



Hydraulic Elevator

You'll learn about hydraulics and how it is possible to use a small amount of force to create a larger force somewhere else.

Ages 10+



SAFETY MOMENT

Spills & Slips

If you spill something on the floor or see a spill, it's important you clean it up quickly or inform an adult who can. Leaving spills on the floor could cause others to slip and fall, potentially injuring themselves. Be kind, clean it up.

Provided Materials:


17 Jumbo Popsicle Sticks 

2 Oral Dispensers & Tubing 

4 Wooden Skewers 

Wire 

You'll need to supply:

Tape 

Water 

Scissors 

STEP 1

Gather the 12 popsicle sticks with holes in them.

Pair up the popsicle sticks and make sure the ones with the red marks are together.

You should have a total of 6 pairs.



STEP 2

Cut a 1-inch piece of wire and connect the center point of two sticks. Loop the end of the wire and push it flat against the stick to secure.

Do this for each pair.



STEP 3

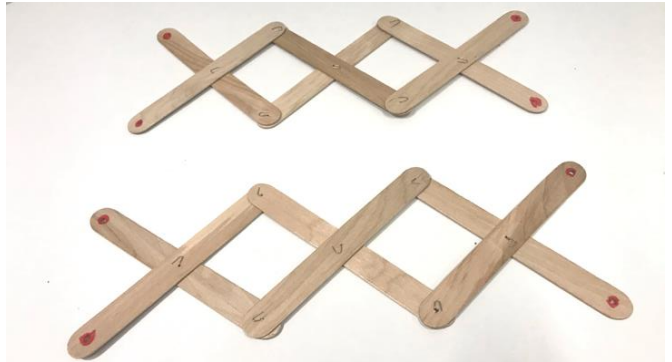
Connect 3 pairs together using 1-inch wire pieces, making sure popsicle sticks with red marks are positioned only at the very top and bottom.



STEP 4

Repeat Step 3 for the other 3 pairs.

You have two moving pieces with 6 sticks in each.



STEP 5

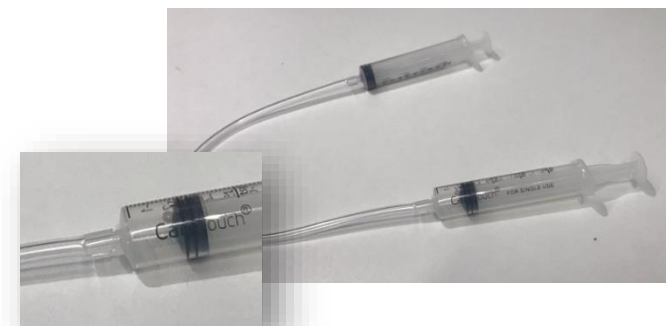
Connect the two sides together by putting a wooden skewer through the red marked holes.

Do this at the top and bottom.



STEP 6

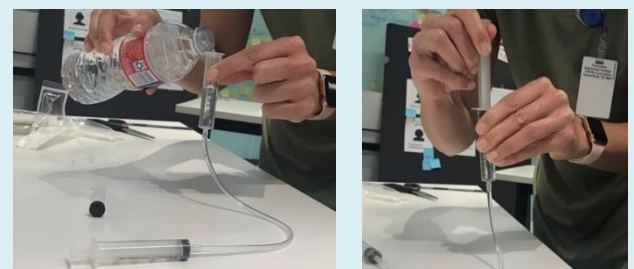
Connect the tips of the oral dispensers inside the ends of the tubing. It should be a snug fit.



STEP 7

Make sure one of the dispensers is pushed all the way down. Remove the end of the other dispenser and fill with water.

Put the end back in the dispenser. Pushing one dispenser in should fill the other dispenser.

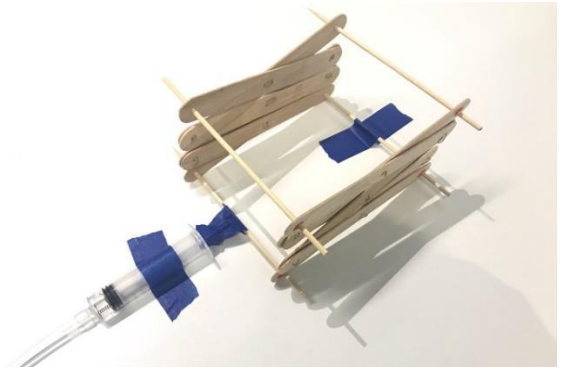


STEP 8

Tape the end of one dispenser to one of the wooden skewers.

Then tape that dispenser to the table.

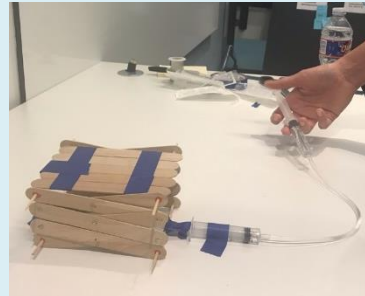
Then tape the other end of the skewer to the table.



STEP 9

Pushing the end of the dispenser should raise your hydraulic elevator.

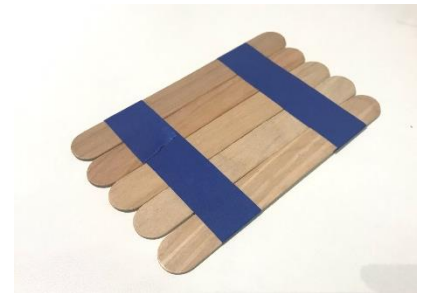
Pulling the end of the dispenser should lower your hydraulic elevator.



STEP 10

(Optional)

Tape together 5 popsicle sticks and place it on top to create a platform. You can now move items with your hydraulic elevator! (You may need to tape it to one of the skewers to secure it)



HOW DOES IT WORK?

Early peoples learned how to use flowing water to do work such as power water mills and to provide irrigation for farming. Scientists learned that all liquids follow certain rules. They learned that pressure in a liquid is transmitted equally in all directions. That is, when one pushes down on the liquid in a tube the liquid will push against whatever it comes up against, even if it is bigger than the original tube.

Therefore, it is possible to use a small amount of force to create a larger force somewhere else.

