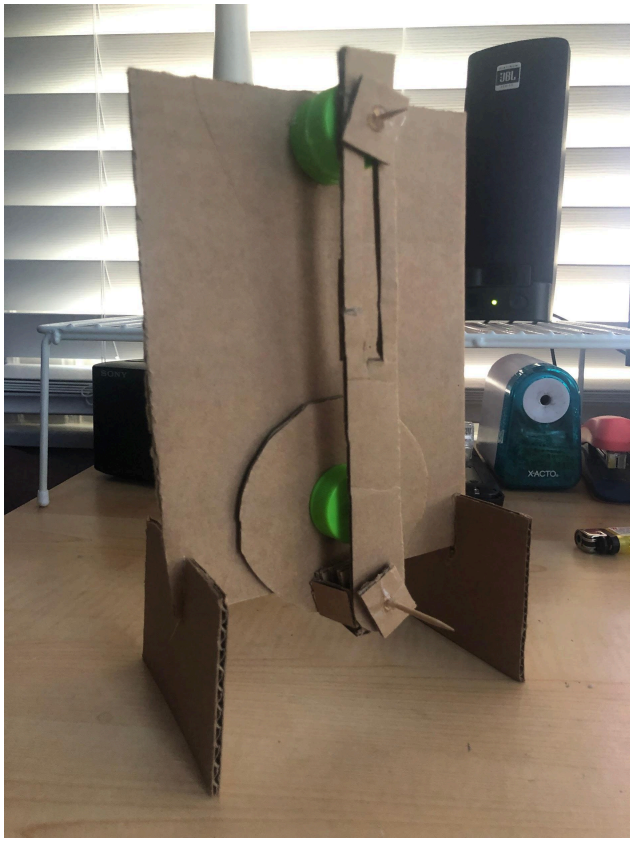
Up and Down Crank!



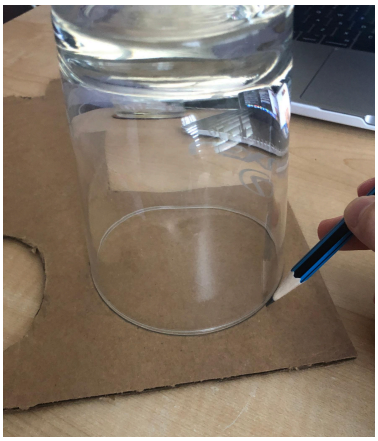
Materials:

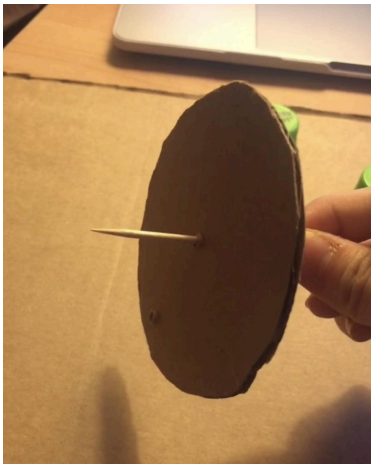
- Cardboard
    - 1 or 2 pieces of cardboard, each about the same size as a piece of paper, should be enough.
- 4 Plastic bottle caps.
    - Try to find ones that are about 1cm (0.4in) tall with a diameter of 3cm (1.2in), and are fairly stiff.
- 3 Toothpicks

