

Science Lesson Plan

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Date: 2/26/13

Lesson Title: Catapult Creations

Grade Level: Grade 3

Ration for Lesson: This lesson is very hands on, and I feel that science is best learned when you actually get to conduct it. Also I wanted to have an activity/ experiment that wasn't a "cookbook" activity. Students are supplied with their own materials and have the opportunity to create their own catapult using their knowledge of force, gravity, and levers. This lesson helps students understand the abstract idea of force, gravity and levers, and is developmentally appropriate for this grade level.

Utah State Core Curriculum ILO and Content Standard, Objective and indicator(s):

Utah State Core: *Standard 3:* Students will understand the relationship between the force applied to an object and resulting motion of the object. *Objective 1:* Demonstrate how forces cause changes in speed or direction of objects.

ILO: 2. Manifest scientific attitudes and interests. 4. Communicate effectively using science language and reasoning.

Vocabulary Focus: Levers, Fulcrum, Resistance Force, Effort Force, and Gravity.

Preparation Materials:

- 1 3x5 index card
- 3 large paper clips
- 1 bottle of liquid glue
- 10 tongue depressors or popsicle sticks
- 10 rubber bands of various size
- 2 straws
- 1 plastic spoon
- 1 12 inch piece of string
- 1 pair of scissors
- 1 ruler
- 1 gallon size zip-lock bag (all materials go in here to give to the student groups)
- Target

Lesson Description: A pre-catapult launch – collect a variety of lever type objects such as paint sticks, plastic serving spoons, rulers and other items so that each small group of students will have one or more to try. Crumpled paper balls or giant marshmallows can be used for launching the marshmallows must not be eaten but marked with the individual's initials, so that the missile may be reclaimed!

Instructional Procedures

- The target is placed in the middle of the room
- The children's desks are placed, equal distance from the target.
- The students must remain sitting.
- The “missile” must be touching the launching object before launch. It cannot be launched by hand.
- The missile must be on the desk.
- The children may set up the tools any way they wish.
- Count to three and launch.
- Provide a 3x5 index card.
- After launch, introduce the word “lever.” The main parts of the lever can be described; fulcrum, resistance force and effort force.

Assessment: This is a participation project. If the children are involved, cooperating and participating in their groups, points will be awarded. Also the 3x5 index card describing their design and data as well as a drawing can be used. The last assessment piece is the correct use of vocabulary, and appropriate labels on the design.

Adaptation for Gifted/Talented, ELL and Special Education:

More Complicated Catapults for Advanced students:

The students may use scissors, ruler and glue to help build the catapults, but they may not be part of the catapult itself. Allow the students to examine the contents of the bag and discuss the items and brainstorm before building; 5 minutes is a good amount of time. Allow the students to build for approximately 30 minutes and set a timer. As the students build ask them about their design and remind them of what the lever is and does. When the time is up, test the catapults! The target can be used again. Everyone will start the same distance from the target and the results will be measured and charted! Display their machines with the distance the paper or marshmallow flew.

ELL learners and Special Education:

Provide directions and vocabulary terms in both English and Spanish. Allow students to use pictures to describe design rather than words. Also have a few “blue prints” that students may choose from to follow if they need more support.

