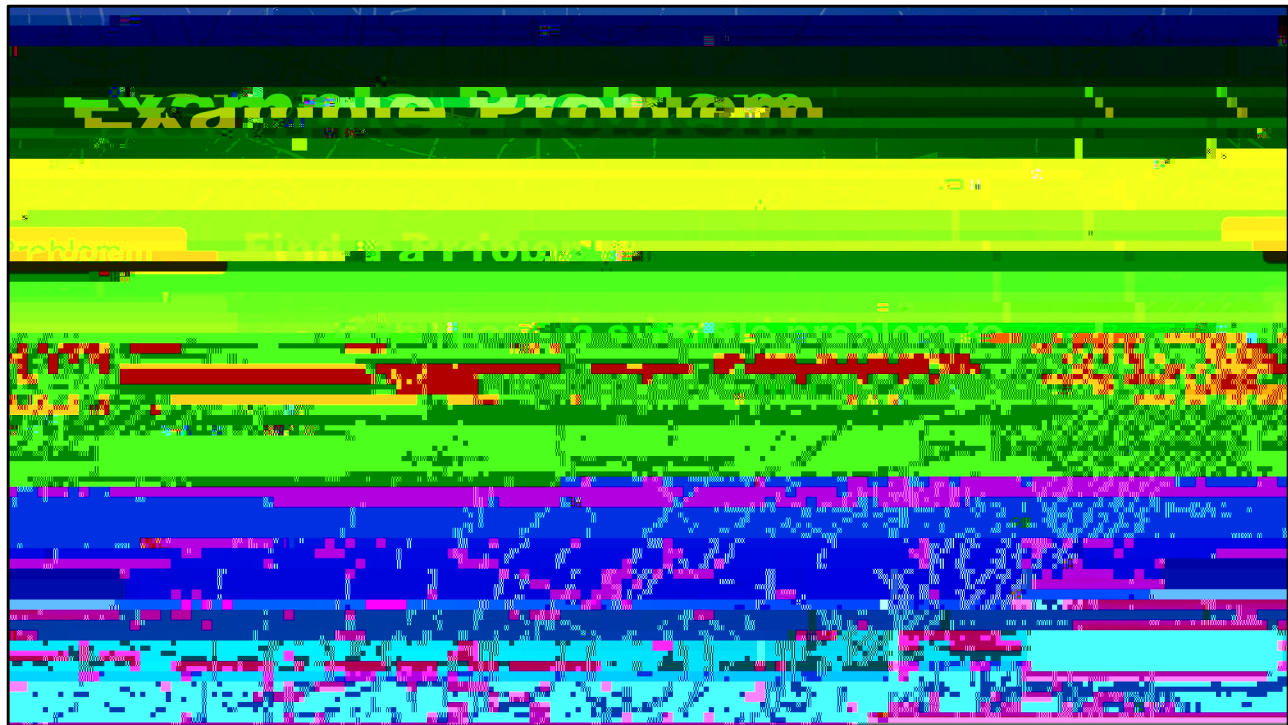
Step 6 Testing (& Iteration)

Test the prototype to see how well it works. Return to previous steps and make



Step 7: Communicate

Tell others what you accomplished. Show them the final result and explain the steps you took.