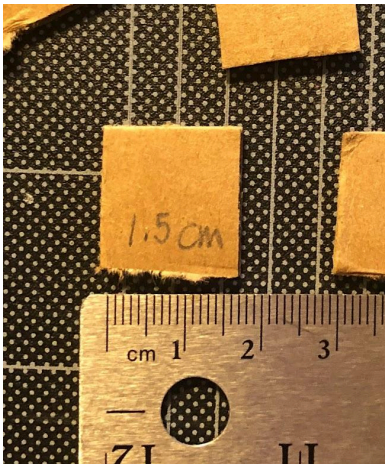
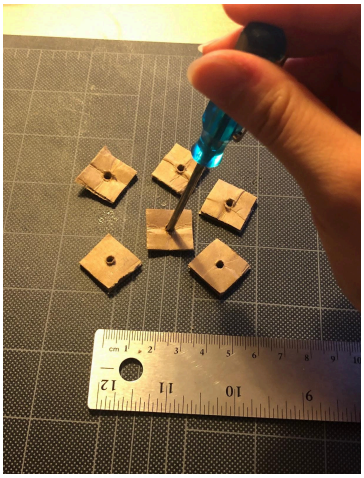
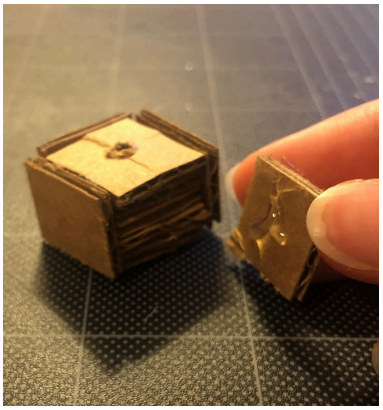
Tools:

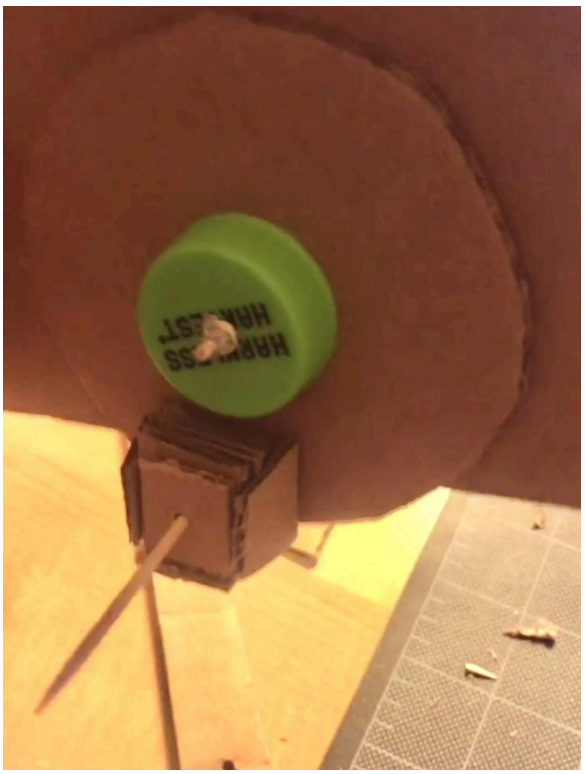
- Hot glue gun (Be careful when using hot glue. Parent supervision is advised)
- Scissors
- Small Phillips head screwdriver

