

Make a powered boat You will need

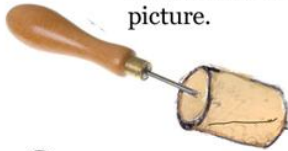
Cork
 Bradawl
 Scissors
 Big plastic bottle
 Small plastic bottle
 with the cap
 Large paper clip
 Pliers
 Ruler
 Blade
 Pencil
 A bead
 Rubberbands
 Tub of water
 Thin garden cane

There are two basic devices which operate underwater for controlling water craft.

Propeller: It is driven by a power/steam boat rotates fast and pushes the craft through the water. In real propellers the blades are set in different angles, to push water backwards as it spins thrusting the craft to move forward. Here they are two pieces of flat plastic sheets. Here, engine power is achieved by a twisted rube band.

Rudder: Helps steer the boat. It is controlled by a handle called tiller/wheel. By changing the position of the rudder you can move the craft to the left or the right but only works when the boat is moving. Also helps to keep the boat moving on a straight line.

- 1 Cut an oblong strip from the bottle of an approximate size of 3in x 7in. This is the top of the boat. (the cut out stip will be later used to make the rudder. Make a small hole at the bottom as shown in the picture.



- 2 Make a hole through the middle of the cork using a bradawl. Cut two diagonal slots on either side of the cork.

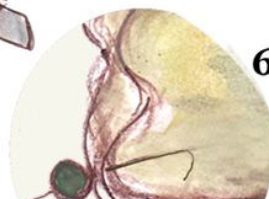
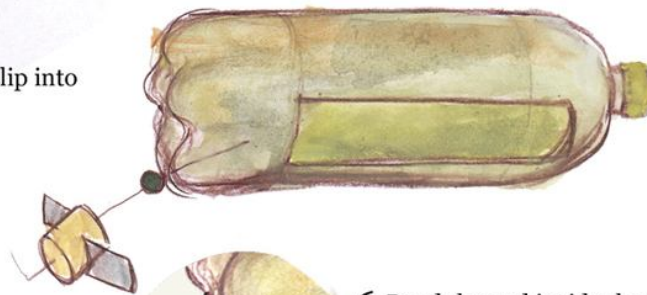


- 3 Cut out two small strips of plastic from the second small bottle of size 2 x 1 1/2in. Push two strips of plastic cut from the small bottle into the slots.



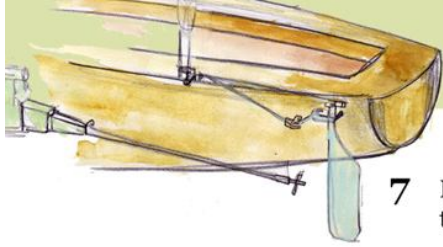
- 4 Straighten a paper clip and push it through the cork and thread it through a bead

- 5 Push the other end of the paper clip into the small hole in the bottle.



- 6 Bend the end inside the bottle.

Make a powered boat



7 Hook a rubber band onto it and twist and stretch it all the way to the top through the neck of the bottle.

8 Secure it by putting a pencil through the rubber band.



9 Use the strip from the bottle to make a support for your rudder.

10 Make two holes about $\frac{3}{4}$ apart on the strip. Push the cane through one holes as shown in the picture

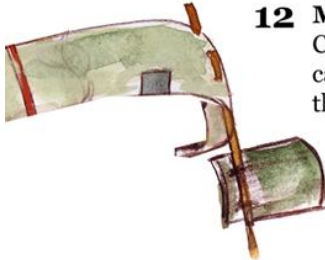


11 Use the rubber band to hold the strip in place around the bottle. It should be tight or else the strip will slip off the bottle.

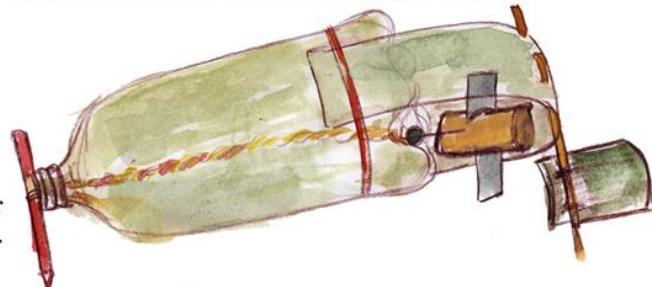


12 Make a rudder

Cut a piece of plastic about $1\frac{1}{2}$ " x $1\frac{1}{2}$ ". Pierce two holes and push the cane through the holes as shown. The rudder should be positioned such that it goes below the bottle, with the hole in the bottle being on top



13 Wind up the pencil and place your boat in the water and watch it sail.



Would you like to test the controls of the boat?
Keep the rudder centred for a straight movement.
Now try turning the rudder from side to side and see what happens.