Name _____

Engineering Problem Solving

The process by which engineers design and create is called *Engineering Problem Solving*. By going through this process step by step, engineers attack problems methodically to come up with a functioning solution that fits specifications. The steps of the Process are:

- 1. Identify the Problem
- 2. Define constraints
- 3. Brainstorm
- 4. Research Prior Art
- 5. Brainstorm
- 6. Pick the best solution
- 7. Design
- 8. Iterate (*do it again!*)

Math is also important in engineering! We just discussed pressure: P=Force/Area. Describe the relationship between Force, Area, and Pressure below by choosing a few numbers to plug into the formula. (What happens to pressure when force is bigger than area?)

Now it's your turn to be the engineer!

1. What is your problem?

2. What are your constraints? (write down two)

3. Write down or sketch three general ideas your group has to solve this problem.

- 4. Usually, engineers read books and other papers for their review of previously designed devices which are known as *prior art*. Instead you have two tasks:
 - a. As a group, think of other things you've learned in science class or in another class. What are two concepts you've learned already that might be important to consider in creating your device?

- b. Go to one other group and talk about their possible designs. What did you learn or what ideas did you gain from a different group?
- 5. Brainstorm again! Do you have any new ideas? Do you have any changes you want to make on your old designs? Write at least one new idea or change to an above design down here.

6. The design my team picked is:

- 7. Now it is time to BUILD!
- 8. What is one thing that would make this device better?