

Catapult Challenge

Due: 11/24/15

An inquiry based activity for middle school science, and the Design Process

Description: This activity introduces the concept of catapults to students and challenges them to design and build a working model with simple materials. Science objectives such as types of energy, knowledge of simple machines and projectile motion can all be covered with the implementation of this project.

Goals:

- To establish understanding about projectile motion, Newton's Laws of motion, accuracy and precision
- To introduce students to the engineering principles behind simple machines designed to launch a projectile with accuracy and precision
- Design & build a catapult for accuracy and distance. *(enough supplies to build two catapults)*
- You may choose from one of the designs or build your own.
- Turn in Information sheet, data chart, and catapult.

Catapults

Throughout history, humans have created machines to give them advantages in performing otherwise difficult tasks. These machines do everything from lifting heavy objects, to carrying us long distances, to launching projectiles faster and further than any one human could throw one. The birth of launching missiles came with the inception of the catapult. The catapult gave its owners the advantage of being able to launch relatively heavy objects (heavy rocks) over, or through their enemies walls and armies in hope of hitting their intended target. Because of this, the army with a better catapult often possessed a greater chance of success when it came to battle with its enemies. What then makes a catapult better? Well, the ability to shoot an object high and far was the first task to overcome, yet just as important, the control and accuracy of the object helped damage the intended target instead of having to deal with rocks landing in someone's backyard instead of over a castle wall.

Building a Catapult

Step 1: Decide how your catapult will store energy

A catapult is a mechanism that takes potential energy and turns it into kinetic energy. It does this by storing energy in twisted rope, a spring, or something elastic (like a rubber band). With your given materials, you must decide what devices, or combination of devices will power your catapult.

Catapult Challenge

Team Members

Hour _____

1. _____

2. _____

3. _____

All Materials Used

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

Completed Drawings with dimensions

Top View

Side View

Accuracy	1	2	3	4	5	Average
Points						

Distance	1	2	3	4	5	Average
Inches						

1. What is a catapult?
2. Which Newton's law is being used?
3. Which mechanism is used in your catapult?
4. Two facts of early history of catapults.
5. Explain why you chose your catapult design