

Catapult Creations

Summary

A demonstration of how a catapult works and an activity which asks students to build their own helps them understand the concept of force and its effect on an object.

Group Size

Large Groups

Materials

Instructional Procedures

- Launch mechanism

- Target

- Large marshmallow

- Paper

- 3x5 cards

More Complicated Catapults

- 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 (I have many of these)

- 2 straws

- 1 plastic spoon

- 1 12 inch piece of string

- 1 pair of scissors

- 1 ruler; inches and metric

- 1 gallon size zip-lock bag (all materials go in here to give to the student groups)

- Target

Additional Resources

Books

Backyard Ballistics, by William Gurstelle; ISBN 1-55652-375-0

Background for Teachers

Using a variety of easily found tools children will have an opportunity to observe, participate in creating and use catapults and levers. The children should understand the ideas of balance, force, motion, push and pull.

Intended Learning Outcomes

2. Manifest scientific attitudes and interests.

4. Communicate effectively using science language and reasoning.

Instructional Procedures

Invitation to Learn

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 -- in fact, both are preferable. 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.

Extensions

Curriculum Extensions/Adaptations/ Integration

More Complicated Catapults

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. Add another experiment card to the Science Journal Pocket Folder, a photo of the machine is helpful.

Family Connections

Try building a catapult at home; how far can a potato be launched. What kind of materials would be required to move an item of this size and weight?

Plastic spoons and frozen peas make mini catapults and will biodegrade in the back yard.

Assessment Plan

This is a participation project. If the children are involved, cooperating and participating in their groups; points may be awarded.

3x5 index card describing their design -- drawing is acceptable.

The correct use of the vocabulary; the drawing can be labeled.

Bibliography

Research Basis

U.S. Department of Education. Office of Communications and Outreach. *Helping Your Child Learn Science*, Washington, D.C.

This article contains information about science and science activities that can be done simply at home and at other sites. There are multiple suggestions for working with teachers and within the school system along with a list of science related sources that does include books, magazines, science camps and other information. It helps a parent discuss science and "find" science in the community where the family resides.

Authors

[Utah LessonPlans](#)