

Chapter 29: Reflection and Refraction**Multiple Reflections**

78 Pepper's Ghost

Purpose

To explore the formation of mirror images by a plate of glass

Required Equipment/Supplies

safety goggles
 two candles of equal size, in holders
 1 thick plate of glass, approximately 30 cm × 30 cm × 1 cm
 2 supports for the glass plate
 matches

Discussion

John Henry Pepper (1821–1900), a professor in London, used his knowledge of image formation to perform as an illusionist. One of his illusions was based on the fact that glass both reflects and transmits light.

Procedure



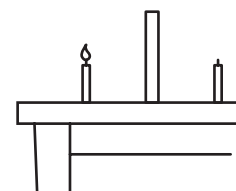
Step 1: Put on safety goggles. Light one candle, and place it about 6 cm in front of a vertical thick glass plate. Place a similar, but unlighted, candle at the position on the other side of the glass plate at the point where the flame of the lighted candle appears to be on the unlighted candle.

1. How does the distance from the lighted candle to the glass plate compare with the distance from the glass plate to the unlighted candle?

Step 2: Look carefully, and you should see a double image of the candle flame.

Find double image.

2. How would you explain the double image?



Find multiple images.

Step 3: Look at the glass plate such that your line of vision makes a small angle with the surface of the glass. You will see three or more “ghost” images of the candle flame.

3. Explain these “ghost” images.
