You will be building a catapult using the attached design as a guideline. By building the catapult we will be learning about measurements and introducing us to motion, kinetic energy, potential energy, acceleration and velocity.

Make a materials list of everything you will need to build the catapult, be sure to include specific size pieces (quantity of each) and any angles that need to be cut.

(Wood, wood glue and brads will be supplied by Mr. S.)

While working in your group you should be looking and answering the following questions. Each of you will write a well-constructed paragraph for each question.

1. What was your group attempting to achieve with its catapult design?

2. How did the catapult set the marshmallow in motion?

3. Which challenge did your catapult meet best, accuracy or distance?

4. What could you have done to make the catapult better?

5. What helped the catapult work as well as it did?

6. What did this activity teach you about motion and forces?

Evaluation

Use the following three-point rubric to evaluate your groups' work during this lesson.

**Three points**: Students actively participated in class discussions; worked cooperatively in their teams; successfully created a team catapult; actively participated in the catapult launch; wrote a thoughtful **paragraph that answered all six questions.**

**Two points**: Students somewhat participated in class discussions; worked somewhat cooperatively in their teams; needed help to complete their catapult; did not actively participate in the catapult launch; wrote an incomplete paragraph that answered only three or four of the six questions.

**One point**: Students somewhat participated in class discussions; were unable to use catapult materials without teacher guidance; created unfinished catapults; did not actively participate in the catapult launch; wrote an incomplete paragraph that answered only one or two of the questions.

**Vocabulary : define each term and write a sentence using it in proper contexts**

Acceleration

Force

Inertia

Propel

Reference point

Launch a marshmellow 10 times and record the distance of each launch. Find the average distance.

Make one adjustment on your catapult and launch the marshmellow 10 more times, record the distances. Find the average distance.

Make another adjustment to the catapult and launch your marshmellow 10 more times recording distances. Find the average.

Construct a data table to record all measurements. Measurements should be made in meters and centimeters.

Vocabulary

Acceleration

Definition: The change in speed over time

Context: You can calculate the Pit Crew's acceleration during the first 10 seconds of the race with the information you have about their climb.

Force

Definition: Strength or energy exerted; cause of motion or change

Context: Both teams know that getting their vehicle up the hill will require a great deal of force.

Inertia

Definition: The tendency of an object to resist any change in its motion

Context: It's not moving and, because of inertia, it will take an outside force to make it move.

Propel

Definition: To push or drive forward or onward by, or as if by, means of a force that imparts motion

Context: If their vehicle weighs less than the other team's, the Jet Jocks' engine won't need to exert as much force to propel their buggy up the incline.

Reference point

Definition: A fixed point of comparison

Context: Each vehicle will attempt the climb by itself, so the starting line serves as a reference point, or fixed point of comparison.