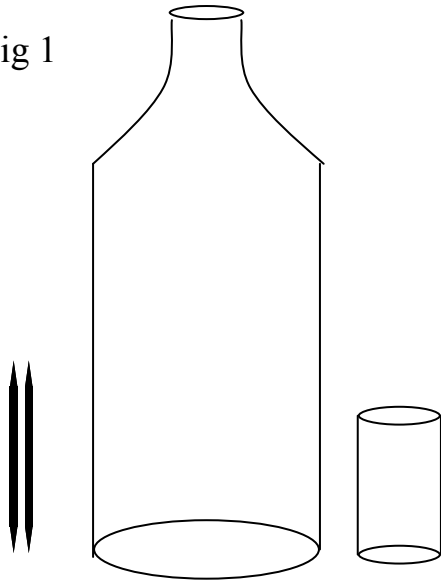


Build Your own Water Turbine

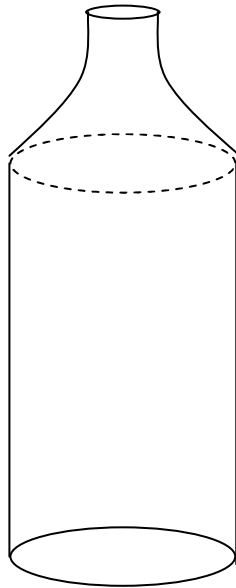
Fig 1



Materials: 2 ltr Soda Bottle, Bottle Cork and Two Cocktail Sticks

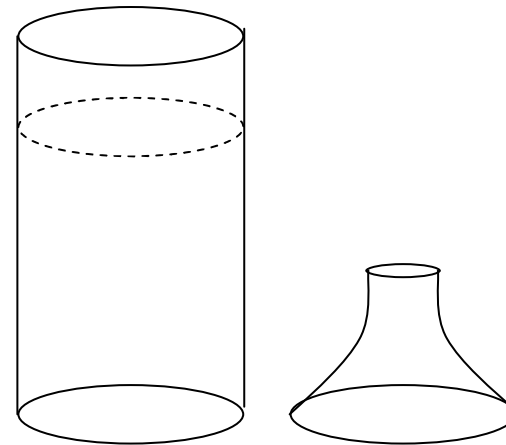
Equipment: Craft Knife and Safety Pin (to be used under adult supervision), Pen and Metal Ruler

Fig 2



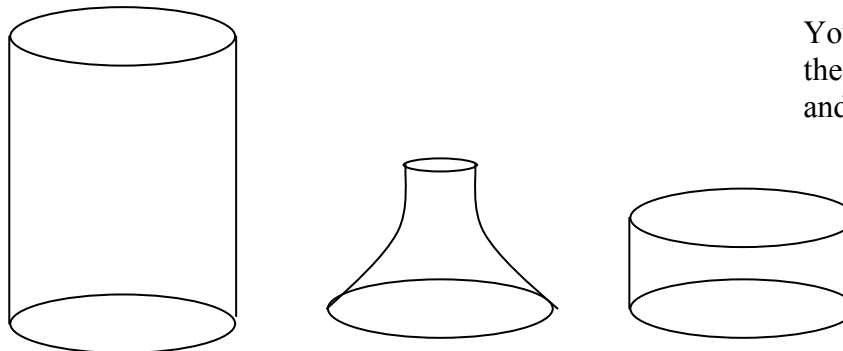
Take your soda bottle and carefully cut off the top with a craft knife

Fig 3



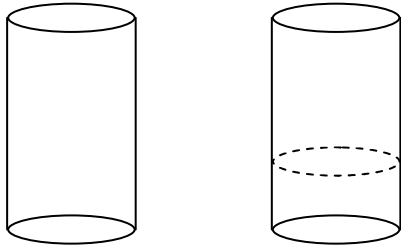
Cut a 4cm band from the top of the remaining bottle using the craft knife

Fig 4



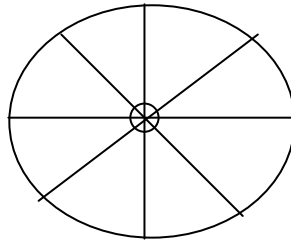
You will now have the base of the bottle, the top of the bottle and a 4cm plastic band.

