Ames Public Library **@HOME Activities**

Catapults

Catapults are devices that can launch a projectile to a great distance. Catapults have been used since ancient times by the Chinese, Greeks, and Romans. Today, catapults are used to help launch airplanes from ships. To build a simple catapult see a related video on the Library's YouTube Channel at http://bit.ly/APLvideos.

Books and Media:

Title	Author / Performer	Call Number
STEAM lab for ids: 52 creative hands-on projects using science, technology, engineering, art and math	Heinecke, Liz Lee	J 507.8 HEI
3-D engineering: designs and build practical prototypes with 25 projects	May, Vicki V.	J 620 MAY
Junk drawer engineering:25 construction challenges that don't cost a thing	Mercer, Bobby	J 620 MER
Rubber Band Engineer	Akiyama, Lance	J 745.592 AKI
The Renaissance Inventors: with the history projects for kids	Klepeis, Alicia	J 940.2 KLE
DK Findout! Engineering	(DK)	ebook
STEM programming for all ages	Pard, Chantale	ebook
Let's learn (DVD). S.T.E.M Vol. 2	(Niclelodeon)	J 500 (DVD) STE
Left brain! Right brain! STEAM (Launchpad tablet)	(Findaway World LLC)	J 523.4 (DVD) NYE

Websites:

URL	Notes
https://sciencemadefun.net/blog/medieval-engineers-the-science-behind-the-catapult/	

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Take Away Kit: Catapult

Bag Contents:

- 9 craft sticks
- 7 rubber bands
- 1 plastic spoon
- Pompoms

To build your catapult follow these directions or watch the Catapult @Home Activity video on the library's YouTube Channel at http://bit.ly/APLvideos.

- Take 7 of the craft sticks and rubber band them together at both ends, so it forms a stack of craft sticks.
- Take the 2 remaining craft sticks, stack them, and rubber band them together on only one end so the other (opposite) end is open. Slide the rubber band down so it's close to the end.
- Next, pull the side that is not rubber banded slightly apart, and slide the stack of 7 in toward the end.
- To secure the stack in place, rubber band that end in a cross or X-shape. You will use two of the rubber bands.
- Next rubber band the plastic spoon to just the upper craft stick.
- Place your projectile (pompom) into the spoon.
- Hold the catapult with one hand or place it on a table. Pull the spoon with the pompom down and release to launch your pompom.

What is the science behind the catapult?

When you pull back the craft stick, potential energy, or "resting" energy gets stored up. And when you release the stick, the potential energy turns into kinetic energy, "moving" energy! Then gravity eventually pulls the launched object back to the ground.

Source: Penn State Behrend, https://behrend.psu.edu/school-of-science/research-outreach/science-story-time/experiment-catapult




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Vocabulary

Engineer – The verb form of the word means to design or build machines, devices, or structures. The noun form of the word indicates a person who builds and creates different structures.

The engineering design process – This is a cycle of steps that engineers engage in when designing or creating a product.

Elastic potential energy – Potential energy is energy that is stored in an object because of its position relative to other objects. Examples of potential energy include a stretched rubber band (elastic potential energy), compressed spring, or a hammer held at a height (gravitational potential energy).

Energy – Is the capacity for doing work. Energy is how things move and change. There are many different kinds of energy.

Kinetic energy – This is the energy of a moving body.

Model – In engineering this is a representation of a concept that isn't to scale or doesn't function fully.

Technology – This is any tool that is designed to make a task easier, quicker, or simpler. Basic everyday technology include scissors and pencils to more complex ones like washing machines, televisions, and computers.

Tension – This is a pulling force; tension could be the opposite of compression.

Torsion – This is the twisting of an object due to an applied torque or twisting force.

Projectile – This is any object that is thrown by the use of force.