Full Of Hot Air?

Introduction

Light has many interesting aspects. **Refraction** is the way that light bends as it travels through different mediums. The **medium** is the substance that light is traveling through. If you are looking at the Moon while standing by a pool, the medium is air. If you are looking at the Moon from under water after you jump into the pool, the mediums are both air and water. The Moon would appear different from underwater because the light is refracted.

In this experiment you are going to decide if warm air and cool air are considered to be different mediums, or if they are the same medium.

Materials

Clay
Candle (any size)
Laser pointer
Binder clip
White paper (8.5 x 11")
Masking or transparent tape
Styrofoam cup
Meter stick

Procedure

I: Cool Air

1. Tape the white paper to a wall.

2. Measure a distance of 1.10 meter from the paper.

3. Place the cup at this mark.

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 pointer on top of the cup.

6. Observe the point of light that is formed on the white paper. Record your observations in a data table. Turn off the laser.

II: Hot Air

1. Tape the white paper to a wall.

2. Measure a distance of 1 meter from the paper.

3. Imbed the candle into the clay.

4. Set the candle in clay at the 1-meter mark.

5. Measure a distance of 10 cm from the candle in clay.

6. Place the cup at this mark.

7. Light the candle.

8. Allow the candle to burn for 2 minutes. **Be careful with the fire!**

9. Place the laser pointer on top of the cup in the ON position.

10. After 2 minutes, observe the point of light that is on the white paper. Record your observations in a data table.

12. Blow out the candle. Observe the effects of the smoke on the laser. Record your observations in a data table. Turn off the laser.

Questions

1. What did the point of light look like when it went through cool air?
2. What did the point of light look like when it went through hot air?
3. Can you relate this to stars in the night sky and our atmosphere?
4. Describe what happened after you blew out the candle. Why did this happen?

Conclusion

Are warm air and cool air considered to be different mediums, or are they the same medium? Use evidence from your lab to backup your claim.