



# MAKE YOUR OWN HOVERCRAFT



## Equipment

- 1 Old CD
- 1 Balloon
- 1 Pop-up top from a drinks bottle
- Glue or packing tape
- Material to decorate your Hovercraft (e.g. white paper and markers)



## Background Information

Push a CD across a flat table, what happens?  
The CD slows down and then stops. Why?

The surface of the CD and the surface of the table rub against each other with a force called friction. Friction is a force that tries to stop objects from sliding over each other. Smooth objects can slide over each other more easily than rough objects. You can slide across a timber floor more easily in your socks than in your school shoes, because the sole of your socks are smoother than the soles of your school shoes. Try this, rub your hands. What do you notice? (*Your hands feel hot due to friction*). Rub soap on your hands. What do you notice? (*Soap reduces friction- i.e. makes your hands more slippery*). Hovercrafts can travel over both water and land because they move across a layer of air. Hovercrafts are often used as passenger ferries.

We will make a Hovercraft using the above equipment.

## What to do

1. Take the pop-up bottle top in your hand and carefully cover the rim of the large circular end of the top with the glue.
2. Place the top, as accurately as possible, over the hole in the centre of the CD. Allow the glue to set. Children's craft glue will take a few hours to dry. Stronger glue will dry more quickly but needs an adult to apply it as we don't want fingers stuck together.

If using packing tape to stick the pop up top onto the middle of the CD, make sure the base of the top is surrounded with the tape as it needs to be airtight.

3. Stretch the balloon over the bottle top.
4. Decorate the top of the CD by sticking white paper to it and creating your own design on it.
5. Inflate the balloon by blowing through the hole at the base of the CD.
6. Pinch the neck of the balloon to stop the air from escaping. Keep your hand on the neck of the balloon.

Well done, you have now made a Hovercraft.





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<b>Let's test it</b>	<ol style="list-style-type: none"><li>1. Carefully place the Hovercraft on a smooth flat table.</li><li>2. Take your hand away from the neck of the balloon and gently push your Hovercraft.</li></ol>
<b>What happens?</b>	The Hovercraft glides along the top of the table a much greater distance than the cd did on its own.
<b>Why?</b>	<p>The air escapes from the balloon out underneath the CD.</p> <p>The force of this air is strong enough to lift the CD slightly off the surface of the table. The friction between the CD and the air is much less than between the CD and the table.</p>
<b>Further tests</b>	<ol style="list-style-type: none"><li>1. Measure how far your hovercraft will travel on different flat surfaces e.g. concrete, tiles or carpet.</li><li>2. Estimate, and then measure, how far the Hovercraft travels when you vary the amount of air in the balloon.</li></ol>
<b>Is friction a good thing?</b>	<p>Yes – if there was none we would be slipping and sliding all over the place (<i>like on ice</i>). You could not walk if there was no friction between your shoes and the ground, and a car would skid all over the road if there was no friction between the tyres and the ground.</p> <p>No – when parts of machinery rub together they can get very hot and wear away, so you need to reduce the friction. How? By using OIL (<i>or sometimes BALL BEARINGS – see DPSM activity 'Friction – Slip or Stick' under 'Energy and Forces'</i>), or in this activity A CUSHION OF AIR.</p>