Squared

Introduction

Light has many interesting aspects. An example is **reflection**. Reflection occurs when light bounces off a surface. Think about what happens when you look in a mirror. Whether you realize it or not, you are reflecting light. This light travels to the mirror, then bounces back to your eyes. This is how you see your reflection.

A guideline to working with mirrors is the **Law of Reflection:** The angle light hits a mirror will be the same angle light leaves the mirror.

You can use this principle to make a square. In this experiment you are going to use a laser and several mirrors to bounce the light around until it forms a square.

Materials

laser pointer
binder clip
white paper with a square drawn on it
protractor
ruler (one foot)
4 front-silvered mirrors

Procedure

1 Draw a laser-shaped space along one of the sides of the square. It should point to one of the corners.

2. Ask your teacher how to correctly position the mirror vertically. Front-silvered mirrors are easily damaged. **Do not touch the front of the mirror**.

3. At each corner of the square, set up a mirror facing inward. Number them 1-4 with the first one facing the laser beam.

4. Turn the laser on. **Never look directly at the laser beam or allow it to shine in someone's eyes.** Use the binder clip to maintain the laser pointer in the ON position.

5. Place the laser and binder clip in the middle of its space pointing towards a mirror.

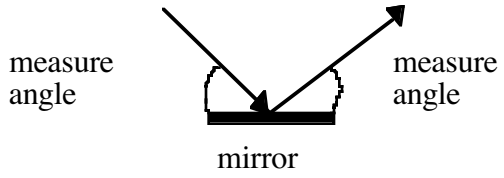
6. If you need help seeing the laser beam, ask your teacher for assistance.

7. Start adjusting the mirrors to reflect the laser light from one mirror to the next.

8. When all the mirrors are in place, draw a line showing where each mirror was. Be sure you draw the line accurately.

9. Remove the mirrors and the laser. Turn the laser off.

10. Using your protractor, measure the angle between your first mirror and the incoming laser light. Do the same for the outgoing laser light.



11. Using your protractor, measure the angle between each of the other mirrors and the incoming laser light. Do the same for the outgoing laser light. See previous picture.

Questions

1. What were the measurements of the angles for your first mirror?
2. What were the measurements of the angles for your second mirror?
3. What were the measurements of the angles for your third mirror?
4. What were the measurements of the angles for your fourth mirror?
5. What pattern did you notice about all of the angles you measured?

Conclusion

Does the incoming angle equal the outgoing angle? Use evidence from your lab to backup your claim.