



Catapult Conquest
A Design Technology Project
KIS, 2008-2009

Introduction

Catapults are a result of Human Ingenuity (Homo Faber). This week we will investigate the science and math of catapults. Using the Design Cycle we will seek to answer the question, "Why and how do we create?" We will also investigate the historical context of catapults in order to better understand "What are the consequences?"

Throughout this week we will have opportunities to put the Profile Words into practice. Take some time to think about how we can live the Profile Words in our project this week:

Thinker -

Inquirer -

Knowledgeable -

Communicator -

Principled -

Reflective -

Balanced -

Caring -

Risk Taker -

Open Minded -

Task

Build a catapult that can throw a squash ball.

Objectives

- 1) Throw the ball the furthest distance
- 2) Throw the ball accurately a short distance (less than 10 meters)
- 3) Throw the ball accurately a long distance (more than 10 meters)

Restrictions

- 1) Your catapult must not be larger than 40 cm in any dimension (it must fit inside a box that is 40cm x 40cm x 40cm)
- 2) Your catapult may not use any electrical or chemical propulsion (no motors, explosions, compressors, etc.)

Rules

- 1) All distances are marked where the ball first bounces, not where it stops.
- 2) For Distance Throws, all distances are marked by lines parallel to the throwing line, not the actual distance thrown if the throw is not straight.
- 3) For Accuracy Throws, points are awarded only if the ball lands within the 1 meter throwing lane, none are awarded if it lands outside of the lane even if it is the correct distance.

Rubric

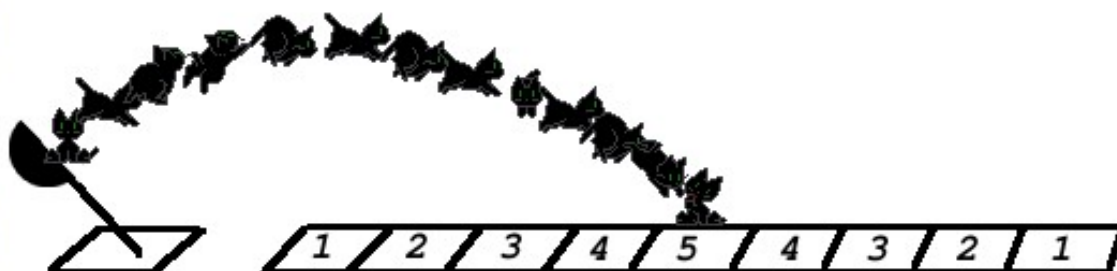
Score	Distance	Accuracy #1	Accuracy #2
0	Does not throw at all	Does not land in the target lane at all	Does not land in the target lane at all
1	More than 0 meters	Lands 4 boxes away from the target box	Lands 4 boxes away from the target box
2	More than 5 meters	Lands 3 boxes away from the target box	Lands 3 boxes away from the target box
3	More than 10 meters	Lands 2 boxes away from the target box	Lands 2 boxes away from the target box
4	More than 15 meters	Lands 1 box away from the target box	Lands 1 box away from the target box
5	More than 20 meters	Lands in the 1 m ² target box	Lands in the 1 m ² target box

Additionally the top 3 in each category will receive bonus points

First place – 3 points

Second place – 2 points

Third place – 1 point



Design Cycle



The Design Cycle will be an important part of your project. You will start building until you have a Plan. Make sure to follow the steps of the cycle as you complete your project.

Investigate

A catapult can be classified into one of three groups:

- 1) Ballista;
- 2) Mangonel / Onager; or
- 3) Trebuchet

What is the difference between a Mangonel and an Onager?

	Ballista	Mangonel / Onager	Trebuchet
When did it originate?			
Where did it originate?			
How does it "throw" an object?			
Benefits?			
Limitations?			

Plan

What type of catapult is your group going to design? _____

Sketch

- Your sketch should be a scale drawing (1 cm = 5 cm)
- Label all lengths
- Draw your catapult from multiple angles if necessary (top, bottom, left, right, etc)
- Your sketch should be neat!

Material Request

- What materials will you need to create your catapult?
- What materials do you need to find yourself?
- What sizes of wood do you need cut?
- Now fill out a material request form and turn it in!

Evaluate

Use this sheet to evaluate your catapult and identify areas that need to be re-planned.

Trial #	Angle of Release	Power	Distance	Other Notes

How is the overall quality of your catapult? Can it be improved or upgraded?

How is the power of your catapult? Too weak, or too strong? Can it be improved?

How well does your catapult release the ball? Too early, or too late? Straight or to the side? Can it be improved?

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Material Request Form

Group Number - _____

Group Members - _____

Date Requested - _____ Time: _____

Item	Size	Number of Pieces
Special Notes:		

Received by

Signature

Time

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