Pre-lab for Optical Bench - Refraction, Critical Angle

1. True or False: The speed of light is constant and is $3 \times 10^8$ m/s. _______

2. From the laboratory procedure or from your textbook find the definition of the index of refraction. Define it below:

Refraction is the bending of a beam of light, and as you know, also has to do with the speed of light. As light travels from one medium, such as air, to a denser medium, such as water, the light ray bends. The velocity of the light wave also changes.

3. In going from air to water, a ray of light will (circle one):

   Speed Up  Slow Down

4. You will observe two phenomena that occur when light hits a surface between two mediums (such as air-water or air-plastic); one is refraction, name the other:

   Refraction and reflection occur at most boundaries between materials (there are exceptions for special cases). Some of the light is refracted and some is reflected, so both of these rays of light will be dimmer than the original, incident, beam. You will observe this throughout the lab.

5. Below write the definition of Total Internal Reflection:
Total Internal Reflection occurs at “the critical angle”. You will determine the critical angle during the lab. You will notice that the reflected beam of light, as the incident beam of light reaches the critical angle, suddenly gets a lot brighter. This is because all of the previously refracted light is now being reflected, so the reflected beam is as intense as the incident beam at angles over the critical angle. You will observe this shortly.

6. Below write the formula, from the lab or your textbook, for critical angle. Also, draw a diagram to show the variables in the equation.

7. Define Chromatic Aberration:

8. The phenomenon underlying Chromatic Aberration is (circle one):
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<thead>
<tr>
<th>Refraction</th>
<th>Reflection</th>
<th>Dispersion</th>
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