



Half term 'HAVE A GO' activity!

Diver in a bottle

All divers sink to the bottom of the ocean so that they can see the fish or explore old wrecks. Investigate!

You can send a **pen cap** to the bottom of the bottle just by squeezing the bottle. It floats to the top again when you let go. (Just like a diver!)

You will need:

A beaker

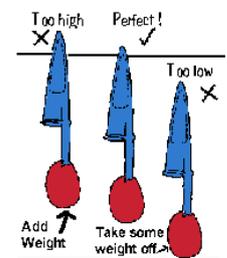
Modelling clay / bluetack

A pen lid (without a hole in the top or fill the hole with clay)

A clear, plastic bottle

Water

1. Fill the beaker with water. Put a blob of modelling clay on the long spike of the pen top to make it float and so that it is hanging straight down in the water with the tip at the surface. Add or take away clay until you have it just right.



(If you haven't got this type of pen top, make a ring of clay around the end of the cap so that it is balanced and floats vertically in the water.)

2. It's best to do this part in the sink! Fill the bottle right to the top and then drop in the 'diver' (pen top). The water should be level with the top of the plastic. Screw on the lid.



3. Gently squeeze the bottle. The pen cap diver will immediately drop to the bottom of the bottle. Let go and it will float back up again.

Watch it RISE and FALL!

Top tip:

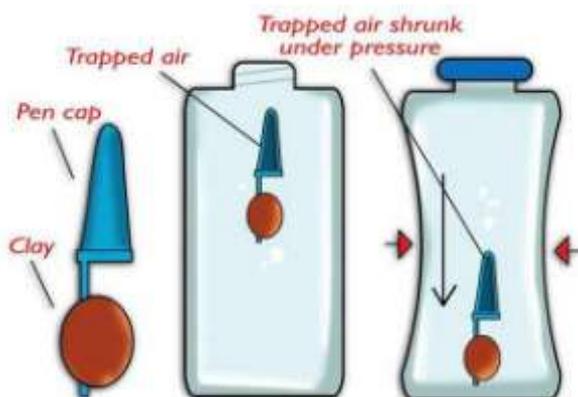
To make your diver more realistic, cut out a small diver figure (about the same size as the pen top) from a piece of foil tray. Attach him to the cap with a small paper clip. Test how the cap floats in the glass before you put him in the bottle, adding or taking away clay if you need to.



What do you see happening?

Why does it happen?

The science behind the magic:



Squeezing the bottle forces the water into the pen cap. This means that the diver is more dense, or heavier and it sinks. When the bottle is released, the water moves out of the pen cap. This means the diver is less dense (lighter) so it floats back to the top.

Would it matter if we changed the shape of the bottle or pen cap?

Does the temperature of the water make a difference?

Can the size of the pen cap alter the results?

Does changing how tightly I squeeze the bottle affect the speed that the diver moves?

Finally...

Take a **'I'm a scientist selfie'** with your experiment and **send** it to our squad of school science ambassadors:

sciencesquad@stocktonwood.liverpool.sch.uk