Name:_____

Physics 100

PLANE MIRROR LAB

Be sure to word process the writing portion of your lab. Also integrate your drawings into the text. If you use large drawings, fold them so that they can be unfolded easily. Be sure to answer the questions that lead each activity as well as the questions posed within the activity.

1. What happens to your image when you back away from a mirror?
   a. Look at your face in a small hand mirror held about a half a meter from your face. Move the mirror toward you and away from you. (Your head needs to be level. The mirror needs to be perpendicular to the floor).
   b. Sketch what you see when close and far. Do you see more, the same, or less of yourself when looking in the mirror?
   c. Create a ray diagram that proves what you observed in part "b". Explain how this diagram serves as proof of what you observed.

2. How much of mirror do you need to see your entire height???
   a. Stand about a meter away from a full-length mirror. (It's important for the mirror to be perpendicular to the floor.) Have a friend mark off how much of the mirror you need to see your height. Keep your head level and only move your eyes to direct your partner.
   b. Move back away from the mirror. What happens to the marks on the mirror?
   c. Measure the distance between the two sets of marks. Compare the amount of mirror that you need to see your height to your height? Approximately what percentage do you need?
   d. Make a ray diagram that proves your results above. Explain how this diagram serves as proof of what you observed.

3. Kaleidoscopes!
   a. Set up two mirrors perpendicular to each other on a piece of paper. Put a small object or draw an asymmetrical image on the paper.
   b. How many different images do you see when looking in either of the mirrors?
   c. Reduce the angle between the mirrors, keeping the object between them. What happens to the images???
   d. Use a protractor to check the angle between the mirrors. How does the number of images change with the angle between the mirrors? Write an equation for this function.
   e. Sketch (from an above view) what the images look like for the angles, 120, 90 and 60 degrees. Be sure to note how the asymmetrical object is oriented in each reflection.
   f. Create a ray diagram that predicts the images for 120 degrees. Create a ray diagram that predicts the images for 90 degrees.

4. Laser shooting!
   a. With a partner stand in front of a mirror such that you can both see each other. Take a laser and have one person aim it at the other person's image in the mirror.
   b. Describe in detail what you both see? Draw an overhead view of the path of the light and what the image of the light looks like in the mirror.
   c. What does this experiment tell you about the behavior of light when it strikes a mirror?

5. Summary
   What are the requirements for you to be able to see an object's image in a plane mirror? Come up with your own rule in which you will always be able to predict where you have to

be to see an object's image in a mirror. Show an example of your rule using ray diagrams. Angle of incidence = angle of reflection is not a sufficient response to this summary.