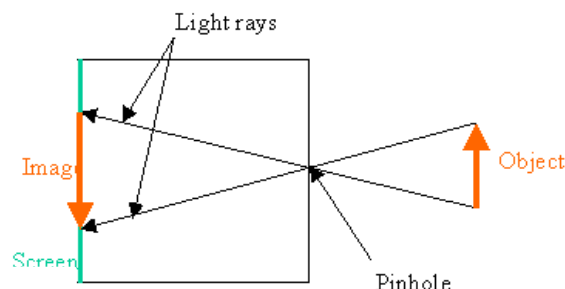


## 2S.6 Physics Optics (reflection)



### 1) Pin-hole camera:

- Light rays reflected off an object travels through the pin hole and forms an image on the screen
- The image is inverted due to the property of light: Light travels in a straight line



- $\frac{\text{Height of Image}}{\text{Height of Object}} = \frac{\text{Image Distance from Pin Hole}}{\text{Object Distance from Pin Hole}}$
- When the pin-hole is enlarged, the Image will become brighter but blurred. The image becomes blurred as the large pin-hole actually acts as many smaller pin-holes. Each pin hole forms its own image at a slightly different position. Thus, when the entire screen is observed, a blurred patch of light is seen. However, the image is brighter as there are more light rays entering the pin-hole camera
- When the pin-hole is made larger:
  - The image size does not change
  - The image becomes less sharp
- When the distance between the object and the pin-hole is increased:
  - The image becomes smaller
  - The image sharpness does not change

### 2) Laws of reflection:

- The incident ray, the reflected ray and the normal at the point of incidence all lie on the same plane
- The angle of incidence,  $i$ , is equal to the angle of reflection,  $r$

### 3) Properties of a the image of a reflected object

- Virtual (Cannot be captured on a screen)
- Upright
- Laterally inverted
- Same size as the object
- As far behind the mirror as the object is in front of the mirror

### 4) Drawing reflected light rays:

- Reflect the image behind the mirror
- Connect the image to the eye
- Connect the object to the point of intersection on the plane mirror
- Note: All lines behind the mirror must be dotted