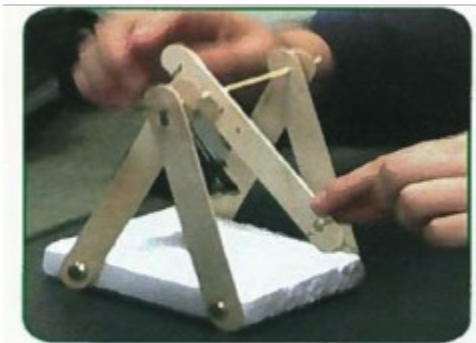
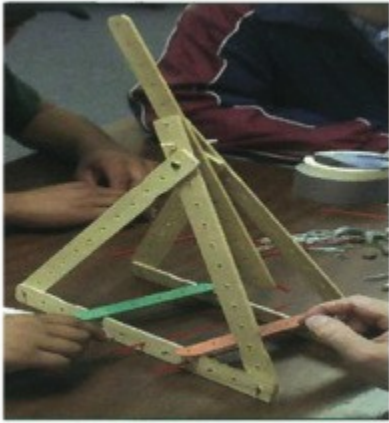


<http://www.pickyourspin.org/junk-drawer-robotics-week-one.html>

Anything that is built must first be planned out. An engineer is a person who designs and builds complex products, machines, systems, or structures.



Marshmallow Catapult

Design a catapult that satisfies the following requirements:

- A trebuchet-style swing arm.
- The arm must be adjustable (moveable pivot point).
- Use at least 5 different types of materials or parts (craft sticks, brads, dowels, paint stirring sticks. etc.).
- Use weights and gravity as power source.
- Launch a Marshmallow at least 6 feet!

Browse the internet (with an adult or with adults permission) for pictures of different types of catapults. Search for a trebuchet-style catapult. Think of how you could design a trebuchet-style mini catapult, big and strong enough to launch a marshmallow with items from your Trunk of Junk (see week 1). Put on your engineer hat and make a sketch of your design idea. You may find you have to make several different sketches before you are ready to begin construction.

Did you know??

During the design process, engineers:

- Identify the problem or challenge.
- Identify design requirements and limitations on the design due to available resources and the environment.
- Brainstorm possible solutions to the problem or challenge.

- Generate ideas and develop the most promising ones.
- Explore possibilities and the pros and cons of each.
- Select an approach by identifying the design that appears to solve the problem best.
- Build a model or prototype.
- Refine the design by identifying changes that need to be made and improving the model or prototype.

(nationalgeographic.com)

Helpful Hints:

- Ask an adult to help drill holes in whatever material you choose to use as the base and arm of the catapult, draw dots where you want the holes first and make sure they will line up when put together.
- Consider using paper clips to hold weight on.
- Use washers for weight.
- Plastic spoons make a great payload (marshmallow) holder!

Try it out!

It is extremely rare for engineers to get a working design exactly right the first time. Try launching a marshmallow with your catapult.

- How far did the marshmallow go?
- What could you do to make it go farther?

If your catapult didn't work at all, go back to the ***Did you know??*** list and see what improvements you could make.

"A business friend once asked Thomas Edison (inventor) about the secret to his success. Edison replied, "Genius is hard work, stick-to-itiveness, and common sense". But his "common sense" was very uncommon. More patents were issued to Edison than have been issued to any other single person in U.S. history: 1,093."