

# ! WARNING:

This instruction manual contains important information and should be retained for later use.

NOT SUITABLE FOR CHILDREN UNDER 3 YEARS DUE TO SMALL PARTS WHICH MAY PRESENT A CHOKING HAZARD.

## Instructions:

If glycerine is accidentally ingested, or contact causes symptoms, in case of doubt seek medical advice without delay. Take the chemical together with the container with you. In case of injury always seek medical advice.

## Safety rules :

1. Do read these instructions before use, follow them and keep them for reference.
2. Do keep young children, animals and those not wearing eye protection away from the product when in use
3. Do store out of reach of young children
4. Do make sure that all containers are fully closed and properly stored after use.
5. Do wash hands after using the product
6. Do not eat, drink or smoke when handling the product & components
7. Do not allow chemicals to come into contact with the eyes or mouth
8. Do not replace foodstuffs in the original container
9. Dispose of container properly after use

**Handcare:** after use, rinse hands thoroughly. If you have damaged or sensitive skin, avoid prolonged contact with the bubble solution.

Glycerol should be used according the instructions. Please observe any safety warnings & advice on the bottle label before use & retain for reference in case of accidents. Should any accident occur please follow the first aid advice below:

## Eye Contact:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Check for and remove any contact lenses. Get medical attention if irritation persists.

## Skin Contact:

Wash with soap and water. If skin becomes irritated, cover with an emollient. Get medical attention if irritation persists. Cold water may be used.

## Inhalation:

If inhaled, remove to fresh air. In the unlikely event that breathing difficulties result, oxygen may be given. If not breathing, give artificial respiration & get medical attention immediately.

## Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Should the patient be unconscious do not give anything by mouth. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear or persist.

# Mega Bubble

science museum uk

## What does it do?

Mega Bubble lets you produce soap bubbles big enough to fit a person inside.

## How does it work?

The ring in the Mega Bubble kit is dipped into bubble solution and then lifted out quickly. The "skin" of the solution sticks to the ring as you lift it, creating a soapy tube connecting the ring to the liquid below. The surface of a bubble is being stretched by the air inside, so it is trying to squeeze the air into the smallest shape possible – a sphere. You'll never get corners on a single bubble. If you move it fast enough air pressure will detach the film from the ring and the tension in the surface of the film will make it close around on itself, trapping some air inside to make a spherical bubble.

## Did you know?

Most liquids have "surface tension" at their top layer, which causes that layer to behave like a stretchy skin. In the case of water the surface tension is too strong to support a thin film – small amounts of water are snapped back into individual droplets too quickly. Adding soap weakens the surface tension just enough to let a stable film develop, which is the first step to making bubbles.

## Try it Out

Look at the surface of the bubbles you make. Can you see any colours? Light is reflected off both the inner and outer layers of the soap film. The film's thickness is similar to the wavelength of light, so if white light is shone on the film, some colours are cancelled out by interference. Light is made up of waves, and white light is a mixture of many waves of different colours that we perceive as white when they are combined. If, for example, the thickness of the film is the same as half the wavelength of blue light, blue light reflected from the front and back of the soap film will be precisely cancel out and you will see yellow. The skin of a bubble thins as gravity pulls down on it, and as it dries out, which you can see as moving colour patterns on the surface.

## Fact files

You are following a long tradition. Seventeenth century Flemish paintings show children blowing clay pipes. In the nineteenth century, a painting by John Everett Millais called 'Bubbles', showing a child blowing a bubble pipe, was used for advertising by the Pears Soap Company. Today, bubble solution and blowers are among the top selling toys in the world, with hundreds of millions of bottles sold each year.

## National Curriculum coverage

This product is suitable for exploring science at KS2 and KS3 of the National Curriculum. Use it to discover more about Light and Waves (physical processes).

## In the Science Museum

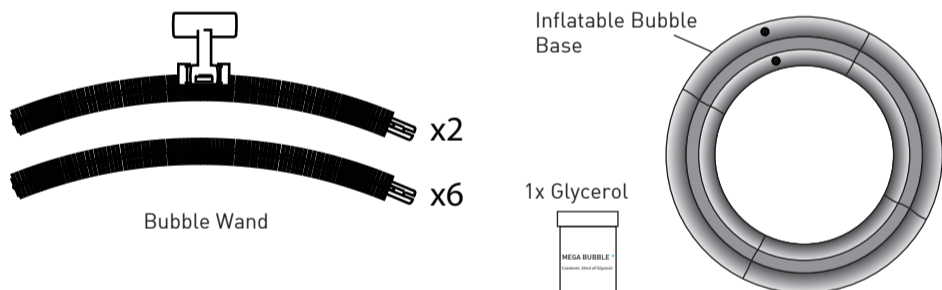
In the Launchpad gallery you can see regular bubble shows by the team of Explainers, and there is large bubble-film exhibit which was the inspiration for the Mega Bubble.



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## Parts Index



## Setting Up

### Assembling the Bubble Wand

1. The bubble wand is made up of 8 pieces that need to be slotted together. Firstly, identify the two wand pieces that have handles on them and leave them to one side. We need these in a moment.
2. Join three of the remaining wand pieces together as shown in the diagram. Repeat this process so you have two sets of wand pieces.
3. Now, attach the wand pieces with the handle on them to the rest of the pieces to form a circle (see Fig 1). The two handles should be directly opposite each other.

