



LAB 3

The mystery of the
bursting balloons

LET'S GET GOING!

What do we need?



MATERIALS

- White balloons
- Black balloons
- Different coloured balloons: green, blue, red, yellow, etc.

INSTRUMENTS

- Magnifying glass
- Stopwatch
- Sunglasses

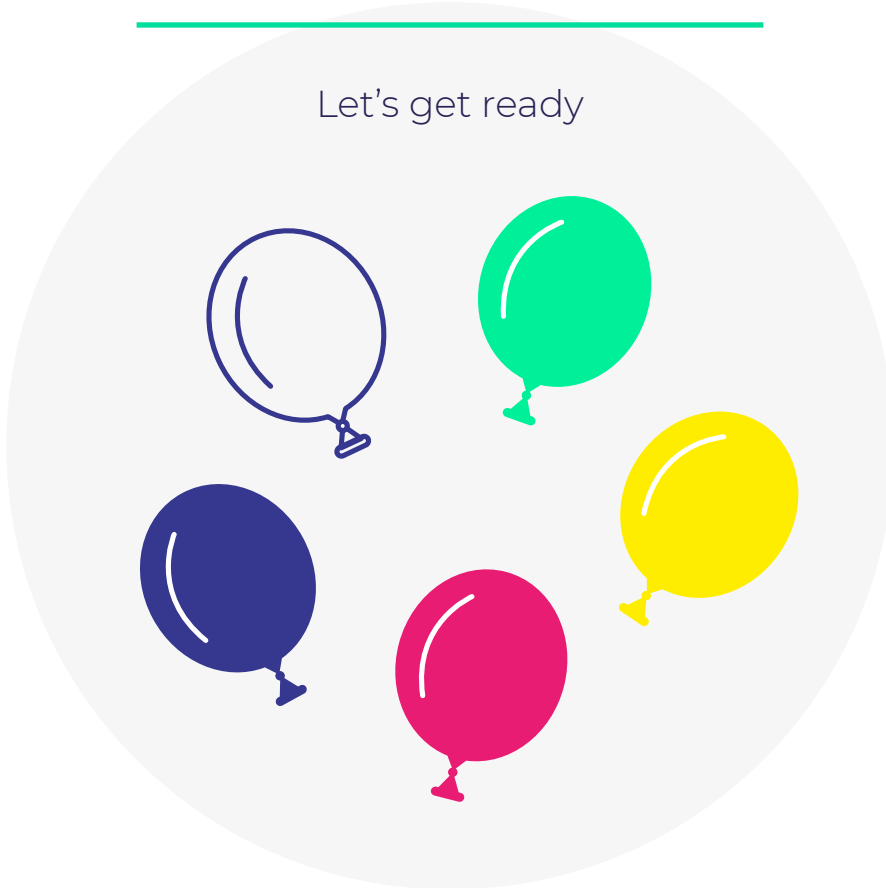


SAFETY MEASURES

- Never look directly at the sun while doing the experiment.
- If you do the experiment on a day when the sun is very strong, it is important that the people handling the balloons and the magnifying glass wear sunglasses. The point of light concentrated on the balloon is quite strong; although it is not dangerous to a person's health, it is best to use sunglasses.

PHASE 1

Let's get ready



- 1 / Blow up the different coloured balloons until are about 25 cm long.
- 2 / When you have blown up the balloons, think about the sunlight around us and ask yourself some questions to start you thinking about the experiment you are going to do.

PHASE 1

What colour is sunlight?

