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**Constructing Parachutes**

Over the past few weeks you have learned about the Engineering Design Process and have put phases of it into practice. Today you will use the entire process as you **ask** questions, **imagine** solutions, **plan** designs, **create** your product and **improve** upon it.

*Scenario: You are a team of engineers who have been given the challenge to design a parachute out of everyday items. Your challenge is to design a parachute that can carry one plastic toy soldier to the ground from a height of 2 meters and hit a 10 centimeter target with the slowest possible rate of descent. The parachute can hit the target with the slowest descent rate is the winner.*

**Understanding the Science: Gravity and Air Resistance**

*Before you can construct your parachute, you need to understand how gravity and air resistance work. From watching the video and reading the article, describe your understanding of the constraints you will be under as you design and construct your parachute.*

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**ASK – What is the GOAL of your project? What constraints/limitations are you under?**

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**IMAGINE – Brainstorm some ideas of how you can reach your goal.**

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**PLAN– What are some possible designs for your parachute? What materials will you use?***Meet as a team and discuss the goal and the constraints. Develop and agree on the design for your parachute. You’ll need to agree on the materials you will use. Draw your design below. Be sure to indicate the description and number of parts you plan to use.*

**CREATE and IMPROVE– How will you construct your parachute?***Build you parachute. During construction you may decide you need additional materials or that your design needs to change. If this is the case, just make a new sketch and revise you materials list.*

**TEST– How did your parachute perform?**

*Each team will test their parachute. You’ll need time to time your test to make sure your parachute can support your toy soldier and achieve the slowest rate of descent. Your teacher will drop your parachute and you will use a stopwatch to record the drop time. In addition, you will measure the distance from the landed target for each of the 4 tests. After your tests are completed, you will calculate the velocity of teach test and then calculate the average of drop height, drop time, velocity and distance landed from target. Use the table below to record your data and then enter the data in iSense.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parachute Testing Data** | | | | |
|  | **Drop Height (meters)** | **Drop Time (seconds)** | **Velocity (meters/second)** | **Distance Landed from Target** |
| **Test 1** |  |  |  |  |
| **Test 2** |  |  |  |  |
| **Test 3** |  |  |  |  |
| **Test4** |  |  |  |  |
| **Average** |  |  |  |  |

**EVALUATE – What did you learn?**

*Evaluate your teams’ results, and present your findings to the class. After looking at the class data, as presented through iSense, complete the Evaluation Worksheet.*