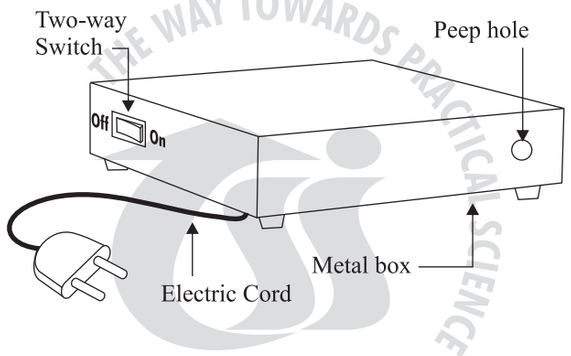
Reflection & Transmission

Observe two objects at a single place !!!

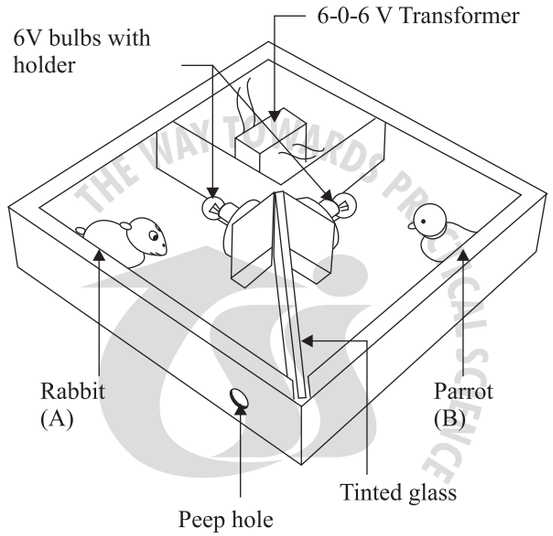
Assembly :

Consists of a metal box (of size 8" x 8" x 1.75"). One wooden rabbit and another wooden parrot are fixed diagonally opposite to each other inside the box. 6V electric bulbs are with holders are fixed in front of rabbit & parrot. These can be switched on and off alternatively using two-way switch provided at one side of the box (as shown in figure). A 6-0-6 V transformer is used in the assembly. AC mains cord is connected to the input end of transformer and output ends of the transformer are connected to the two bulbs and switch.

A tinted glass plate is mounted along the other diagonal of the box between the rabbit and the parrot as shown in the next diagram.



INSIDE VIEW OF METAL BOX



To do and observe :

Step 1 :

Place the apparatus on the table. Connect the power lead to the mains supply and switch on. As soon as you switch on one of the lamps will glow.

Step 2:

Peep through the hole provided to the box. You will observe the parrot or rabbit depending on which bulb gets on. Now you switch the two way switch on other side you will observe the rabbit at the place of parrot or parrot in the place of rabbit.

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What is going on ? :

Transparent objects transmit light to the maximum extent. They do reflect light to some extent. Absorption of light is comparatively very less.

The tinted glass which is inside the box will exhibit almost 50% reflection and almost 50% transmission properties.

Initially, when you switch on the mains, the two way switch is at one position. Let us assume that the bulb in front of the parrot is on. As a result you will see parrot. This is seen by the transmitted light passing through the glass plate. When you turn the switch on the other side, the bulb in front of the rabbit will glow and the bulb in front of the parrot will be off. Now you will see rabbit. This is due to the light reflected by the glass plate. Since the glass plate is at an angle of 45^0 to the rabbit and parrot, the reflected image of the rabbit will be formed at the position of the parrot.

Followup :

Observe a window glass, you will see a faint image of yourself. Why?

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THE WAY TOWARDS PRACTICAL SCIENCE

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REFLECTION & TRANSMISSION

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