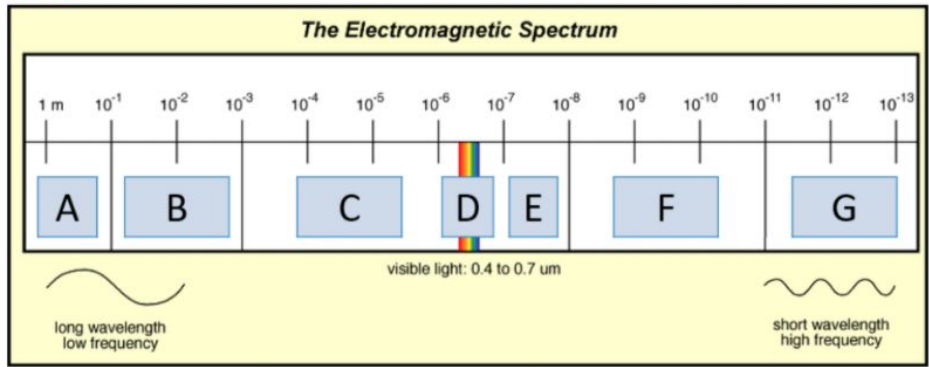


Direct:

1. Be sure to watch EdPuzzle video of Chris Doner's introduction to Snell's Law.
2. Next look at your data booklet, and find the equation there.
3. The Electromagnetic Spectrum is a specific kind of energy, grouped by wavelength or frequency. Fill in the names of the waves in the table next to the letters bel

Electromagnetic Spectrum

A	
B	
C	
D	
E	
F	
G	



4. Write the speed of light in a vacuum in the table below and then calculate the index of refraction for each material listed.

Index of Refraction

Medium	Wave Speed (v)	Index of Refraction (n)
Vacuum		
Air	$2.999 \times 10^8 \text{ m s}^{-1}$	
Water	$2.256 \times 10^8 \text{ m s}^{-1}$	
Glass	$1.974 \times 10^8 \text{ m s}^{-1}$	

$$\frac{n_1}{n_2} = \frac{v_2}{v_1}$$

5. Draw in the REFRACTED ray for each of the conditions below:

Refraction

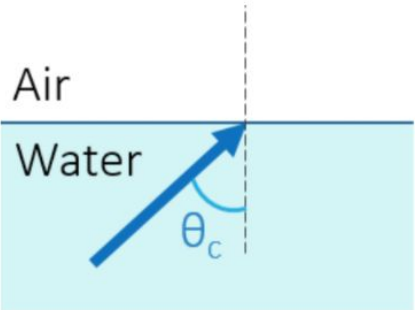
$$\frac{n_1}{n_2} = \frac{\sin\theta_2}{\sin\theta_1}$$

<p>Air (n = 1) Water (n = 1.33)</p>	<p>Water (n = 1.33) Air (n = 1)</p>
<p>Air (n = 1) Glass (n = 1.52)</p>	<p>Glass (n = 1.52) Air (n = 1)</p>

6. The critical angle formula is a specialized version of Snell's law. Can you derive it in the space below?

7. Fill in the missing information below.

Critical Angle

When $\theta_1 = \theta_c$ $\theta_2 =$	$\theta_c =$	 <p>The diagram shows a horizontal interface between Air (top) and Water (bottom). A blue arrow representing a light ray originates from a point in the water and points towards the interface. A vertical dashed line is drawn perpendicular to the interface at the point where the ray meets it. The angle between the ray and this dashed line is labeled θ_c.</p>
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Here are some practice Snell's Law Problems for you.

Common Indices:

8. A ray of light traveling from air into crown glass strikes the surface at an angle of 30° . What will the angle of refraction be?

Air or vacuum: 1.00;
Water: 1.33;
CR39: 1.498;
Crown Glass: 1.523;
Barium glass: 1.60;
Flint glass: 1.70;
Polycarbonate: 1.586;
Diamond: 2.45

9. Light traveling through air encounters a second medium which slows the light to 1.88×10^8 m/s. What is the index of the second medium?

10. What is the index of refraction of a refractive medium if the angle of incidence in air is 40° and the angle of refraction is 29° ?

11. If the angle of incidence of light traveling through air, striking water, is 30° , what is the angle of refraction?

12. What is the velocity of light (m/s) in a material with an index of 2.0?

13. What is the angle of incidence of light traveling from water into flint glass, if the angle of refraction is 30° ?

14. Light travels at 1.76×10^8 m/s through an optical medium. What is the medium?