Fig 5



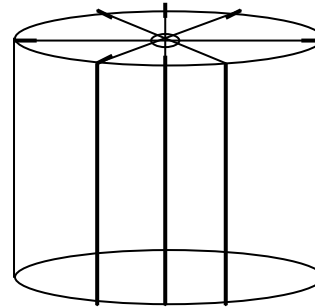
Take the Cork and cut to a length of about 3cm using the craft knife.

Fig 6



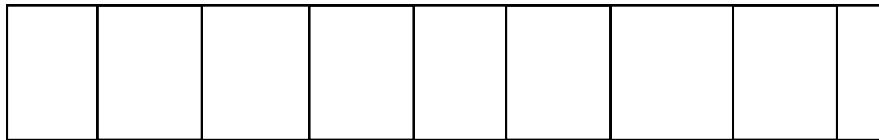
Using the pen mark the centre of the 3cm cork at both ends. At one end mark the cork dividing it into 8 segments

Fig 7



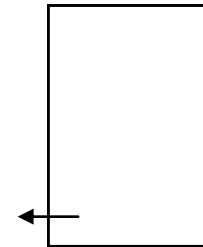
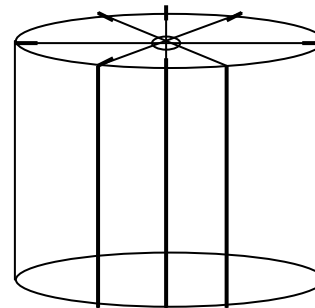
From each segment mark guide lines down the side of the cork with the pen. Using the craft knife cut 5mm into the cork at each segment and cut down the cork following the guide lines

Fig 8



Open out the plastic band cut from the bottle and neatly trim so it is 3cm wide then cut into 3cm lengths.

Fig 9



Take one 3cm length of plastic and carefully slide into the cork along each segmented cut. See Figs.10 and 11. Repeat for each segment.

Fig 10

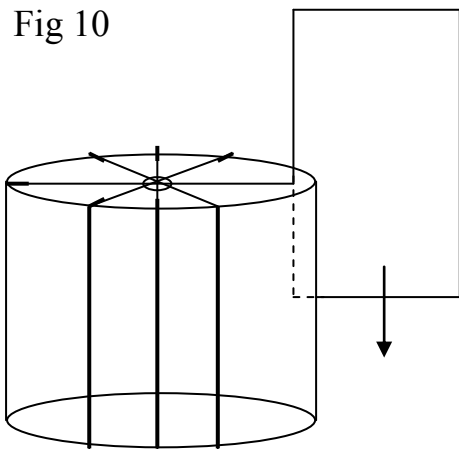
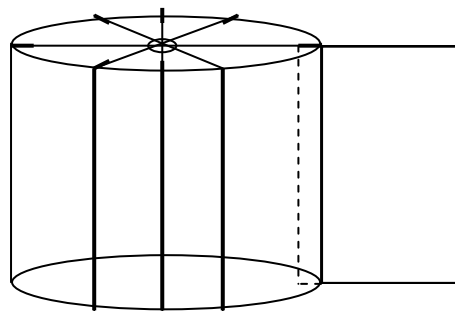


Fig 11



Note: Each 3cm square of plastic will have a natural curve. When sliding them into the cork make sure each one curves in the same direction

