

# The Hovercraft

(A Change In States Of Matter Experiment)



**Time**

5—10 min per demo  
+ class discussion

## WHAT YOU'LL NEED

(Provided in Primary Science Pack)

✓ Blue Gloves

✓ Dry Ice



**Always replace lid on dry ice box immediately after use.**

**You will also need:**

✓ Smooth Tabletop

✓ Paper/fabric towel

This experiment covers part of the statutory requirement for children to observe that some materials change state when they are heated.

## BACKGROUND

This demonstration illustrates friction and change of state. Dry ice changes from a solid to a gas - when placed on a table this gas makes a film that allows the dry ice to float across a smooth flat surface like a hovercraft. Students can participate in keeping the piece of dry ice on a table provided they know not to pick the dry ice piece up. Either they wear thin plastic gloves or move the dry ice with a ruler or book, (a bit like table hockey!). If the dry ice falls on the floor instruct the students to let it stay there and not pick it up – it will evaporate to gas in minutes.

## What To Do



The demonstrator selects one decent size piece of dry ice from the box using the blue gloves supplied using the scoop. Put the lid back on the box. Using a paper towel (or similar) to grip the piece of dry ice rub vigorously on a tabletop for about 10 seconds. This will create a flat surface on one side of the dry ice cylinder. Invite the class to gather round the table whilst you gently push the dry ice across the surface. It will travel with minimum effort floating on a tiny cloud of invisible gas. If safety issues are satisfied you can invite some of the class to gently push the ice across the table so that they can judge how easily it glides.



Picture courtesy of St Hilary's School, Godalming

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### What's Happening?



Dry ice is changing from a solid to a gas, this process is called 'subliming'. The CO<sub>2</sub> gas from the solid provides a small layer of gas between the tabletop and the flat side of the dry ice greatly reducing friction between these two surfaces. It is the heat from the tabletop that is causing the dry ice to sublime. It follows that if the table top is very cold the dry ice piece will not glide as well.

Consider devising a method to do this in a bigger way using pellets. We haven't managed this yet, but it would be impressive to show students

how to slide a book, for example, across a desk! We will credit any suggestions on our website...

### Make this an experiment



To turn this demonstration into a true experiment ask the junior scientists to answer these questions:

- **How could you make the hovercraft work better/worse?**

### Teachers' notes

Using the equipment supplied and following these instructions means that the demonstration is very safe – as always please read the safety information on dry ice provided with these downloads and available on [chillistick.com](http://chillistick.com)

Change the temperature of the surface, hotter will mean more sublimation and lower friction. Colder will mean the opposite. You could test this by chilling down part of the surface using some dry ice, and then launching the hovercraft at this patch. The cold section should cause the dry ice piece to slow down or stop, like brake.

Engineers and scientists are constantly working to reduce friction in machinery of all types to save on material and energy costs.



Picture courtesy The Greyhouse School, Hartley Witney