



December 8, 2014  
 6<sup>th</sup> Grade Scientists  
 Forestbrook Middle School  
 4430 Gator Lane  
 Myrtle Beach, SC, 29588

Dear 6<sup>th</sup> Grade Scientists,

Our company is in need of a team of **technological design engineers** to create the newest, coolest balloon-powered vehicle that we can place on the market just in time for Christmas. The idea is to create a light-weight, easy to assemble toy vehicle that can roll for a long distance. We need your help to assemble a team consisting of: a project engineer, facilities engineer, a test design engineer. The project responsibilities for each team member are described below.

Project Engineer Name:_____	Safety Engineer Name:_____	Facilities Engineer Name:_____	Test Engineer Name:_____
Helping members understand the team's task	Monitoring safety	Collecting materials	Testing, recording and organizing data in the design log
Leading team discussions	Directing clean up	Directing model construction	Quality Control: Ensuring that all of the questions, diagrams, and reflections in the design log are completed in a neat and thorough fashion.
Checking to make sure the task is complete	Storing materials		

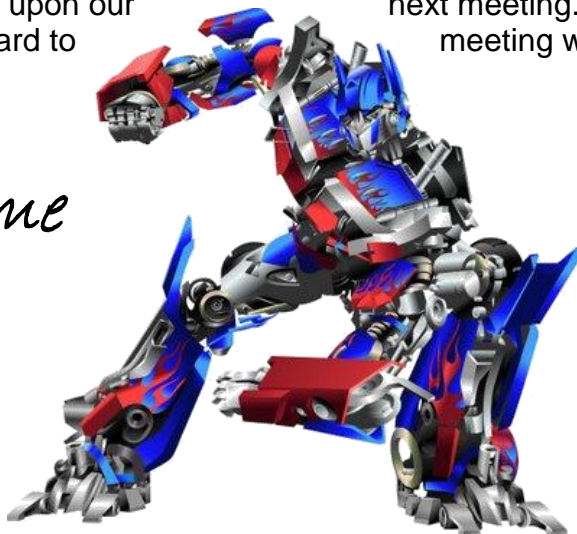
The materials needed to complete a design model for a balloon-powered toy vehicle include: **Scotch tape, one balloon, \*skewers, \*straws, \*cardboard, paper plates, one gallon size and one sandwich size Ziploc bag, Sharpie, and scissors. \*3 or less of the materials listed above.**

We are depending on you and your colleagues to engineer a design for the next hottest toy for this year! It is important that you test the design to ensure the product's quality, and have it ready in a timely fashion so that we can market your product. Enclosed in the packet are the forms that must be submitted along with your design upon our next meeting. Thank you in advance for your hard work and we look forward to meeting with you soon.

Regards,

*Optimus R. Prime*

Optimus R. Prime  
 Toy Tech President





## **PART 1: UNDERSTANDING TECHNOLOGICAL DESIGN**

What do shovels, cell phones, heart monitors, and even toys all have in common? They are inventions created to make our lives easier and/or better. See, people invent things to solve our problems. The process of designing objects or processes for our benefit is called **technological design**. This is a four-step process.

We need your expert team of technological toy designers to go through this process in order to effectively create the... next... HOTTEST TOY!



**Step 1: PROBLEM IDENTIFICATION:** Restate your goal.

What kind of toy vehicle do we want to manufacture? \_\_\_\_\_

**Step 2: SOLUTION DESIGN:** Here we have to create designs to solve our problem.

Draw 2 designs in the spaces below using the materials in the above picture.

**A**

**B**

What are the trade-offs (advantages and disadvantages) of both model designs?

MODEL A		MODEL B	
Advantages	Disadvantages	Advantages	Disadvantages



### **Step 3: IMPLEMENTATION:**

Now it's time to construct and test your model vehicle! Fill in the table below.

Model A				Model B			
Mass:				Mass:			
Trials (Distance Traveled)				Trials (Distance Traveled)			
1	2	3	Average	1	2	3	Average
Describe motion path: (circle one) Straight    Curved    Crazy!				Describe motion path: (circle one) Straight    Curved    Crazy!			

**Step 4: EVALUATION:** Here is where you decide which model design will solve our problem and/or if the product will be the hottest toy that parents will be scrambling to the toy store to purchase for their children for Christmas.

