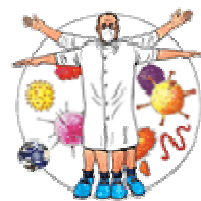


HOW TO MAKE MAGIC IN THE KITCHEN



You will need:

Large glass bowl
Small Pyrex bowl or jug
At least 250ml of vegetable oil

How to do the experiment:

- 1 – Pour the vegetable oil into the large glass bowl until it is filled a couple of inches from the bottom (NOTE – you will be able to reuse the oil afterwards).
- 2 – Take the Pyrex bowl or jug and dip the edge into the oil. What happens?

Why did this happen?

When the Pyrex is placed in oil, it seems to disappear.
Can science explain it or is it just magic?

Light travels at different speeds in different materials: in air it travels quickly and in glass it travels significantly slower.

As a result, light must slow down when it moves from air into glass.



If the light is entering the glass at an angle, it will not only slow down but also change direction.

A similar effect can be seen when driving the left wheels of a radio-controlled car into some soft sand: the left wheels slow down and make the car veer to the left.

The veering and bending of light as it moves from air into glass makes the world behind the glass appear distorted. Hold the glass bowl up and take a look through and you'll see that everything looks all weird.

But rather than your brain thinking that the world is *actually* distorted, it interprets the distortions as an object in the way – in other words, it sees the otherwise transparent bowl.

So in short, light travelling at different speeds and bending light are the only reasons we can distinguish the transparent Pyrex from the equally transparent air.

So why does Pyrex disappear in oil?

Well it just so happens that light travels at the *same speed* in vegetable oil and Pyrex.

This means that when light moves from one into the other, it has no reason to bend and thus carries on in a straight line.

When the light reaches your eye there is no way of knowing that it travelled through any Pyrex. With nothing to distinguish between where one ends and the other begins, your brain can't work out where the bowl is.



If your brain can't see it, then the bowl becomes invisible. Ta daa!

Read more about the BA Festival Of Science 2006 on the BBC Where I Live website for Norfolk at **bbc.co.uk/norfolk**. Here you will find more Kitchen Sink Science from the Naked Scientists to try at home.

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