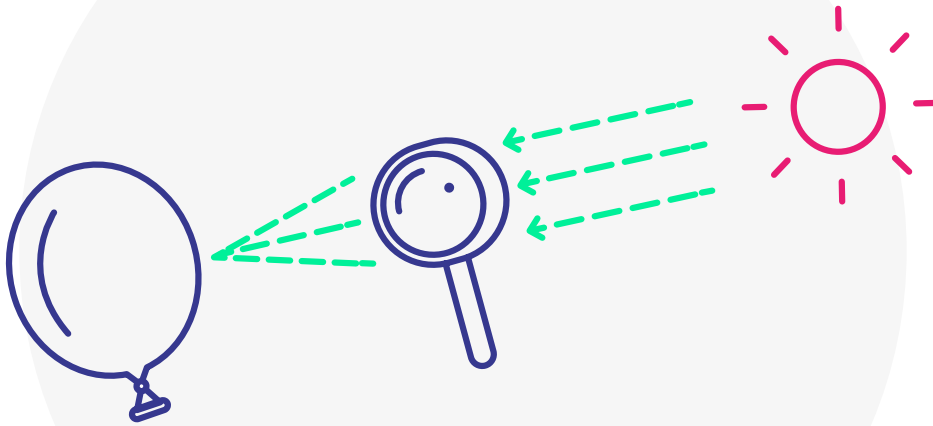
SPACE FOR ANSWER 

Why do we see the balloons as different colours if they are all lit by the same sunlight?

SPACE FOR ANSWER 

PHASE 2

Which balloons burst and when do they do it?



- 1 /** For this experiment to work, you need sunlight. So you need to go into a playground or find a window or door letting in the sun's rays.
- 2 /** One person in the team will be in charge of timing, another will hold the magnifying glass and the balloon and someone will note down the time it takes to burst. The team's tasks can be rotated for each balloon as the experiment is repeated.
- 3 /** The person holding the balloon and the magnifying glass must always wear sunglasses.
- 4 /** Repeat the same procedure for each balloon:
 - Put the balloon somewhere it receives the sun's rays.
 - The person with the magnifying glass must place it between the sun and the balloon so that it is parallel to the surface of the balloon and perpendicular to the sun's rays.

PHASE 2

- To get the rays properly focused, the person in charge of the magnifying glass must put it very near to the balloon and then gradually move it away.
- As the magnifying glass moves away from the surface of the balloon, the rays of light passing through it are concentrated in a point.
- When all the light is concentrated in a point, the person holding the magnifying glass says “now” and the person in charge of timing starts the stopwatch and runs it until the balloon bursts.

5 / Once the balloon has burst, note down the time it has taken in the boxes you have below and move on to the next balloon. Repeat point 4 until you have noted the times for all the balloons.

<input type="checkbox"/> Black balloon:	___:___:___	<input type="checkbox"/> Coloured balloon:	___:___:___
<input type="checkbox"/> White balloon:	___:___:___	<input type="checkbox"/> Coloured balloon:	___:___:___
<input type="checkbox"/> Coloured balloon:	___:___:___	<input type="checkbox"/> Coloured balloon:	___:___:___

PHASE 2

Have the balloons that have not burst changed in any way?

SPACE FOR ANSWER 

Make a list of the colours of balloon in order according to the time they have taken to burst. If you have repeated the experiment with different equipment, compare lists. Which order is repeated in all cases?

SPACE FOR ANSWER 

PHASE 3

The energy in light

- 1/ Once you have done the experiment, you need to find out the relationship between the sun's rays and the fact that the balloons burst. Start by asking what happens to us when we are in the sunlight.

What similarities are there between sunlight and a flame?

What role could the light hitting the balloons play in the result of the experiment?

SPACE FOR ANSWER 

PHASE 3

What role does the magnifying glass play in the experiment?

SPACE FOR ANSWER 

- 2 /** We still have one question to answer: why have some balloons burst before others? To find out the answer we need to look at the relationship between the light on the objects and the colour we see they are.

Why do we see some objects as red and others as blue if they are all lit by the same sun?

SPACE FOR ANSWER 

SOLVE THE MYSTERY!

Science has helped us see something
our eyes hadn't noticed before!
Now it's time to solve the puzzle.

**WHAT INVISIBLE PHENOMENON HAS MADE THE BALLOONS
BURST AT A DISTANCE?**

SPACE FOR ANSWER 

