

NAME \_\_\_\_\_

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# Lovely lenses

In around 1300 someone in Italy (no one knows who!) found out how to grind glass to make lenses. The trick was getting the right shape – wanna know how it's done? Well, why not make your own? Go on, it's easy!

## Dare you discover ... how to make your own lens?

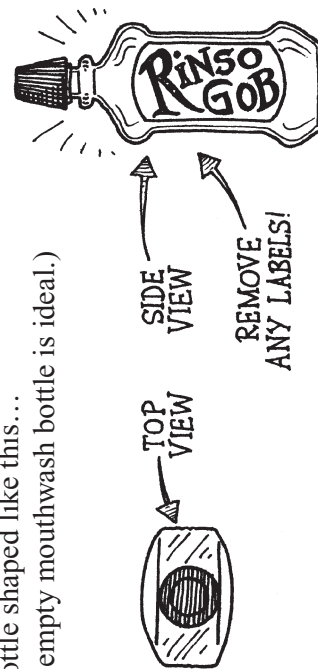
In the olden days you had to cut the glass carefully to shape and then grind it with gritty substances by hand until you had made exactly the right curve. And then you had to 'polish' it to get rid of any scratches. (Basically, this meant grinding the glass some more with fine powders.) This grinding might take days of toil.



But you'll be pleased to know there's an easier way...

## What you need:

A bottle shaped like this...  
(An empty mouthwash bottle is ideal.)

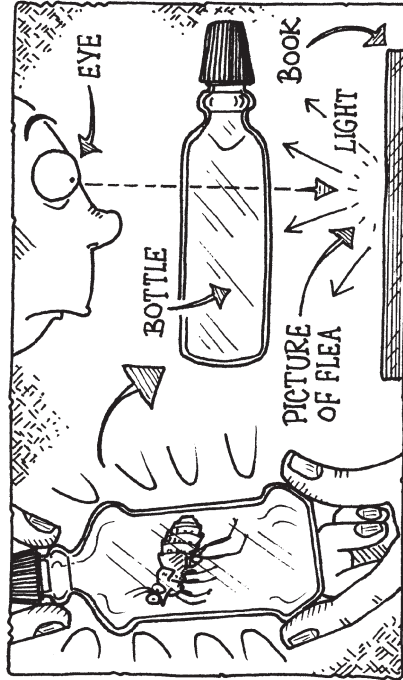


## What you do:

- 1 Completely fill the bottle with water so there are no air bubbles.
- 2 Place the bottle sideways on over this sheet, put your eye close to the bottle and look at this fascinating blood-sucking flea.



You should be able to see that the flea has got bigger – but how? Here's a clue: you have to imagine light bouncing off the page and bouncing into your eyeballs.



Which of these explanations is correct:

- a) The light speeds up as it passes through water and this makes your brain think the flea is bigger than it is.
- b) The water bends the light towards a point. If I put my eye at this point I can see the flea close up.
- c) The water makes the light brighter and this makes my brain think that the flea is bigger.

- Now use your lens to look at the objects in your Observatory. What do you notice?