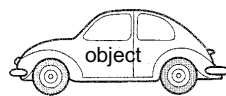
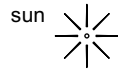
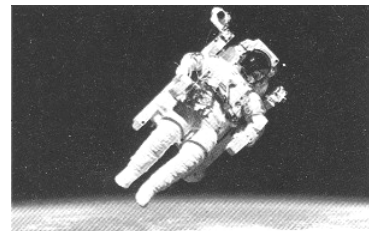


☞ Remember: Light rays are straight lines – so please use a ruler when drawing them!

1. How do we see an object? Explain the path travelled by the light rays, starting at the light source and ending at the eye. Depict the light rays in the picture below and explain in your own words. Please include also light rays that do not reach the eye.



2. Here's an astronaut in the sunlight. Explain why you can see him as well as the earth's atmosphere, and why space in the background is completely black.



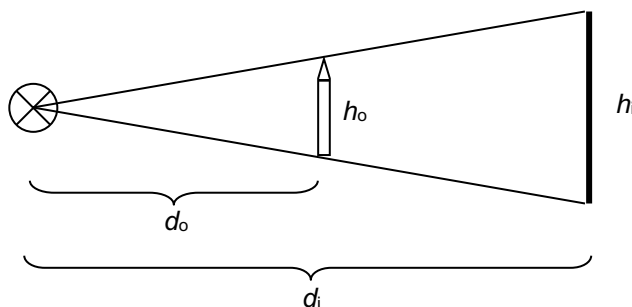
3. A pencil illuminated by a lamp casts a shadow onto the wall. We'll use the following symbols:

d_o : object distance

d_i : image distance

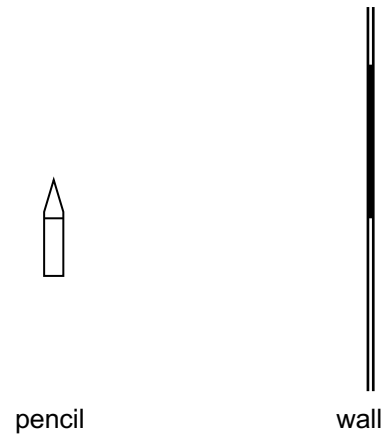
h_o : object height

h_i : image height

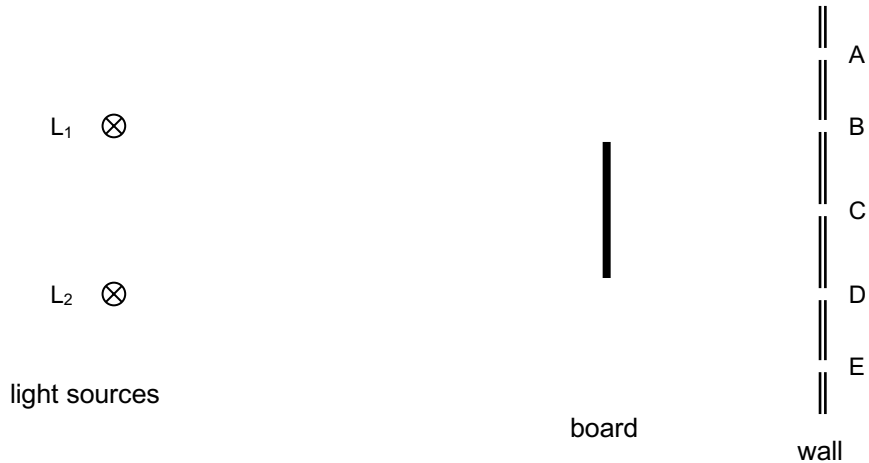


- a) What is h_i , if $d_o = 50$ cm, $d_i = 1.0$ m and $h_o = 18$ cm?
- b) What is h_i , if $d_o = 15$ cm, $d_i = 45$ cm and $h_o = 7.0$ cm?

4. Another pencil casts a shadow on the wall.
- Determine the position of the light source, sketching the light rays along the outline of the object.
 - There are two possibilities for doubling the size of the shadow without moving the wall. Find out what they are and draw them in the picture.



5. A board is placed between two light sources L_1 and L_2 and a wall.
- Sketch the shadow of the board.
 - Which light sources can be seen from A, B, C, D and E?



Solutions:

3. a) 36 cm

b) 21 cm