Example Problem

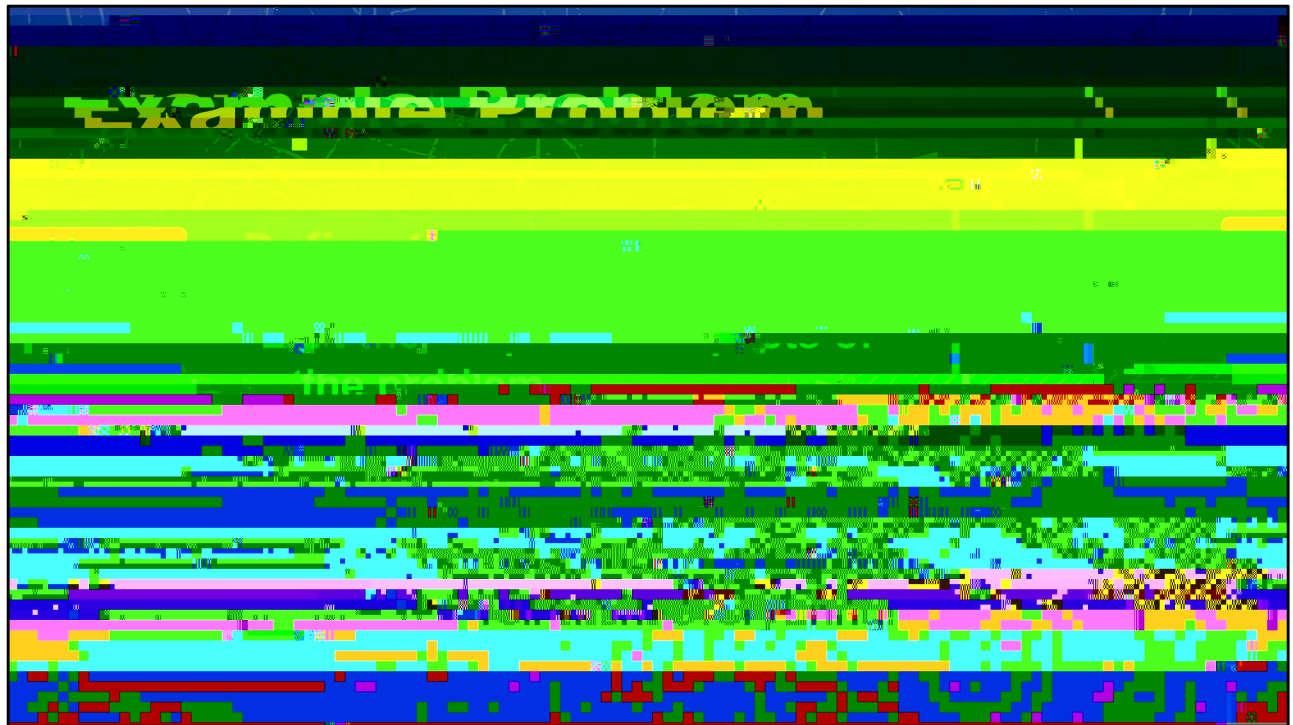
This activity should be completed together as a class. Let the students think for themselves and discuss together as you guide the process. This is an opportunity for them to practice the engineering design process before doing it with their own problem. You will not be doing the entire design process with this example (only the first 4 steps). As you progress through the example, write and draw on the board.

Find a Problem

Choose a simple example to solve with the class.

You can find Example Problems on our website (Activities section in Teacher Resources) or choose your own.

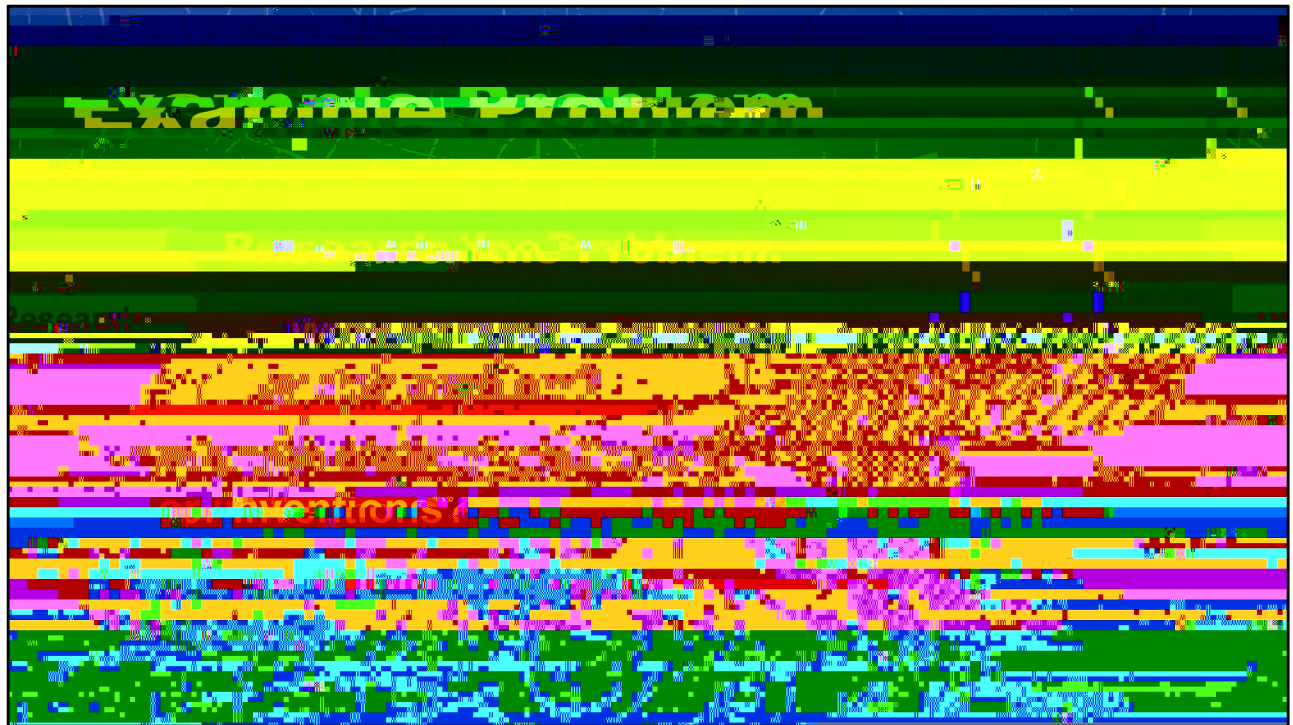
https://www.andrews.edu/cas/stem/finert/downloads/example_problems_9_12.pdf



