

## EXPERIMENT-2

OBJECT: To show that lateral displacement of a ray of light takes place when passing obliquely from one medium to another using a glass slab.

APPARATUS: Board, Glass block, pins, paper.

THEORY: When a ray of light passes from one medium to another obliquely, it bends. This phenomenon is called refraction.

When a ray of light passes from an optically rarer medium to an optically denser medium, the ray of light bends towards the normal.

When a ray of light passes from an optically denser medium to a rarer medium, the ray of light bends away from the normal.

METHOD:

1. Secure a plain sheet of paper in a landscape position on the board with the help of pins.

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2. Place the glass block on the centre of the paper and trace its outline.
3. Remove the glass block and label the corners of the rectangle as ABCD starting anticlockwise from the top left and corner.
4. Mark a point 2cm from point A and name it E.

5. Place a protractor at point E and mark angle HEG 90 degrees and angle of incidence angle HEG = 30 degrees. Extend the line GE as a broken line so that it touches the line CD and goes slightly beyond.

6. Place two pins on the line EH at least two centimetres apart and name it 1 and 2. Ensure that the pins are vertically placed with reference to the board.

7. Place the glass block on the outline and place pins on the side ED such that all four pins are in the same straight line.

8. Remove the glass block.

9. Remove pins one at a time starting from pin 4. Circle the position of the pin immediately on remaining the pin.

10. Join the points 3 and 4 to touch the

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**OBSERVATION:**

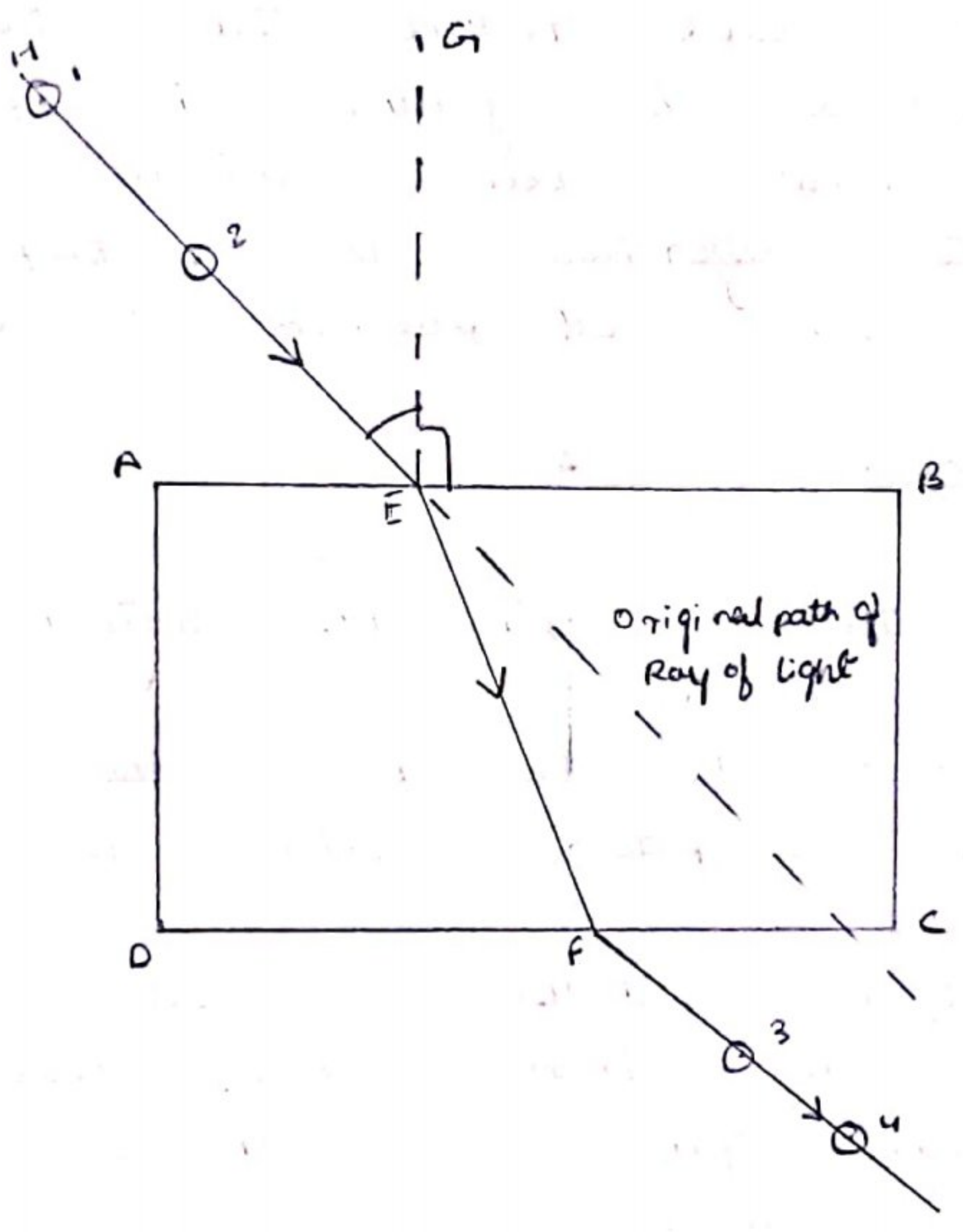
We will observe that the emergent ray obtained by joining the points 3 and 4 has been laterally displaced due to refraction as compared to the line EH produced.