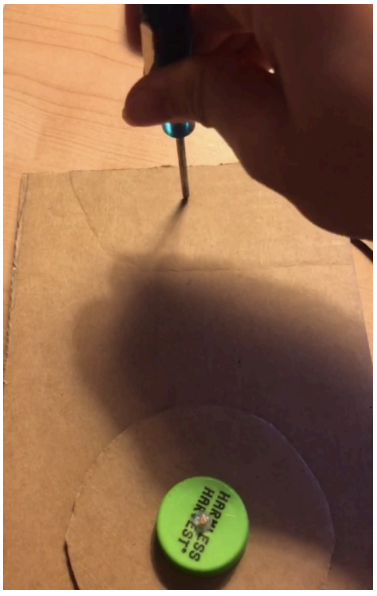
Instructions

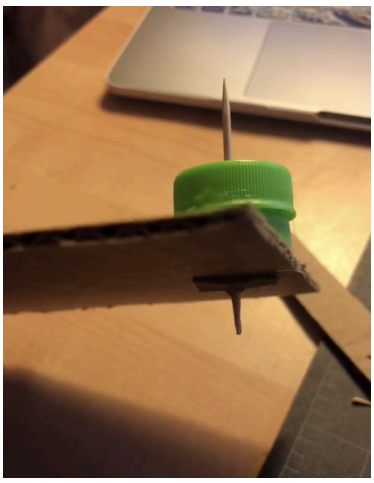
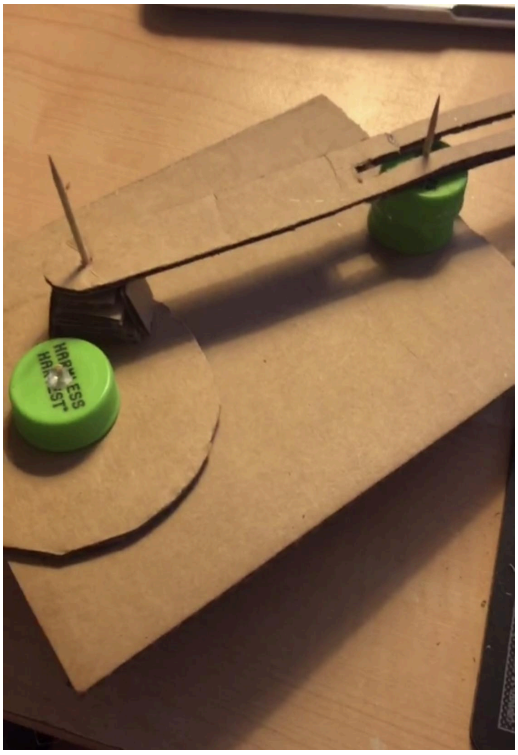
 	1. Cut a piece of cardboard into a circle with a diameter of about 8-9 cm (3-3.5in). This will be the **crank wheel**. You can trace the circle by using a compass or by tracing the rim of a glass onto the cardboard.
 	2. Use a small screwdriver to punch a hole in the center of two bottle caps. Punch 2 holes in the crank wheel too (see photo)

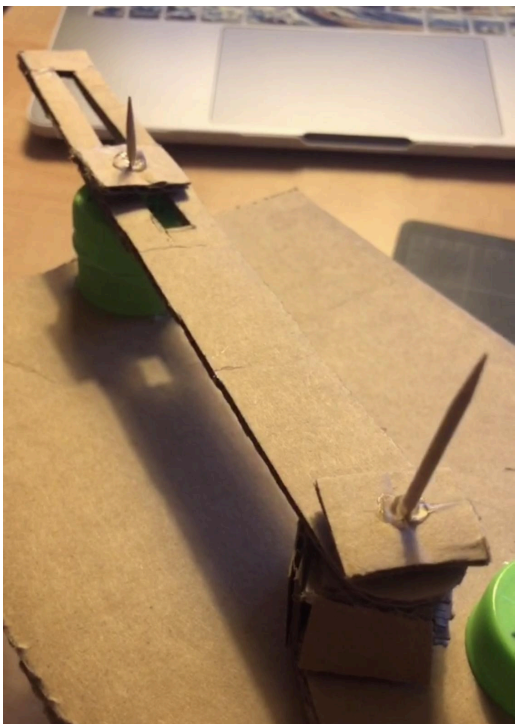
 	3. Place a toothpick through the center hole of the crank wheel. Hot glue into place.
 ^base plate ^linkage bar	4. Cut two pieces of cardboard. -Rectangle (**base plate**): 14cmx19cm (5.5inx7.5in) -Narrow rectangle (**linkage bar**): 2cmx25cm (0.8inx9.8in) Then, use the small screwdriver to punch holes where indicated by the black dots in the photo.

