**Moving Outward**

**Design Challenge**

**Challenge:**

Consider how a seed is dispersed away from the host tree as it falls to the ground. Working as a member of an engineering design team, construct a device that will transport a seed (represented by a ping-pong ball) as far as possible outward from a central drop point after being dropped from a given height.

**Hint:** The object is to build a device that will move a seed (ping pong ball) outward from the central drop point. The completed device will be released by a teacher. Therefore, you must make certain that the completed device is not dependent upon your team’s assistance.

**Limitations -** Your team must adhere to the following design parameters:

1. You must work in teams to solve the design problem in the time allotted;
2. Provide sketches or drawings that illustrate the engineering design process was used during the challenge;
3. Use no more than 10 credits to purchase the materials needed to construct the device;
4. The seed (ping pong ball) must remain intact and undamaged during the fall.

During the final testing, you will have three opportunities to test the device. The greatest distance will be recorded as your result. The first point of contact with the ground will serve as the distance recorded.

**Evaluation:** Individual scores are based on points accumulated using the criteria listed below:

* **Design Creativity:** Did the individual work with their team to provide evidence of brainstorming and consideration of the limitations above?
* **Descent Score:** Distance that the team’s device moved away from the central drop point
* **Quality:** The device was able to complete repetitive testing. Additionally, the overall product aesthetic quality will be evaluated.

**Ideation:**

|  |  |
| --- | --- |
|  |  |
|  |  |

**Final Design**

|  |
| --- |
|  |

**Teams will be provided with 10 credits. Teams may purchase and use any of the materials listed below to construct a solution to the problem—while not exceeding the 10-credit budget limit.**

**Tools (scissors, pencil) may be rented using the same credit system. As teams make decisions to purchase materials/rent tools, all purchases need to be recorded. Take care when making purchases and renting tools because once credits are used, teams won’t be re-credited.**

|  |  |  |
| --- | --- | --- |
|  | **Cost/Credits** | **Purchases/Rentals** |
| **Tools** |  | **Credits:** |
| Scissors | 1 Credit (rental fee) |  |
| Pencil | 1 Credit (rental fee) |  |
| **Materials** |  |  |
| 4 - Large rubber bands | 2 Credits |  |
| 1 - Paper cup | 2 Credits |  |
| 2 - Sheets 8-1/2” X 11” paper | 1 Credit |  |
| 1 - 24” Piece of masking tape | 1 Credit |  |
| 2 - Plastic drinking straws | 1 Credit |  |
| 2 – Sheets tissue paper | 1 Credit |  |
| 1 - 24” Length woven cotton string | 2 Credits |  |
| 1 - Ping pong ball | Free |  |
| **Total Credits Used:** | | |

**Note:** Tools may not be used as part of the final design. One 12-foot test stand, and a tape measure will be utilized for testing. Teams should return all undamaged materials and all rental tools at the conclusion of the challenge so that they may be recycled.

**Final Testing:**

**Attempt 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Attempt 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Attempt 3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**