

Chapter 16

Bending Light

Getting started

Light travels straight through many things such as air, water, glass — even the emptiness of space. We can see through these things as light passes through them. Sometimes when you see something through glass or water, it looks different. Let's find out why.

A. Check what you will need.



Experiment Time!

B. Look at the pictures and fill in the blanks.

Use the words in brackets to help you.



1. Half _____ a _____
with _____.
(water, jar, fill)



2. _____ a _____
into the _____.
(water, ruler, Put)



3. Now _____ carefully at the
_____ from a number of angles.
(ruler, look)

C. Prediction

What do you think you will see? _____

Now do the experiment.

What happened? _____

D. Experiment results

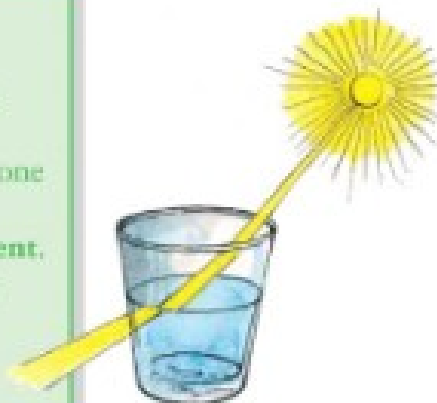
1. The part of the ruler in the water looked _____ the part sticking out of the water.
(the same as, different to)
2. The part in the water seemed _____ the part sticking out.
(thinner than, thicker than, the same as)
3. The whole ruler looked _____.
(straight, bent, happy)

E. Now answer the following questions.

1. Could you see through the water? _____
2. Could you see through the glass jar? _____
3. Could you see through the air around the glass jar? _____
4. Did the water change the way the ruler looked in any way? _____
5. Describe the change. _____

FACT BOX 1

Light travels really fast. It's the fastest thing there is. It travels through many things such as air, glass and water. The speed at which light travels changes slightly — just a little — if it moves from one thing to another, such as from air to water. It also changes direction. In other words, the light gets **bent**. This can change the way objects appear if we look at them through a mix of things such as through air and water. Objects can seem bigger or smaller than they really are.





FACT BOX 2

Did you ever notice that people look very short when they are standing in water? Light travelling from air into water gets **bent** and the picture carried to our eyes is changed. This makes people standing in water look shorter than they really are.

FACT BOX 3

We use many objects to bend light in order to make small things easier to see. Light travelling through the air bends as it passes through the lens of glasses or a magnifying glass.



FACT BOX 4

In warm countries, **archer fish** spit water at insects sitting on overhanging branches, knocking them into the water. They then eat them. Even though they are underwater, they are able to allow for the way light bends as it moves between water and air. They are very good shots!