Define the Problem

Describe the problem in detail

List anything that might be important to know when looking for a solution

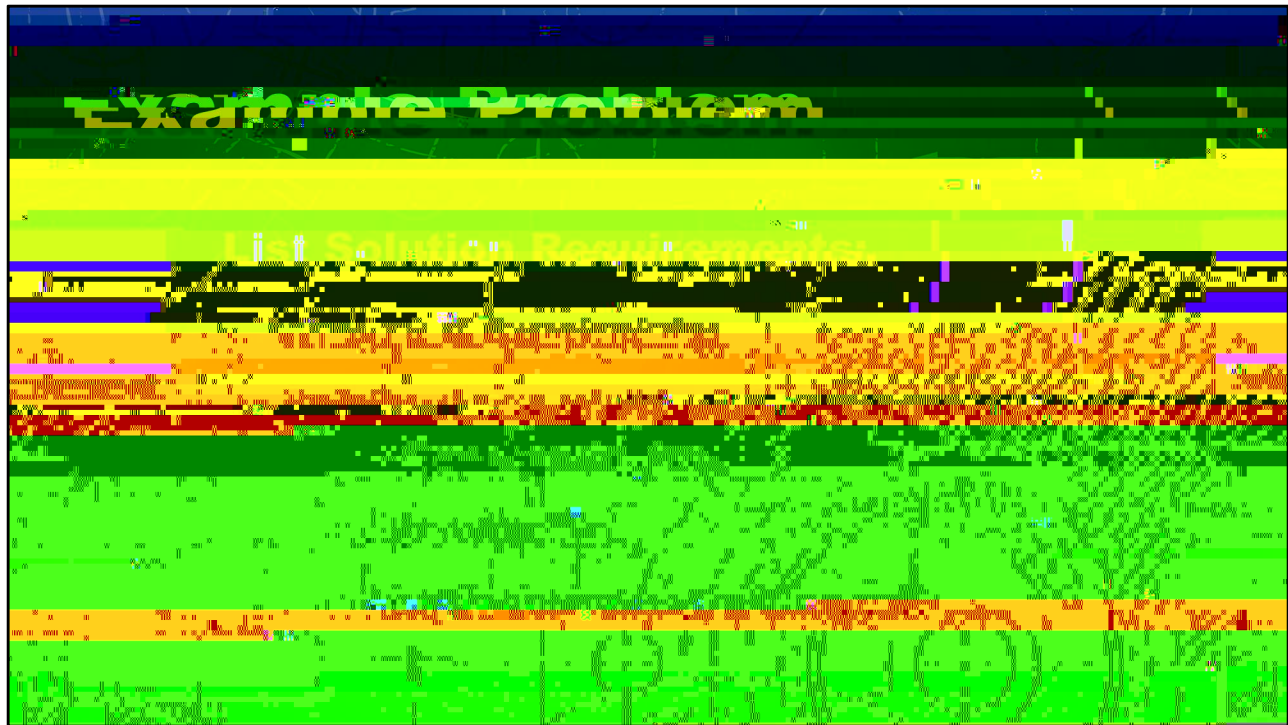


Research the Problem

Consider the questions for the chosen problem

To save time, this step can be simplified or skipped for the example

Students will go more in depth when doing it for their own problem



List Solution Requirements

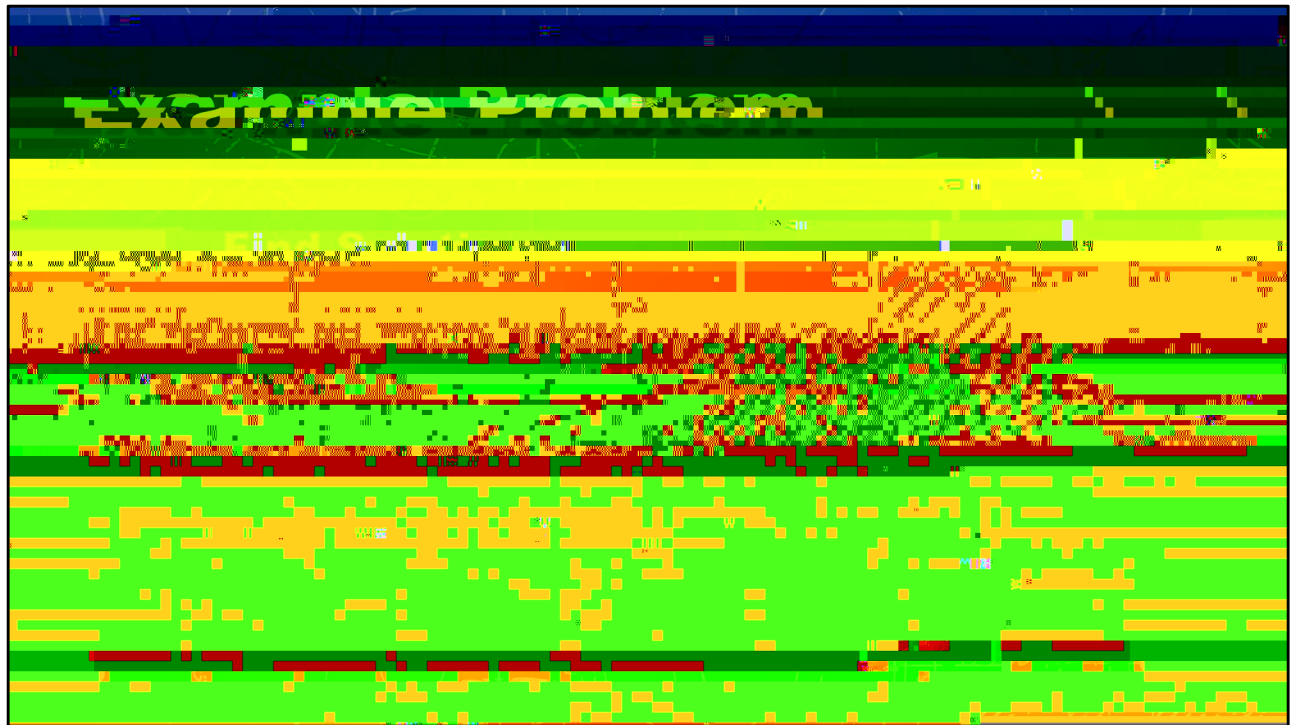
Write the requirements on the board

Criteria– things the solution must meet or do

Constraints– things the solution must not do (limitations or restrictions for the design)

Consider the requirements for the solution without choosing a specific solution yet.