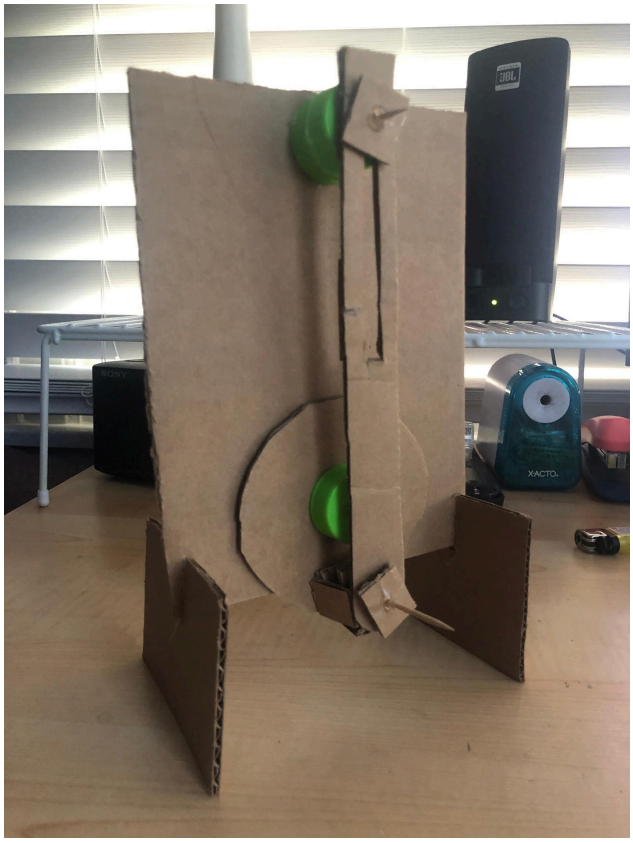
 	5. Place the toothpick attached to the cardboard circle through the hole on the base plate. Then, place the other bottle cap on the back side over the toothpick. Hot glue into place.
   	6. Cut 10 1.5cmx15.cm (0.6inx0.6in) cardboard squares. Punch a hole in the center of 6 of them with a small screwdriver. Then, stack the 6 squares and glue them together(the ones with holes). Then, use the other 4 squares (the ones w/o holes) and glue them to the sides of

	the stack, forming a sort of cube. Glue it over the top of the second hole on the crank wheel. Get a tooth pick and stick it into the hole. Hot glue into place. This is done so that when the linkage is attached to the toothpick, it will protrude from the crank wheel far enough so that it doesn't get stuck on the bottle cap when the crank is turned. Also, it holds the toothpick firmly in place.

	7. Cut out an empty space (about 9cmx0.5cm (3.5inx0.2in)) in the linkage bar.
 	8. Punch a hole at the top center of the base plate. Put a toothpick through the hole.

 	9. Get two more bottle caps, and punch holes in them. Stack them over the toothpick, and glue into place.
	10. Place the linkage bar over the two vertical toothpicks. Then, cut two small cardboard squares, punch a hole in the centre of each of them. Place them over the toothpicks, on top of the linkage bar. Hot glue them into place. Be sure to glue them in a position that allows the linkage to move freely.

	
 	11. Cut out two small rectangles (7cmx10cm). These will act as a stand for the crank. Then, cut out a narrow slit in each one (about 3mm, or the thickness of the cardboard) Attach these pieces at the bottom of the crank with hot glue.

	
	And that's it! This is what the finished product should look like. Feel free to modify it in any way to make it your own.

Click here for a video of the crank:
https://youtu.be/S-AtLJN1N_Q

Click here for a video of me making the crank:
https://www.tiktok.com/@katieskontraptions/video/6862745079526739205?_d=secCgsIARCbDRgBIAIoARI%2BCjxmwfvFXcChFuBzpka3sCIRvvJZj1zwAcPxBd5oSekKtUtzFGYuZay1Yl6sDjsgazZIQbvOnCo%2F69EtJIkaAA%3D%3D&language=en&preview_pb=0&sec_user_id=MS4wLjABAAAAahyuc6uk8KsbH3FMXnQYNFgGu4aXUG5jiLvdqY8iiQDXfkPj9bMBxYOVRlzK3qSa&share_item_id=6862745079526739205&share_link_id=64563CCC-B475-40D0-BE03-77AE5A37F642&timestamp=1598037122&tt_from=more&u_code=de122d9i9mi99d&user_id=6860317763723215878&utm_campaign=client_share&utm_medium=ios&utm_source=more&source=h5_m