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Group #2

6th/7th

01/29/14

The Convex Lens Lab

Conducted on 01/24/14

**PHYSICS STANDARDS:**

4f. Students know how to identify the characteristic properties of waves: interference (beats), diffraction, refraction, Doppler effect, and polarization.

**LAB STANDARDS:**

1a, 1b, 1c, 1d, 1e  **PIRATE WAY:**

Technologically Competent

**PURPOSE:**

To study the formation of images by a convex lens, screen support with screen under varying conditions.

**HYPOTHESIS:**

**PROCEDURES:**

1. Determine the focal length of the lens. Standing in a shady area, direct the lens at a very distant, well-illuminated object and adjust the lens until an image is projected on the index card screen. The distance between the lens and screen should be the focal length of the lens.
2. Using a light source, examine the image formed on the screen for each of the five scenarios:
3. Light source is more than 2F from lens
4. Light source is at 2F from the lens
5. Light source is between F and 2F from the lens
6. Light source is at F
7. Light source is between the lens and F
8. Record all data and fill out the data table provided in lab sheet.

**DATA:**

***f* = 17.4 cm**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Position of object (cm) | Position of lens (cm) | Position of image (cm) | do  (cm) | di  (cm) |
| 11.4 | 60 | 87.2 | 48.6 | 27.2 |
| 26.6 | 60 | 97.1 | 33.4 | 37.1 |
| 21.4 | 50 | 95.6 | 28.6 | 45.6 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1/d0 | 1/di | 1/do + 1/di | 1/*f* | ho (cm) | hi (cm) | do/di | ho/hi |
| 0.0206 | 0.0368 | 0.0574 | 0.0575 | 8.4 | 5.3 | 1.787 | 1.585 |
| 0.0300 | 0.0270 | 0.0570 | 0.0575 | 8.4 | 4.9 | 0.900 | 1.714 |
| 0.0350 | 0.0220 | 0.0570 | 0.0575 | 8.4 | 4.4 | 0.627 | 1.909 |

**ANALYSIS:**

1. The image created was formed outside the optical bench and was found lower than the meter stick.
2. The light rays coming from the distant object will be almost parallel, and all parallel ray that passes the convex lens will meet up at the focal point. When the screen is placed at the focal point, an image of the distant object will form.
3. Camera – Case 3

Lighthouse – Case 4

Projector – Case 5

Magnifying Glass – Case 1

**CONCLUSION:**