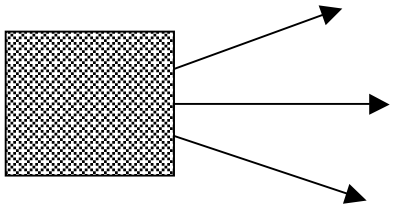
ILD 12

Name: _____

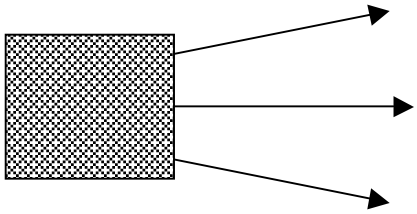
Working out what a model implies: Images

Directions: This sheet will be collected. Write your name at the top of the page. Follow your instructor's directions. It will not be graded, so write whatever you wish.

Situation 1: Suppose that you see some light rays emerging from behind a screen as shown. If you know the rays all come from a single light bulb, where would you guess that the bulb is located?

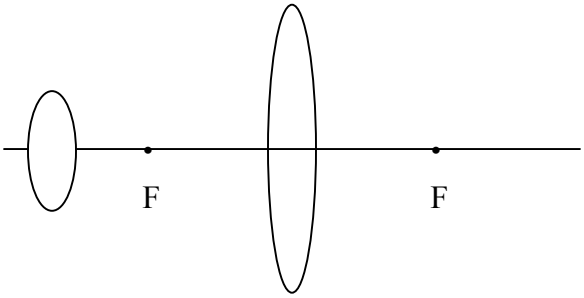


Situation 2: Again, you see light rays emerging from behind a screen and make a guess as to the location of the bulb. Where would you guess the bulb is located?



What could be behind the screen?

Situation 3: You now have a converging lens. A light bulb is positioned a distance larger than the focal length to the left of the lens, as shown on the right. Draw several rays from the top of the bulb and several rays from the bottom of the bulb to show how the image of the bulb is formed by the lens.



Is this a real or a virtual image?

Situation 4: What will happen to the image if the bulb is moved further away from the lens? Will the position of the image change? If so, how?

Will the size of the image change? If so, how?

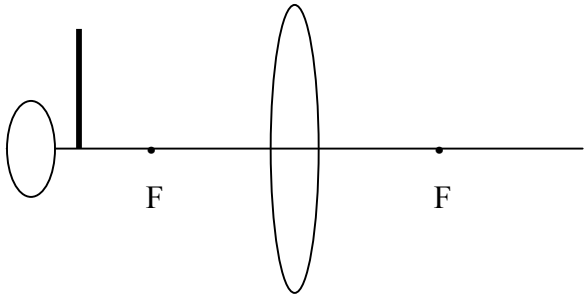
Will the image be real or virtual?

Situation 5: What will happen to the image if the bulb is moved closer to the lens (but is still further away than the focal point)? Will the position of the image change? If so, how?

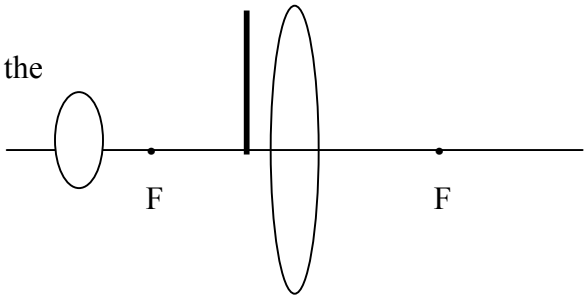
Will the size of the image change? If so, how?

Will the image be real or virtual?

Situation 6: What will happen to the image if you block the top half of the bulb with a card? Answer in words and show what happens on the diagram on the right by making any changes needed in the rays you drew above for Situation 3.



Situation 7: What will happen to the image if you block the top half of the lens with a card?
(a) First, give your "first impression" answer and the reasoning behind it.



(b) Next, look at the experiment. What did you see? How can you explain it?

(c) In part (a), many people have the common-sense idea that "just half the light gets through." Is that intuition hopelessly wrong, or can you refine it to agree with a correct explanation of what's going on here?