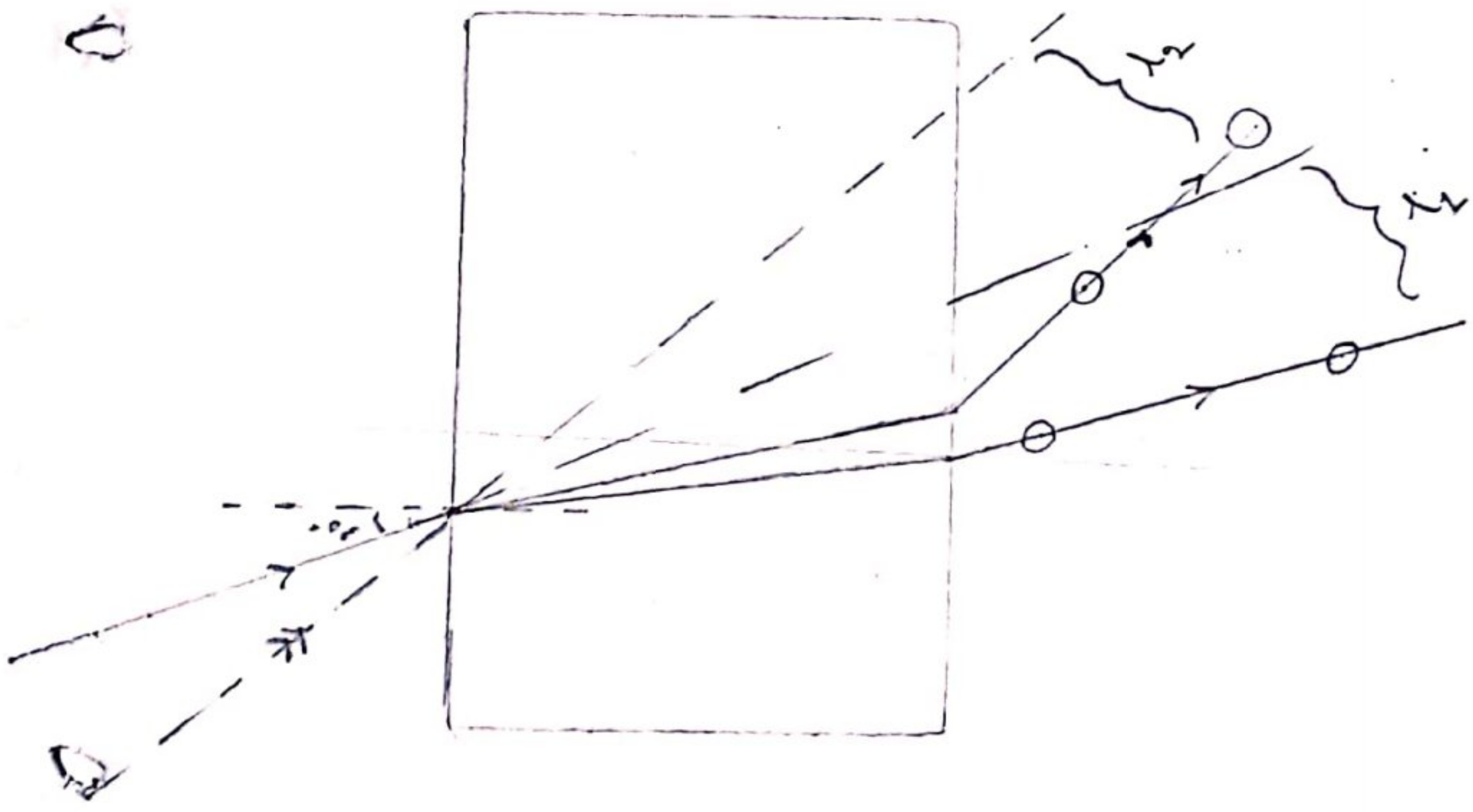
**PRECAUTIONS:**

1. Ensure that the pins are vertically placed on the board.
2. Ensure that the glass block does not move after it is placed before planting pin number 3.
3. The eye level must be at the level of the glass block while ensuring that the pins are in the same straight line.

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$$l_1 = 2.4 \text{ cm}$$
$$l_2 = 4.9 \text{ cm}$$



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OBSERVATION TABLE

| No of observation | Angle of incidence (in degrees) | Angle of refraction (in degrees) | Lateral displacement (in mm) |
|-------------------|---------------------------------|----------------------------------|------------------------------|
| 1                 | 30                              | 25°                              | 24                           |
| 2                 | 40                              | 35°                              | 35                           |
| 3                 | 50                              | 45°                              | 49                           |
| 4                 | 60                              | 53°                              | 50                           |

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EXPERIMENTAL TABLE

