

Mermaid Diver

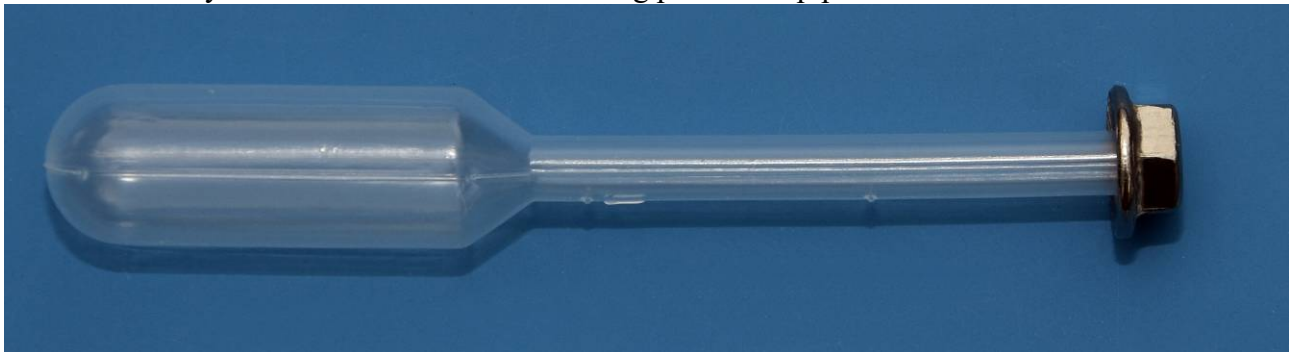
You will need:-

- 1 x clean and empty 1 or 2 litre clear plastic drinks bottle
- 1 x 1ml plastic pipette
- 1 x M5 nut
- Permanent marker pens
- Waterproof glue (e.g. UHU, hot melt)
- Pieces of cotton thread and thin plastic for decoration.
- Scissors.
- Water.

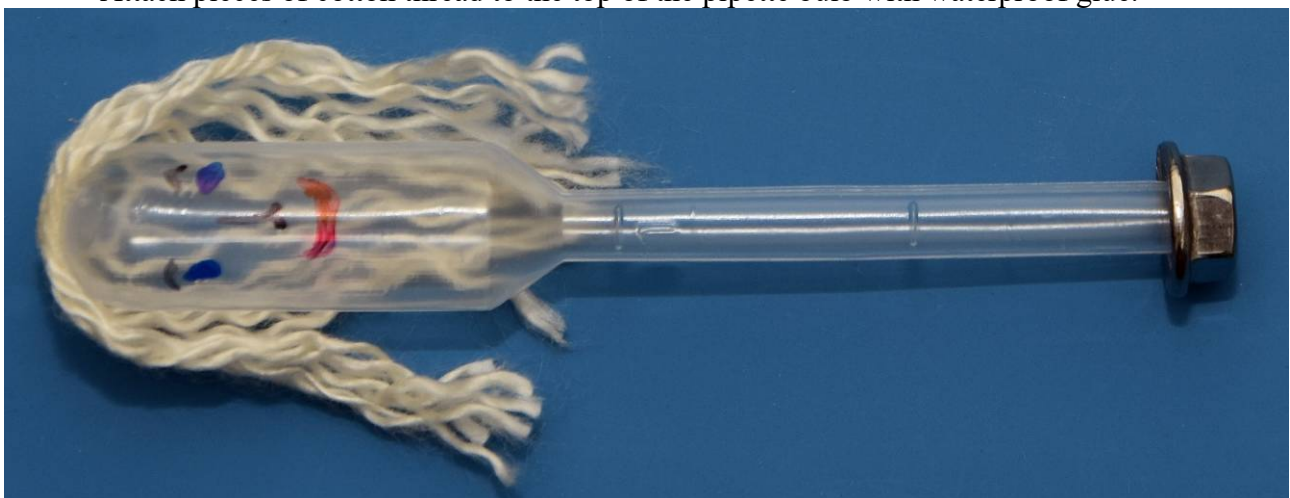
Construction



- 1). Take the pipette and cut off the stem at the 0.5ml mark.
Carefully screw the nut onto the remaining part of the pipette stem.



- 2). Using waterproof marker pens, add a face to the pipette bulb.
Attach pieces of cotton thread to the top of the pipette bulb with waterproof glue.



- 3). Thin pieces of plastic or cotton thread can also be attached just below the bulb to form 'clothes' for the diver.

- 4). The bulb of the pipette needs to be approximately half full of water. Putting the stem of the pipette into water and squeezing the bulb will suck some water into the bulb but not usually sufficient. To get more water into the pipette bulb, turn the pipette upside down, so that the bulb is at the bottom. Gently squeeze the bulb (some water will come out of the stem) and hold squeezed while putting the bottom of the stem into water. Releasing the bulb will suck more water into the bulb. This should be repeated until the bulb is approximately half full.

- 5). Testing the mermaid diver.
It is easiest to get most of the testing done before putting the diver (pipette) into the bottle.
Put water into a tall glass or bucket and add the diver.
The diver should just float upright - the very top of the diver's head should just break the surface of the water, as in the picture.
If the diver sinks, remove from the water, turn upside down, and press the bulb to push out some water. Then repeat the test.
If the diver floats too high, then repeat step 4 to add more water and repeat the test.

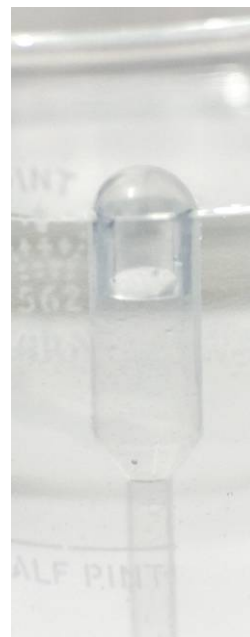
- 6). When the diver has been adjusted, fill the clear plastic drinks bottle with cold water.
(If tap water is used, dissolved air will be released from the water over the next few days, but will eventually clear.
If boiled water that has been allowed to cool is used, then all of the dissolved air will have been removed.)
Carefully add the diver to the bottle making sure that no water is pushed out of the pipette.
Screw the cap tightly onto the bottle, and squeeze the bottle.
If all is correct, the diver should sink as the bottle is squeezed.

If the diver does not sink, then more water needs to be added to the pipette. Repeat step 5.

If the diver is set up when the temperature is cold, then as the water warms up, the diver may sink to the bottom and stay there.

This can be cured by releasing the cap on the bottle and retightening.

The picture shows the diver just beginning to descend when the bottle is pressed. The red 'skirt' is made from a plastic bag which contained fruit and is tied with cotton just below the bulb of the pipette.



How it Works

Water compresses very little when pressurised. When the bottle is squeezed, water is forced into the bulb of the pipette and compresses the air. This makes the density of the diver increase until it is greater than the water and so the diver sinks. When the bottle is released, the compressed air in the pipette bulb pushes water out of the pipette, reducing the density of the diver, and so the diver rises.