The requirements will be the checklist for the invention



Find Solutions

Write/draw the solutions on the board

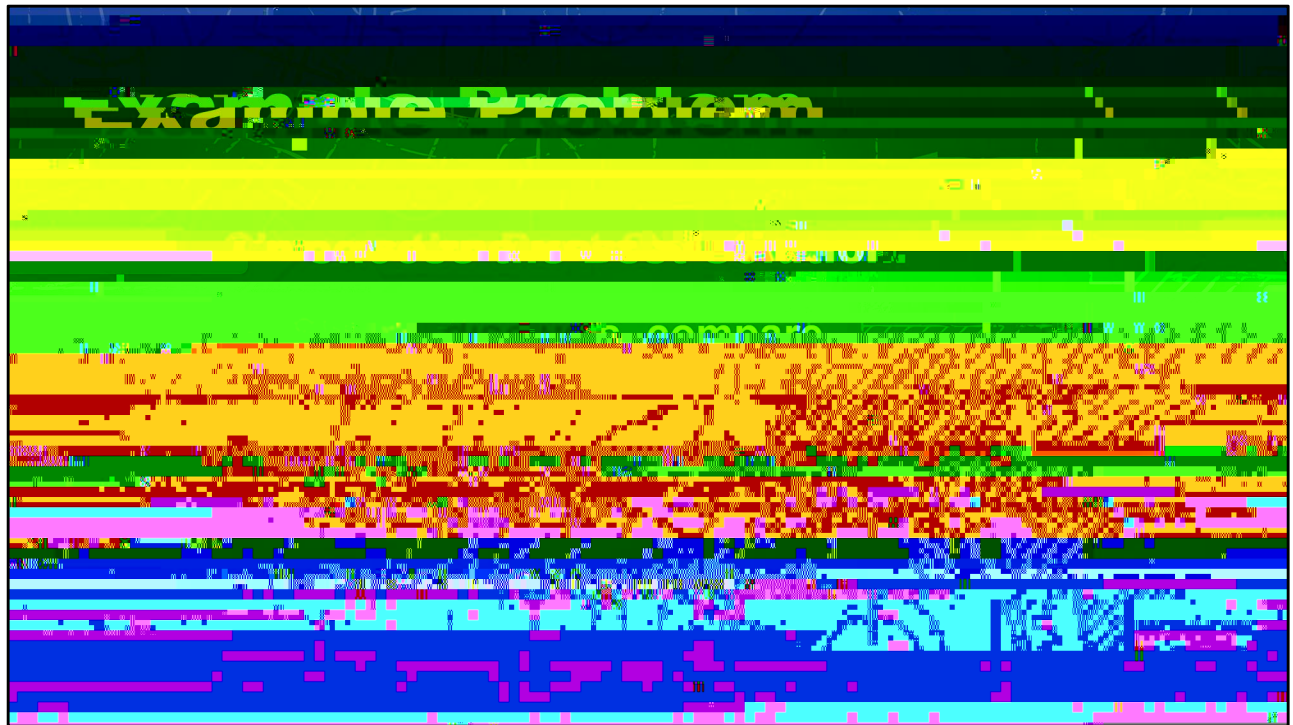
Let students think of and draw solutions on their own or in groups

