## Worksheet for Exploration 33.1: Image in a Flat Mirror



A bear stands in front of a plane mirror that is hanging on a wall. A point source of light is located near the mirror. You can drag this source

		to any location and can change the angle of its rays by click-dragging on the hotspot (position is given in meters and angle is given in degrees). Restart.
a.	the bear's eye is located at the adjust the rays so that one ray	st the bear look in order to see her feet? For simplicity and ease, assume ne tip of her nose. Hint: Place the light source on the bear's foot and y leaves the foot and is reflected to the tip of the bear's nose. The point nere the bear would have to look to see her foot.
	her nose. Would you expect	te the light source on the bear's foot and looked for a ray that reflected to a different answer if instead you had placed the light source on her nose ted to her foot? Why or why not? Try it if you are not sure.
b.	Move the bear to the position (a), what will she see?	x = 1.0 m. If the bear looks at the same spot in the mirror found in part
	Does this imply that she is ab she moves away from the mirr	le to see more, less, or the same amount of her body in the mirror when or?

Was the result what you expected? Most students think the bear will see more of herself as she moves backward. However, as you should have observed, the field of view remains the same as the bear moves backward so she sees exactly the same amount of herself. Why do you think most people make an erroneous prediction? What assumptions/experiences might people be drawing on that lead them astray in this situation?
In terms of the bear's height, how long must the mirror be for her to see her entire body?  i. You already know the lowest mirror location necessary to see her feet, use the previous methods to find where she must look to see the top of her head.
ii. Now find the difference in these two values to know the total length of mirror necessary.
iii. Now, how tall is the bear?
iv. Finally, express the mirror length in terms of the bear's height.