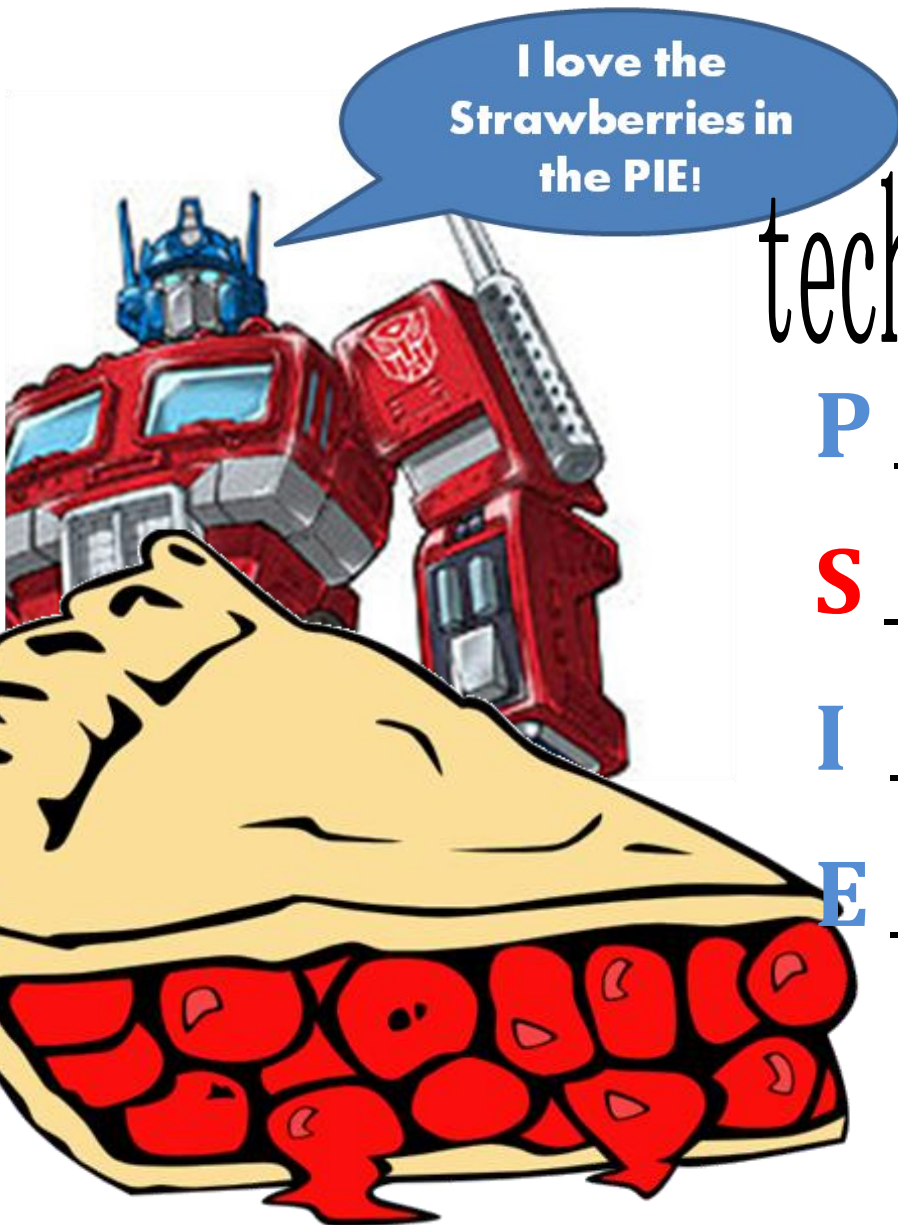
What are the positive and negative attributes (trade-offs) of your balloon-powered vehicle compared to the other team's designs?

How can you improve your balloon-powered vehicle for the future?

Positive Trade-Offs	Negative Trade-Offs



**Complete** and **Keep** in your notebook should have to design another product (and/or study for a test).



# technological design

**P** \_\_\_\_\_

**S** \_\_\_\_\_

**I** \_\_\_\_\_

**E** \_\_\_\_\_

In the space provided, explain how we use "Strawberries in the PIE" to help us to remember the steps of technological design?