

# MAKE YOUR OWN 3D HOLOGRAM



# YOUR CHALLENGE!

Using an old magic technique and an empty pop bottle, let's create our own 3D holograms at home!

## You will need:

Plastic bottle  
Craft knife or scissors  
Clear tape

Pen  
Ruler  
Smartphone

Is it a ghost  
or is it  
technology?



**SAFETY FIRST!**  
If you are using a  
craft knife always cut  
away from your body  
and keep your  
fingers clear of the  
blade!

## What to do:

### STEP 1:

Using your craft knife or scissors, cut off the neck of the bottle just below the lid. Cut the rest of your bottle in half just below the label - throw away the bottom half of the bottle.



### STEP 2:

Flatten the bottle length-ways so it folds in half, and then again so it folds into quarters. Cut along the folds so you have 4 equal pieces of plastic.



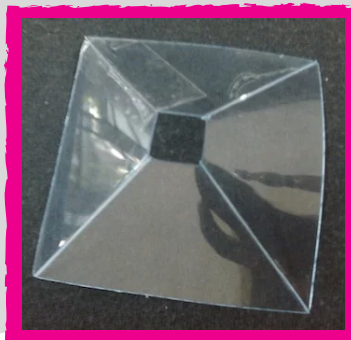
### STEP 3:

Using the template on the next page, or a pen and a ruler, draw and cut out 4 trapezoid shapes from the bottle pieces.



### STEP 4:

Use the clear tape to stick the 4 plastic trapezoids together in a pyramid shape.



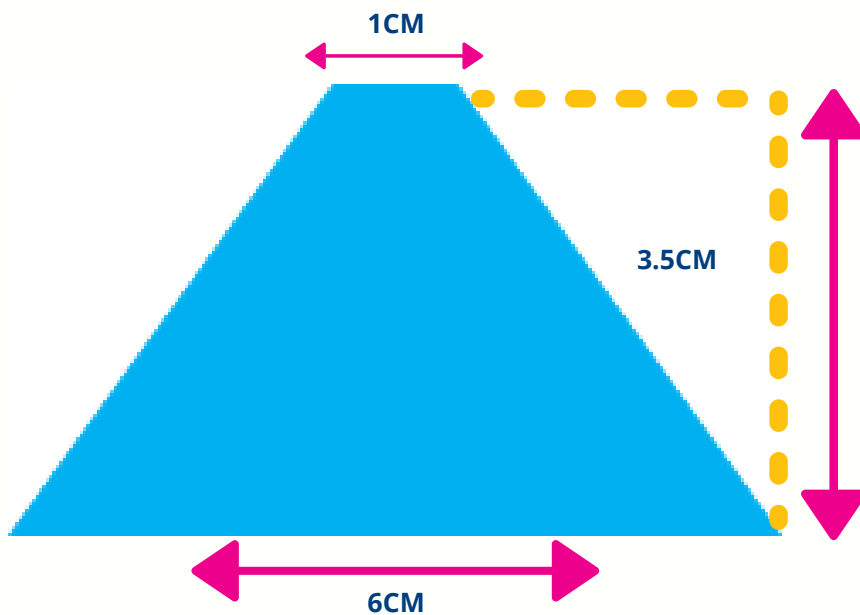
### STEP 5:

On your smartphone search for 3D Hologram on YouTube. Place your plastic pyramid in the centre of the video, play the video and turn off the lights!

# NOW FOR THE SCIENCE!

Four symmetrically opposite variations of the same image are projected onto the four faces of the pyramid. By principle, each side projects the image falling on it to the center of the pyramid.

These projections work in unison to form a whole figure, which creates a 3D illusion.



Can you double or triple the trapezoids' dimensions to create a larger hologram?

Try using a 2 litre drinks bottle and tablet instead of a phone.

## IN THE REAL WORLD

- Our 3D hologram works on the principle of PEPPER'S GHOST.
- This is an illusion technique originally used by magicians to create ghosts, and is now used in theatres, theme parks and museums worldwide.
- Using large flat mirrors rather than small pieces of plastic, an image can be projected for viewers.
- This technique is used in Walt Disney World's ride *The Haunted Mansion* to create the illusion of ghosts for visitors.

## EXPLORE FURTHER

For more resources and videos search for the following:

BBC Bitesize Light Refraction

Musicians, holograms and Peppers Ghost