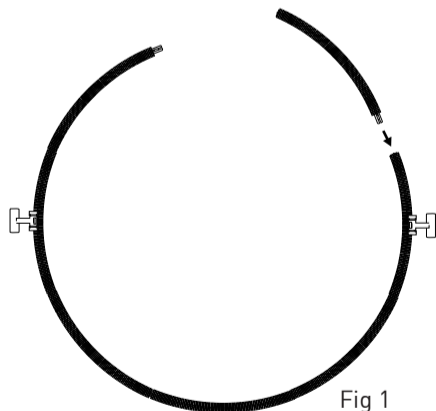


Fig 1

## Setting Up

### Inflating the Bubble Base

1. The Bubble Base has two chambers that need to be filled with air.
2. Remove the caps on each valve and inflate each chamber until it reaches full capacity (Fig 2). Note, during storage the bubble base may have become creased. To flatten the base, place books or similar objects on top of base, which will then flatten after 5-10 minutes.
3. Always place the side with air valves face down on the ground.
4. Always place a plastic sheet or newspaper under the base and ensure it extends to at least 50 cm around the outer edge, as some water spillage is inevitable. Set-up indoors.

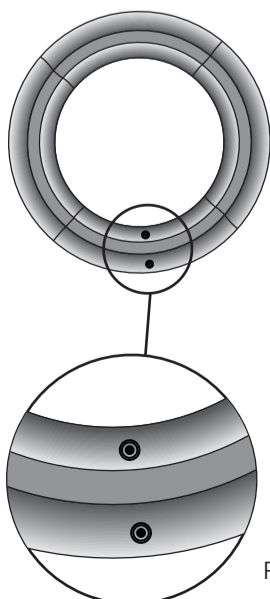


Fig 2

## Setting Up

### Making the bubble solution

1. This pack comes with 25ml of glycerol. To make the bubble mix add this 25ml of glycerol to approx. 40ml of a washing-up liquid (see below) and 1250 ml of water. This is a ratio of 152: 3: 5 (water: glycerol: washing-up liquid), and can be used to make up various amounts of solution as required.
2. Simply mix these ingredients up in a bowl and pour into the reservoir inside the Bubble Base (Fig 3). It is easiest if solution is poured in using a small container to prevent spillage.  
Note: Glycerol is available to buy at most good pharmacies where it is often referred to as Glycerine.

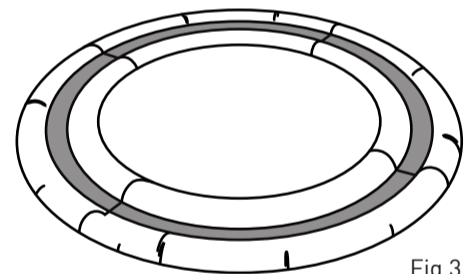


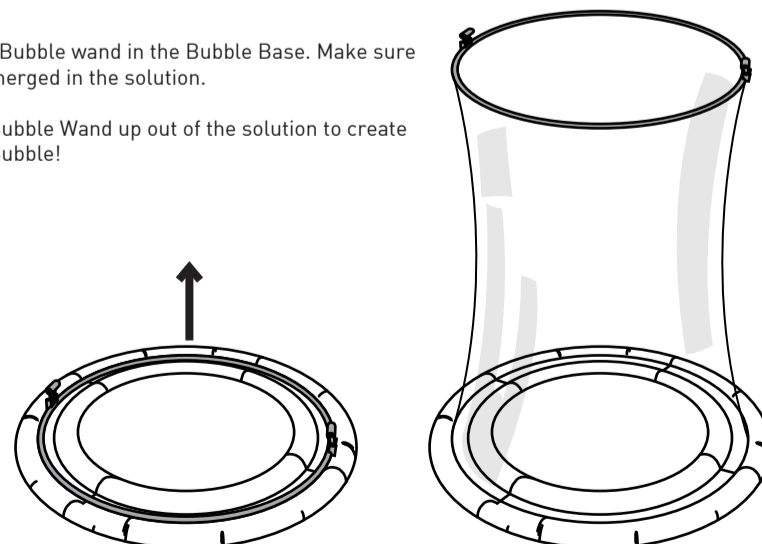
Fig 3

## IMPORTANT!

The bubble solution will not work if certain types of washing up liquid are used. The best bubbles are obtained by using any non scented washing-up liquid. Do not use lemon, lime and other scents. The bubble solution recipe provided has been formulated and tested by scientists at the Science Museum, but results will vary with conditions, exact ratios of solutions used and the environment. Have fun investigating what works best for you and see Further Tips section below.

## Operating the Mega Bubble

1. Rest the Bubble wand in the Bubble Base. Make sure it is submerged in the solution.
2. Lift the Bubble Wand up out of the solution to create a Mega Bubble!



## Note:

For further enjoyment of the Mega Bubble, try experimenting with the direction you draw the wand up from the base. Use it to create any number of amazing shapes!

## Further tips

For the best bubbles, use in a humid environment, hence avoid air conditioned areas and if necessary spray a fine mist in to the air using a hand water spray device. Using warm water improves bubble formation, so try adding some warm water to make up your bubble solution. Before making bubbles wet the surrounding inflatable rubber ring base with the bubble solution.