

Name: _____

Refraction of Light: Inquiry Questions

- Do the following questions on lined paper.
 - Use complete sentences to fully explain your answer and your reasoning.
 - Include properly labeled diagrams where appropriate.
1. If a light ray does not undergo refraction at the boundary between two transparent media, what is its angle of incidence?
 2. How does the angle of incidence compare with the angle of refraction when a light ray passes from air into glass at an angle? Draw a fully labeled diagram to represent this occurrence.
 3. How does the angle of incidence compare with the angle of refraction when a light ray leaves glass and enters air? Draw a fully labeled diagram to represent this occurrence.
 4. Explain the relationship between optical density and the index of refraction.
 5. The index of refraction for blue light in glass is slightly higher than that for red light in glass. What does this indicate about
 - a) the relative speeds of red light and blue light in glass, and
 - b) the angles of refraction for each color, for the same angle of incidence?
 6. Light travels from medium A to medium B. The angle of refraction is greater than the angle of incidence.
 - a) Which medium has the higher index of refraction?
 - b) In which medium does the light travel at a lower speed?
 7. To successfully spear a fish, you must aim below the apparent position of the fish. Use a labeled diagram to help explain this.
 8. In which medium does light travel faster - one with a critical angle of 27° or one with a critical angle of 32° ? Explain. For both cases, air is the second medium.
 9. Is the critical angle for glass with an index of refraction of 1.53 greater or less than for glass with an index of refraction of 1.60?
 10. Would your answer for 9. have been different if the second medium were water instead of air? Explain.