**Popsicle Catapult Project**

Materials needed:

30 popsicle sticks

Hot glue

2 rubber bands

Plastic golf balls

Objective:

Launch 10 golf balls at plastic bin from 10 feet away. The goal is to score as many golf balls in the target as possible out of 10 attempts. The catapult must be free standing, and only one hand is allowed to touch the catapult to launch it.

Requirements:

1. Each team member will sketch their design on an 8 1/2” by 11” sheet of paper
   1. Show two views, dimensions, and include a key
2. Each team member will draw their design in Google Sketch-up
   1. Print out with dimension, add a key
3. The team members (2 per team) will discuss the design and then chose the design to build
4. The team will divide the work between the members and complete a prototype catapult
5. Launch the catapult ten times and record the number made. Post the number scored in the chart on the board.
6. Redesign the catapult making notes in your engineering notebook
7. Build a new catapult or revise the prototype
8. Launch the new catapult 10 more times and record the distances. Post the number scored in the chart on the board.
9. Each team member will then write a summary report with the following information:
   1. How did the prototype catapult perform against the others in the class?
   2. How did the revised catapult perform against your prototype and the others in class?
   3. What changes could be made to the catapult to improve its performance?
   4. How did the group divide the work, and how well did you work together? What you would do different if you were working in a group like this again?
   5. Explain Newton’s Three Laws and how each law applies to your catapult.
   6. The report should include a Microsoft word chart of the data for the prototype and final launch
   7. Notes made during the design process should be included in your notebook.

Grading:

1. The team will submit a complete notebook with the following items:
   1. A cover sheet with all team member names (10pts)
   2. A copy of each team member’s design (30 pts)
      1. Hand drawing
      2. Google drawing
   3. A summary report written by each team member (30pts)
2. The final Catapult will be judged against the others in the class (20 points)
   1. 5 points will be added to the grade of the top performer
   2. No deductions for 2-3rd place
   3. 4th – 6th place – deduct 5 points
   4. 7th – 9th place – deduct 10 points
   5. 10th – 12th place – deduct 15 points
   6. 13th place and above – deduct 20 points
3. Quality of construction (10 points)
   1. 5 points for correct amount of paper
   2. 5 points for appropriate amount of tape