Have the students share with the class

Think of as many ideas as possible

Even bad ideas may spark an idea in someone else

Ideally, consider solutions you can make

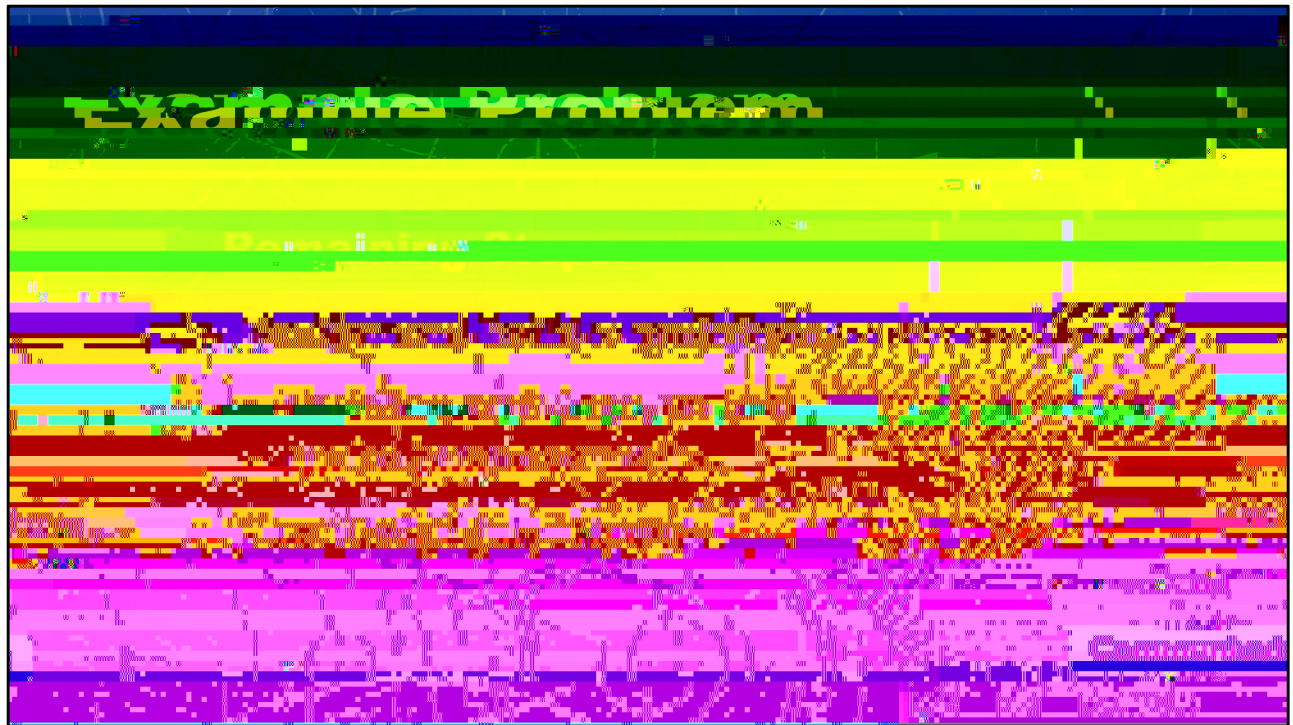


Choose the Best Solution

Discuss as a class or in small groups

Choose the solution that best meets the requirements

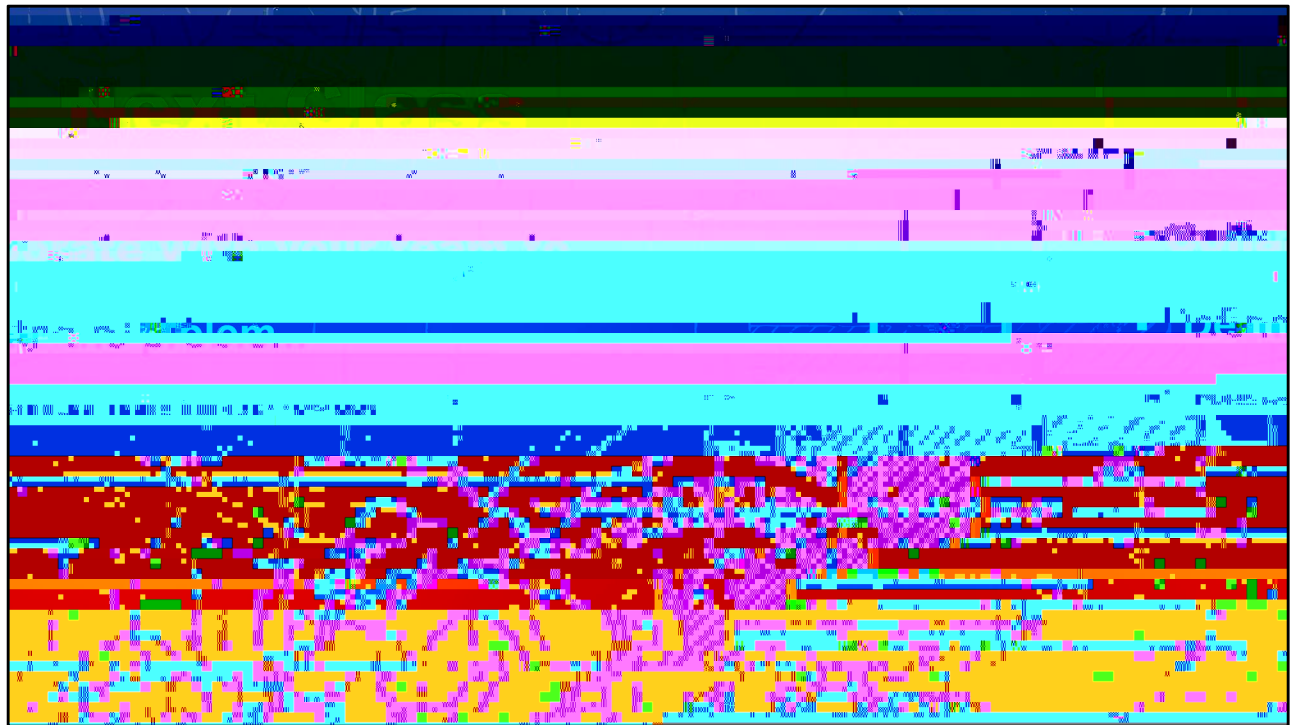
The solutions should be original or innovative (improve on existing inventions).



Remaining Steps

When students do this with their own project, they will then design, build, test, and improve their solution

At the end, they will prepare a presentation



Starting next time, the students will work on the project in their teams. They will follow the engineering design process and document their progress in the logbook (available on our website, Project Resources section in Teacher Resources).

