

Catapult/Trebuchet Activity

Colorado Standards:

Learn more at: <http://www.pbs.org/wgbh/nova/lostempires/trebuchet/>

Interactive Trebuchet: <http://www.pbs.org/wgbh/nova/lostempires/trebuchet/destroy.html>

Purpose: Each group will create a catapult device and measure the force and speed associated with such a device.

Task

Each catapult must launch a projectile a distance more than 3 meters, but less than 5 meters. The device will be graded on consistency, that is, how close the spot of each projectile's landing is. Each device will be adjustable so it will throw a different distance. The catapult must have a release system (trigger) that includes a simple machine. The input force must come from the rubber band or gravity.

Materials

Each group will start with 35 Newtons to purchase materials. These are the only materials supplied.

	Cost in Newtons	
Craft Stick (small)	1	
Craft Stick (Large)	2	
Rubber Band	2	
Dowel	5	
Card board Base	5	
Glue Stick	2	
String	1	
Paper clips	1	
Straw	1	
Medicine cup	2	
Mass	5	

Group roles

- Construction
- Paperwork and Materials
- Time and Task Keeper
- Communicator

Grading Criteria

20% Catapult

30% Paperwork

30% Group Dynamics

10% Accuracy of Test launch

10% Budget

Rubrics Catapult

	Advanced	Proficient	Partially Proficient	Unsatisfactory
Appearance	Proficient with an effort to enhance the appearance of the catapult that works.	Cuts are neat. Seams are neat and without excessive glue. Pieces are aligned.	Cuts are not neat. OR Seams are not neat or with excessive glue. OR Pieces are misaligned	Two of the following Cuts are not neat. Seams are not neat or with excessive glue. Pieces are misaligned.
Performance	Catapult has additional features. For example more adjustments or a mechanical trigger.	Catapult launches projectile between 3 and 5 meters. Catapult is adjustable.	Catapult fails to launch projectile between 3 and 5 meters or is not adjustable.	Catapult fails to launch projectile between 3 and 5 meters and is not adjustable.
Lab work and Clean up	Group left area better than they found it.	Group clean up after them selves.	Groups left messes for others	Group wasted materials and damaged equipment.

Group Rubric

	Advanced	Proficient	Partially Proficient	Unsatisfactory
Time on Task	Group worked outside of class	Class used most of class time	Some or all of group we observed off task. Members warned about talking out of group	All of the group was observed off task more than once. Multiple warning for out of group chatter
Group cohesiveness	All group members get along, all tasks completed, group goes on to take over fortress and rule justly	Group gets along with minimum disagreement. Group form bond that last a life time.	Group was observed bickering or name calling. One group member not performing assigned duties. Group turns catapult on teacher	Group was observed bickering or name calling more than once. More than one group member not performing assigned duties. Teacher must mediate Group turns catapult on itself.
Roles	All members succeed in roles, are asked to recreate roles on Broadway	Task is performed, students mostly follow roles	Tasks are not completed Member switch roles.	Tasks are not attempted Members try to take over other roles.

Job Descriptions

These are the main responsibilities of each role, everyone is responsible for cleaning up.

Construction Manager

This is the person who makes the cuts and holds the glue. Everyone should help, but the CM will do most of the hands on and make the day to day decisions. However the CM will not be allowed to over-ride the groups decisions on what to build.

Group Leader

Keeping in mind that this is a democracy, the leader should be the one who can bring everyone together. The leader will keep track of paperwork and material, so will need to be organized and dependable. The group should be comfortable with the leader's decision making ability, although they will be expected to consult with the rest of the group on big decisions.

Technology

This person will do the needed research and be expected to keep the group on task. One job is to make sure the group has time at the end of every class to finish their time sheets. Also keeping an eye on the big picture would be good. Someone who can remind people of tasks without sounding like a nag would be a good choice.

Communicator

This is the one person who will talk to other groups and Mr. Warner about problems etc. They will help the leader with paperwork and budgets

Daily jobs, groups fill out time cards, groups will make these up, laying out each persons jobs
Order sheets
Buy only at beginning and end
Those who do not abide by contract will be fired.