

Professor Brainstorm's Vanishing Reflection

About this Activity (Information for Parents and Teachers)

This experiment explores how light reflects off different surfaces. It is also used to explore the difference between a **reflection** and the fact that all surfaces **reflect** light.

This experiment is designed for children aged from 7 to 11 years (Year 3 to Year 6).

What you Need

- A chopping board or a piece of stiff piece of card
- Kitchen foil

How to make a Mirror

You can use a piece of kitchen foil to make a simple mirror as follows:

- Tear off a piece of kitchen foil - being careful to make sure that the foil doesn't get any creases in it as you tear it off.
- Stretch the foil over your chopping board (or card), making the card as smooth as possible.

Now hopefully you should have something which make a reasonable mirror. If you look in to it, you might not be able to tell that the reflection is really you - but you should at least be able to see a face looking back at you.

In the photograph below is a picture that I have taken with my foil mirror. Can you identify the objects that are reflected in the mirror? (The full picture is on the next page.)





The objects are an orange, a banana and an apple. Did you guess any of them correctly?

OK, so our mirror is not perfect

Vanishing Reflection

- Remove the foil from the chopping board and crumple it up slightly. (Be careful not to rip the foil.)
- Now stretch the foil out again on the chopping board, trying to make it as smooth as possible. Can you see your face in it now?

On the left is a photograph that I have taken with the crumpled foil. I don't think you would recognise any of these objects from their reflection in this mirror.

How does it work? (This is the science bit)

All objects **reflect** light - not just mirrors. In these pictures, sunlight is shining on to the orange - and some of that light is reflected from the orange to our eyes - which is how we are able to see the orange.*

However, a mirror is a special example because it is a very smooth surface. When light is reflected off the mirror, all of the light is reflected in the same direction, so it produces a **reflection**.

When we crumple up the kitchen foil, the surface is no longer smooth - no matter how carefully we try to flatten it down again afterwards! The foil still reflects light (and the fact that it is so bright and shiny in comparison to the other objects in the picture shows that it is reflecting a very large proportion of the light), but because the surface is no longer smooth, the light is reflected in lots of different directions, so it doesn't produce a reflection.

* All objects reflect light. Apart from things which are sources of light, every object that we see, we can only see because of the light that it reflects. For more about how objects reflect light, try the What's In The Box experiment.

Now try this ...

Where else can you find reflections.

- Look around for hard smooth surfaces in your home. You may be able to see a reflection in some hard plastic surfaces. Or in a china mug. Or in shiny kitchen cabinet doors.
- You can see reflections in a CD or DVD - or the screen of your mobile phone.
- Outside, you may see reflections in a pond or a lake. But you only get a good reflection if there is no wind. Even a gently breeze creates tiny waves on the surface, which destroy the reflections - just like the crumpling of our kitchen foil destroyed our reflection.

