



LAB 1

Catch the light!

LET'S DO IT!

What do we need?



MATERIALS

- ☐ A bag of transparent orbeez that you will find in the Welcome Pack
- ☐ 0.5 l glass
- ☐ 2 l glass container (e.g. food container)
Both containers can be smaller but a large size facilitates observing the phenomenon.
- ☐ Water
- ☐ Flour
- ☐ A transparent glass or bottle

TOOLS

- ☐ Laser pointer of any colour (1mW or less)

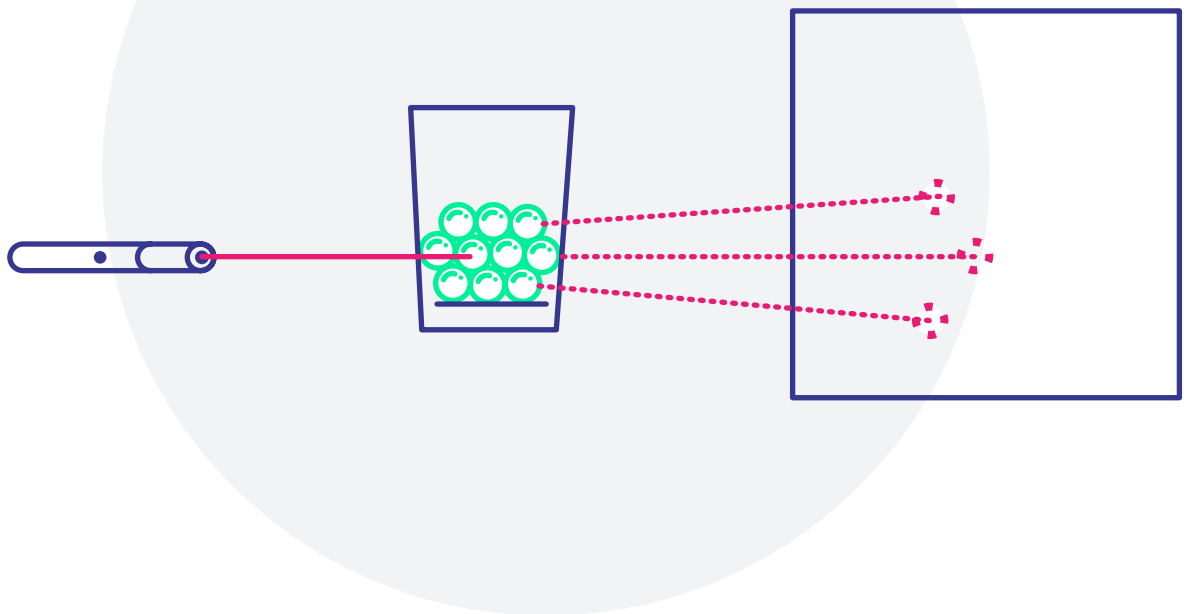


SAFETY MEASURES

- ☐ This experiment must be carried out under the supervision of an adult.
- ☐ Do not throw orbeez down the drain.
- ☐ Do not point the laser at a person's face or eyes. Be careful with surfaces like mirrors, whiteboards or smooth walls that may make laser light bounce unexpectedly!

PHASE 1

DIVERTING LIGHT: THE PHENOMENON OF REFRACTION



- 1 /** Put the orbeez into water for 24 hours so that they get hydrated, absorb the water and increase their size (follow the manufacturer's instructions).
- 2 /** Pour the orbeez into a 0.5 l glass.
- 3 /** Place the glass with the orbeez on a table and near a wall (if possible, a white wall).
- 4 /** Turn off the classroom lights and shoot the laser at the orbeez and towards the wall.
- 5 /** Observe what happens to the laser light.
- 6 /** Then add water.
- 7 /** Turn off the lights and shoot the laser again. Observe what happens.

PHASE 1

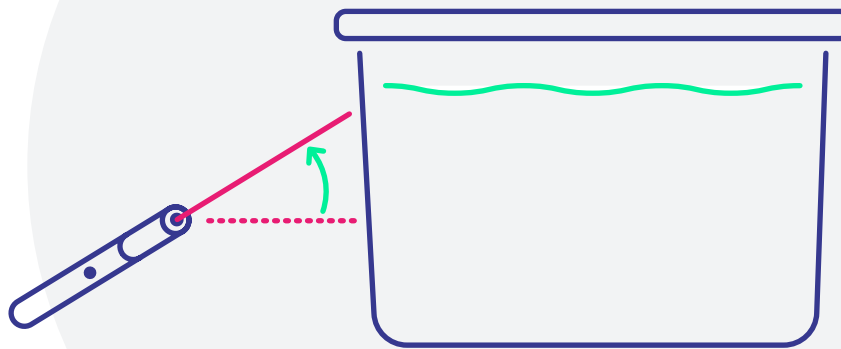
Why is the laser light diverted when there is no water in the glass with the orbeez?

Why isn't the laser light diverted after adding water to the glass with the orbeez?

WRITE THE ANSWER BELOW 

PHASE 2

TRANSPORTING LIGHT: THE PHENOMENON OF REFLECTION



- 1/ Fill the glass container with water.
- 2/ Turn off the classroom lights.
- 3/ Shoot the laser from one of the container sides at a 90° angle with the side wall of the container.
- 4/ Then change the entry angle of the laser light by pointing it towards the water surface.
- 5/ Observe what happens.

***NOTE:** It is possible that the laser light cannot be sufficiently distinguished inside the water. To be able to see it better, we can add particles to the water which divert the laser light, such as 0.25 g of flour per every 2 l of water. Another option to see the laser light better is to try adding other types of particles and change their proportion.

PHASE 2



Draw the route that the laser beam followed
inside the water in the container.
Why does it bounce and stay inside the water?

WRITE THE ANSWER BELOW



LET'S SOLVE IT!

With this experiment we have understood the properties of light that allow us to transport it from one place to another.

At the ALBA Synchrotron we use these properties to transport the light we generate at the accelerator to the stations where experiments are carried out.

**DO YOU KNOW WHAT MATERIAL IS USED TO
TRANSPORT LIGHT FROM ONE PLACE TO ANOTHER AND
ALLOWS US TO HAVE HIGH-SPEED INTERNET AT HOME?**

WRITE THE ANSWER BELOW

