

# Which Balloons Pop?

(Belgium)

## Background

White objects look white because they reflect all the wavelengths of light that shines on them. Black objects absorb all wavelengths of light that shines on them.

Coloured objects, on the other hand, reflect only some of the wavelengths and absorb the rest. So if you see a green balloon, it's reflecting green light and absorbing light in the red and blue regions of the visible light spectrum.

## You will need:

- ✓ Balloons – black, green, red and white.
- ✓ Powerful green laser 303 with focus lens (Available online at [aliexpress.com](http://aliexpress.com))  
Focus = +/- 15 cm

## Follow these steps:

1. Inflate a black, white and green balloon to approximately the same size.
2. Attach each balloon to a cup using Sellotape so that the balloons stay in place.
3. Aim the laser pointer at the black balloon. Record what happens.
4. Aim the laser pointer at the white balloon. Record what happens.
5. Aim the laser pointer at the green balloon. Record what happens.



6. Aim the laser pointer at the red balloon. Record what happens.

**Tip:** Sometimes, the laser only burns a small hole in the balloon. When this happens, the balloon slowly releases the air from inside the balloon and does not pop. To overcome this, you should press on the balloon to get a higher internal pressure while shining the laser at the balloon.

## So what happened?

- When the green laser is aimed at the;
- Black balloon - the black balloon pops. It pops because the black balloon absorbs the green laser light. That absorption gets converted into heat.
- White balloon – the white balloon does not pop as it reflects the green light.

- Green balloon – the green balloon does not pop as it reflects green light.
- Red balloon – the red balloon pops as it absorbs the green wavelengths of light.

## What next?

- Draw a large black dot onto the white balloon, and aim the laser at this dot. Notice what happens.
- Repeat the experiment using a powerful red laser. What happens the green and red balloon?

# Can you burst a balloon inside another balloon?

(Belgium)

## Background

Transparent materials allow most light to pass through whereas opaque materials block most light from passing through.

## You will need:

- ✓ Black balloon
- ✓ Transparent clear balloon
- ✓ A Hand balloon pump
- ✓ Pencil
- ✓ Magnifying glass
- ✓ Sunlight

## Follow these steps:

1. Push the deflated black balloon inside the transparent deflated balloon using a pencil.
2. Remove the pencil and inflate the black balloon to approximately half size.
3. Tie a knot in the neck of the black balloon and push the knot of the black balloon into the neck of the transparent balloon.
4. Inflate the clear balloon to approximately full size, so the black balloon can move freely inside the clear transparent balloon.



5. Using a magnifying glass, concentrate the sun's rays through the transparent balloon onto one spot on the black balloon.
6. Record what happens.

## So what happened?

The black balloon popped while the outer transparent balloon stays inflated. The transparent outer balloon allowed the sun's rays to pass through. The black balloon absorbed the sun's rays causing the balloon to

heat up. The heat caused the bonds of the black balloon to weaken until it could no longer contain the air on the inside.

## What next?

Change the colour of the internal balloon. What colour balloon takes a longer time to pop and what colour balloon takes a shorter time to pop?