E. P. Todd School and Mary H. Wright Elementary STEM Action Plan

Authors: Lisa Smith, Dan Vangsnes, Erin Lee, Randy Dendy

Disciplinary Area: STEM

Unit: Forces of Motion

Standards:

Math- 3MD4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units- whole numbers, halves, quarters.

RST. 6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or preforming technical task.

3-PS2-2 Make observations and/or measurements of an objects motion to provide evidence that a pattern can be used to predict future motion

Big Ideas:

- Science is a process for producing knowledge
- Engineering is the application of science and technology
- Tools & techniques
- The role of creativity and problem solving
- Engineering design
- Design under constraint
- Fundamental concepts of science and technology

Essential Questions:

- Which catapult design will launch the projectile the furthest distance- 1st semester
- Which catapult design will launch the projectile with the most precision-2

Scenario:

Materials and Resources:
Popsicle sticks, rubber bands, clothespins, duck tape, spoons, large paper clips, pencils, milk top, Kleenex box, chopsticks, masking tape, marshmallows
You are 6 days into a 2 week hiking trip with a group of friends near the Jocassee Gorge in Piedmont of South Carolina. As you walk along the trail you notice how steep the cliff walls are that drop down into the Gorge. You and your friends are trying to decide how deep the gorge is (about 365 m) when you hear cries for help coming from across the Gorge. You notice a group of hikers who appear to be stranded across the river.

They decided to cross the Gorge on a rickety old bridge that gave way just as their last group member finished crossing. The hikers indicate to you that they have been stranded for 4 days now without any food or water. They are dehydrated and weak, you must do something to help them! You all try your cell phones but you have no signal. Two of your group members volunteer to hike back out of the wilderness to alert the authorities, but you know that you must do something to help the hikers until someone can come rescue them. But how will you get food and water across the Gorge to them? The cliff walls are too steep to climb down. Can you think of anyway to help them?

**Deliverables:**

1st-Semester
Using only the materials supplied by your instructor, you and your group must build a catapult that can launch a projectile the farthest distance. You will be supplied a marshmallow to test your catapult.

2nd- Semester
Using only the materials supplied by your instructor, you and your group must build a catapult that can launch a projectile with the most precision. You will be supplied a marshmallow to test your catapult.
Parameters:

- Students can only use supplied materials.
- Only the marshmallow can be used as the projectile.
- After the marshmallow is launched only two student will be allowed to measure the distance while other students check for accuracy.
- Include brainstorming sheet and working drawing that illustrates how the machine was designed.

Assessment:
Rubric will be supplied