

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## **SCI 111 – Physical Science I**

### **Lab 3 - An Introduction to Engineering**

**Purpose** – To introduce the method engineers use to solve a problem.

#### **Description of Engineering Challenge** –

There are a number of challenges that can be used to demonstrate the engineering design process. For this lesson students are asked to build a freestanding bridge that spans a one foot gap. The materials to be used are toothpicks and candy. Students are given a choice of three candies to use for their building material (Candy “Dots”, Gumdrops (small), and marshmallows (large ones))

To be considered a “passing” bridge, the bridge must hold a matchbox car for ten seconds.

I didn’t limit how much material they could use, so they start out with a full box/bag of the chosen material. I may limit this in the future.

Round toothpicks are stronger so it is recommended that these be used instead of flat ones.

#### **Assignment** –

- 1) Follow each set of instructions as given
- 2) Use the provided blank sheets to plan YOUR solution(s) to the problem presented
- 3) Fill in Table 1 and describe how you used the steps of the Engineering Method to solve the presented problem
- 4) When completed, turn in your filled in Table 1, the sheet(s) with your solution to the problem, and your completed result questions (Typed, spell-checked, 12 pt. font)

#### **Result Questions** –

- 1) How easy or hard was it to solve the presented problem? What made it so easy or hard to solve?
- 2) Compare and contrast the five steps of the engineering method and the five steps of the scientific method. Do you see any link between these two methods?
- 3) How similar were your plans with your partners? Were there any common themes/patterns/ideas shared?

Step in the Engineering Process -	What did you do to complete this step?
Ask	
Imagine	
Plan	
Create	
Improve	

Table 1 – Engineering Process Steps

## Solution Page



## **Steps for the lab –**

- 1) Introduce the problem
- 2) Have students write down their questions
- 3) Answer any questions
- 4) Give students 5 minutes to plan one or more solutions to the problem
  - a. Each student must come up with their own plan(s) individually, not as a group.
- 5) Divide students into groups of 2
- 6) Give groups fifteen minutes to work on the proposed solution
- 7) Allow groups to test their solution at that point.
- 8) Give another twenty minutes to complete/improve their solution
- 9) Test again