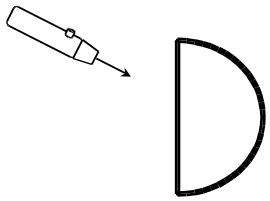
TASK CARD FOR INQUIRY STARTER

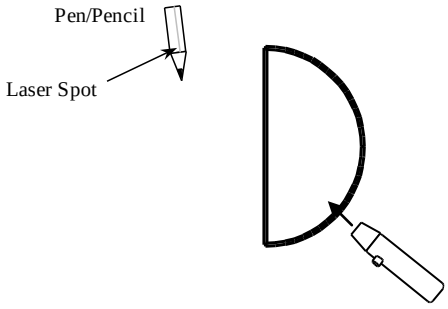
Note: It may be necessary to darken the room slightly in order to see the laser beam more easily.
Safety Note: Always use caution when using lasers. They should not be pointed directly at anyone and you should never directly shine the beam into your eyes or those of anyone else. This can result in damage and/or possible loss of eyesight.

Part I

1. Fill a refraction cup about ½ to ¾ full of water,
2. Shine the laser beam at an angle to the cup. If you cannot see the beam through the water, add a pinch of coffee creamer, and stir so the mixture is homogeneous.
3. Use a straw (or other straight edge) to help you sight a straight line. Does the laser beam always maintain a straight-line path once it enters the water? Would there be conditions where your answer to the previous question would change?
4. Record your observations. Change the angle of the laser beam. Sketch the path of the light for each trial.



5. Now shine the laser light from the other side of the cup so that the light travels through the cup as shown below. Use a pencil or index card to help mark the light path after it leaves the cup. Change the angle of the laser beam. Sketch the light path from the laser through the cup and out the flat side.



Focused Investigation (Introduction)

Introduce additional materials

We are going to take time to look at the questions that have been identified to see what you would like to investigate. Before you select that question you will need to know what materials are available for your investigation. The materials available include: red lasers, refraction tank, food coloring, gelatin that you can cut into assorted shaped, assorted transparent liquids such as Karo® syrup, baby oil, vegetable oil, vinegar, Acrylic, water, and shampoo.

Once you have identified your question, find someone with a similar interest in your question. If there are over four people interested in your question, please form two groups. Meet with your group to refine your question. Record the following on your template: your question, the materials, your hypothesis, and the first three steps of your procedure. When completed, bring the template to the instructor for approval.

Planning and conducting your investigation

After you have received approval from your instructor, proceed with planning and conducting your investigation. Be sure to follow all safety procedures. Create appropriate data tables, graphs and recording sheets.

Conduct your investigation in the time allocated by your instructor.

When you have completed your investigation, clean up and properly dispose of all materials you will not be using in your share out.

Concluding

Prepare a two-minute presentation highlighting what question you investigated, the procedure you followed, data collected, and what you learned from your investigation.

Synthesis

It is important to synthesize the information you have learned in a way that highlights the main findings and scientific truths. This often leads to a deeper understanding of the content and may reveal scientific misconceptions that could be addressed during further investigations. Talk about main ideas associated with the investigation.

TEMPLATE FOR INVESTIGATION

Question:

Materials:

Hypothesis:

Procedure:

1.

2.

3.