Fig 12

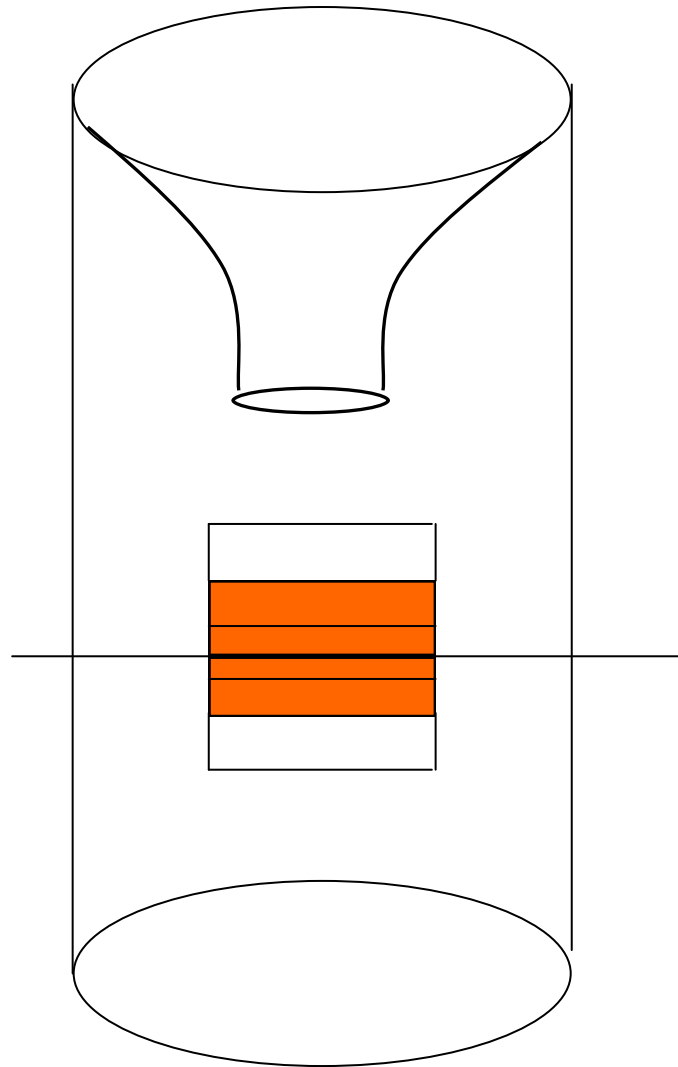
Using the safety pin prick a hole into the side of the lower part of the bottle about 10cm from the base. Do the same on the opposite side. Open up the holes so the cocktail sticks run freely in the holes

Feed each cocktail stick through one hole in the bottle and into the centre of the cork turbine. The turbine should run freely when spun with your fingers.

Take the top of the bottle and insert into the bottle up side down so it acts as a funnel. The funnel may be turned so you can alter the direction of water flow.

You now have your turbine.

Pour water into the funnel and direct its flow over the turbine.



Ideas:

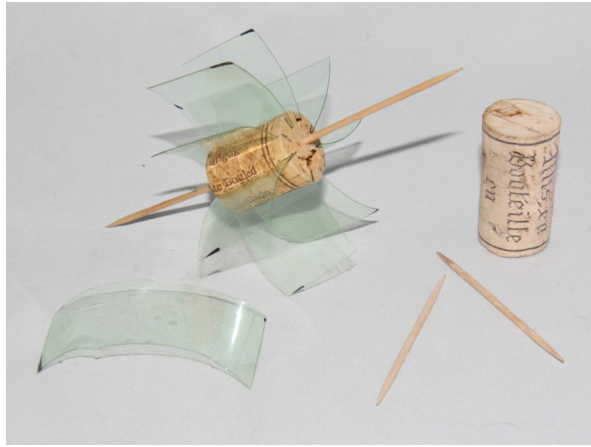
You may wish to modify its design so water flows out of the bottle rather than having to keep emptying the water when full.

You could even cut the bottom off the turbine bottle and position it horizontally in a length of gutter

Tie a piece of cotton to the cocktail sticks and find out how much it can lift.

Even try modifying the design and use only six turbine blades

Can you work out the maximum size turbine that could be fitted into the bottle?



Cork Turbine and the materials used to make it. Notice the natural curvature of the plastic turbine blades



Craft knife being used to cut into the cork. Again observe the natural curvature of the turbine blade material



Close up of the craft knife cutting into the turbine cork and the centre point and segment markings. Notice how the knife only cuts 5mm into the cork



The complete turbine. A green funnel has been used from another bottle to show its positioning.