Bottle Cap Fish - 66730A
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Bottle Caps go in Here

The ocean contains 1 ton of plastic for every 3 tons of fish. If nothing changes, by 2050 there will be more plastic in the ocean than fish.

Our community does not recycle plastic bottle caps. Please do your part to help the environment by depositing any caps you have here, the caps will be transported to a facility that can recycle them.

<u>Inspiration and Creation</u>

I was surprised when I found out that my community does not recycle plastic bottle caps because they are made of a different type of plastic than the rest of the plastic bottle. This encouraged me to develop a recycle bot that would not only capture peoples' attention to educate them about the importance of recycling but also to give people a location to deposit their bottle caps so that they can be transported to a site that is able to recycle them. I believed the best way for my robot to capture peoples' attention would be for it to be interactive and show the importance of recycling in a new and creative way. This inspired me to use recycled parts to create an automaton, a mechanism in which the turning of a crank or other input triggers the movement of another mechanism. I decided that my automaton would involve a fish made from plastic and a crank that when rotated would cause the fish to make a swimming motion. I would also put statistics about plastic pollution on my robot and have a container with information concerning how our community does not recycle bottle caps and how placing them in the container will allow them to be recycled. I amassed the materials I thought would be necessary for my robot by emptying my family's recycling bin (much to their irritation). Whenever I faced a challenge, that I needed more materials to overcome, I returned to our recycling bin. I first made the fish using a plastic bottle for the body, green construction paper for the fins, and some cardboard for eyes. Then I proceeded to construct the automata mechanism. I decided to drill off-centered holes in bottle caps, so they could act as the cams for my automata and to use paper straws as axes. After I had a paper straw axle with two bottle cap cams on it going through the side of my box, I drilled holes above the cams, through the top of the box, and inserted straws into them. I then hot glued cardboard to the bottom of the straws so that it would rest on top of the cams and their rotation would trigger the straw and cardboard to move up and down. I also attached half of a popsicle stick to the end of the axle with the cams on it to act as a crank. I tried turning the crank but instead of moving up and down the straws and cardboard were just pushed backwards by the cams and didn't move. To overcome this challenge, I drilled new holes through the top so that I could have 2 straws attached to each piece of cardboard to further stabilize it. I also attached cardboard to the top of the box to support the straws as they move. Now, when I turned the crank, the straws moved up and down. Another issue I faced was that the axle with the cams could move left and right, so I attached bottle caps to the axle at either end of its connection with the box so that it could no longer move. I finally attached the plastic bottle fish to

the straws and when I rotated the crank the fish made swimming motions. Next I attached my automata to the lid of an empty coffee grounds container and cut a hole in the lid where people could place their bottle caps. Finally, I printed out statistics about plastic in the ocean and information about our communities bottle cap recycling policy and how people can place their caps into the container, and they will be transported to a facility that can recycle bottle caps.

<u>My robot's purpose</u>

My robot's purpose is to educate people about the importance of recycling in a new and creative way and to help people recycle their plastic bottle caps.

<u>My final bill of materials</u>
- 1 - Plastic water bottle
- 4- Plastic water bottle caps
- 1 - Cardboard box (Dimensions: 5 inches by 7 inches)
- 1 - Cardboard sheet (Dimensions: 3 inches by 3 inches)
- 5 - Paper straws (Dimensions: 0.25 inch diameter and 8 inch length)
- 2 - Wooden popsicle sticks
- 1 - Coffee grounds container (Dimensions: 6.5 inch diameter and 6 inch height)
- 1 - Sheet of green construction paper (Dimensions: 5 inches by 5 inches)
- 1 - Sheet of printer paper (Dimensions: 8.5 inches by 11 inches) and access to red and black printer ink
- 1 - Recyclable and biodegradable hot glue stick (to attach everything together)

My completed robot:

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Bottle Caps

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The fish moves!