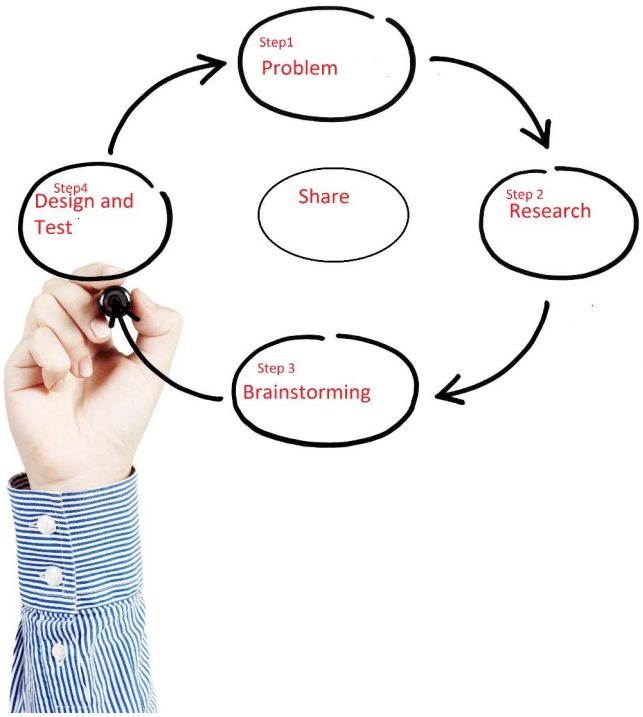
The Engineering Design Process



Rapid advances in technology require individuals in science, technology, engineering and mathematics careers to be skillful problem solvers when new problems arise. But what does it mean to be a good problem solver? Problem solving has been described as “knowing what to do when you don’t know what to do.” Good problem solvers break complex problems down into smaller, more manageable steps and they are patient and methodical, carefully considering all options before moving forward toward a solution..

Step 1-PROBLEM

The first step in problem solving is to clearly define and understand the problem. In order to do this, questions must be asked. Some questions will have answers, others may require further questioning/research. You need to identify what you do and do not know. From there, you can begin to seek out the knowledge and skills needed. Refer the ***problem video*** and/or ***script*** to assist you with this task.

Define the problem: _____

_____

_____

What are the criteria for a successful solution?	What do we know?	What do we need to find out? Be specific

Step 2-RESEARCH-Asking and Answering Questions

Once you know what you need to learn you must develop a plan to acquire that knowledge. Who will do what part of the research and how much time do you have to complete the research task?

Where will you find the information that you need?	How long do you have to complete your research?	Divide up the learning: Who will do what?

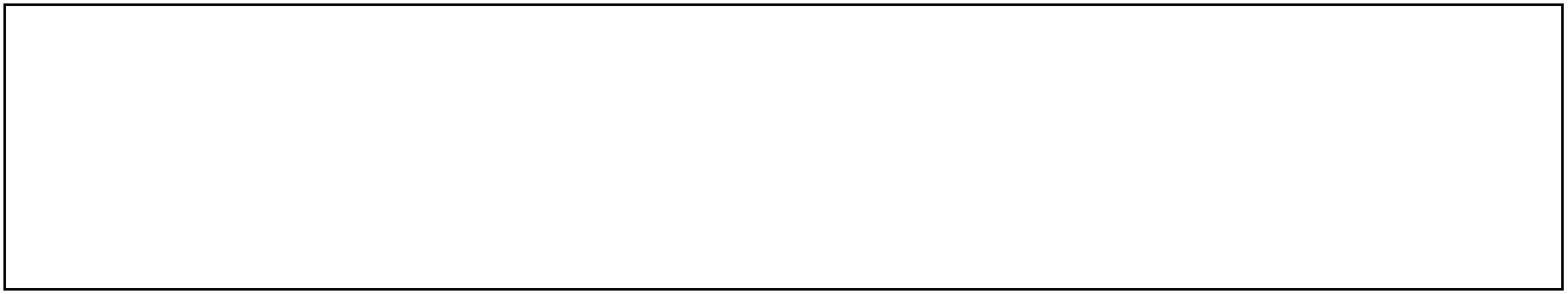
Step 3-BRAINSTORM

Brainstorm ideas. What could be some solutions? Identify pros/cons of each solution and use them to rank each solution by value.

Solution Ideas	Pros	Cons	Ranking

Step 4-TESTING Plan

Draw a diagram of your solution. Label it.



Step 4-TESTING Plan

Make a list of the materials you will need

List the steps you will take

Step 4-TEST and REFLECT

Part of the Engineering Design Process is to reflect on your solution. How does your solution meet the criteria to solve the problem?

Initial problem criteria	How does the solution address the criteria?

Step 5-SHARE

Share your solution with your peers. Gather their feedback, and using your own reflection, improve your design solution. Explain your improvements.

Feedback From Peers

Step 5-SHARE (continued)

Labeled Diagram of Your Improved Solution	Explain What Was Changed

Name :_____ Date:_____

PBL Checkpoints

As you finish each step of the PBL project please complete the checkpoint below. Use your work from the *White Boards* as a guide. Remember to write complete sentences!

Step 1: Problem
Describe the problem and what will is needed for a solution to be a success.

_____
_____
_____
_____
_____
_____

Step 2: Research
What specific information will you need to solve the problem and where can it be found?

_____
_____
_____
_____
_____

Step 3:Brainstorming
What ideas for solutions did you and your group come up with during your brainstorming session? How did you decide on the best possible solution?

_____

_____

_____

_____

_____

_____

_____

Step 4: Design and Test
Describe in detail how you would test your solution.

_____

_____

_____

_____

_____

_____

_____

Name:_____

Date:_____

PBL Vocabulary

*List the five vocabulary words that **your teache**r provides for you from the PBL Problem. Define each.*

1._____

_____:

2_____

_____:

3._____

_____:

4._____

_____:

5._____

_____:

Name:_____

Date:_____

PBL Vocabulary

*List five words of **your** choice to define based on the problem videos, resources and research. Define Below.*

1._____

_____:

2_____

_____:

3._____

_____:

4._____

_____:

5._____

_____: