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**كلية العلوم**

**قسم الفيزياء الطبية**

MEDICAL PHSICS **المرحلة : الثانية**

**المادة : البصريات**

**اسم التجربة: " Law s' Snell** **"**

**رقم التجربة : 1**

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**:The purpose of the experiment**

**- Study the refraction of light as it travels between two different media.**

**Verify Snell's law (law of refraction)** **-**

**Introduction :-**

**: Theory (Detailed Explanation)**

**: Refraction Phenomenon**

**When light travels from one transparent medium to another (e.g., air to glass), its**

**speed changes due to the difference in optical density, causing the light to bend at**

**the interface between the two media. This bending of light is called refraction.**

**: Snell's Law**

**Snell's Law mathematically describes the relationship between the angles of**

**: incidence and refraction and the refractive indices of the two media**

**n1 sin(θ1) = n2 sin(θ2)**

**:Where**

**- n1: Refractive index of the first medium (air, typically n1 = 1).**

**- n2: Refractive index of the second medium (glass).**

**- θ1: Angle of incidence, measured between the incident ray and the normal to the**

**surface.**

**- θ2: Angle of refraction, measured between the refracted ray and the normal.**

**:Tools used**

**1. Light source (laser)**

**2. Transparent or rectangular semicircle made of glass or plastic.**

**3. Protractor (for measuring angles).**

**4. Graph paper.**

**5. Pencil and ruler.**

**:Refractive Index**

**:The refractive index n is defined as the ratio of the speed of light in a vacuum (c) to**

**its speed in a given medium (v)**

**n = c/v**

**The greater the refractive index, the slower the light travels in the medium and the**

**greater the bending of light at the interface.**

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**Practical Application:**

**By measuring the angles of incidence (θ1) and refraction (θ2) for light passing**

**through the glass, the refractive index of the glass can be calculated using:**

**n2 = sin(θ1) / sin(θ2)**

**Factors Affecting Refraction:**

**1. Wavelength of Light: Red light bends less than blue light due to its longer**

**wavelength.**

**2. Temperature: Changes in temperature can alter the density of glass and its**

**refractive index.**

**3. Material Purity: Impurities or irregularities in the glass can slightly affect its**

**refractive index.**

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**Procedure:**

**1. Setup: - Place the glass piece on a sheet of white paper on a flat surface. - Stabilize the light source to produce a precise beam.**

**2. Measure the Angle of Incidence: - Direct the light beam onto the glass surface at a specific angle (θ1) measured using the protractor.**

**. - Mark the point of incidence and draw the incident ray’s path on the paper.**

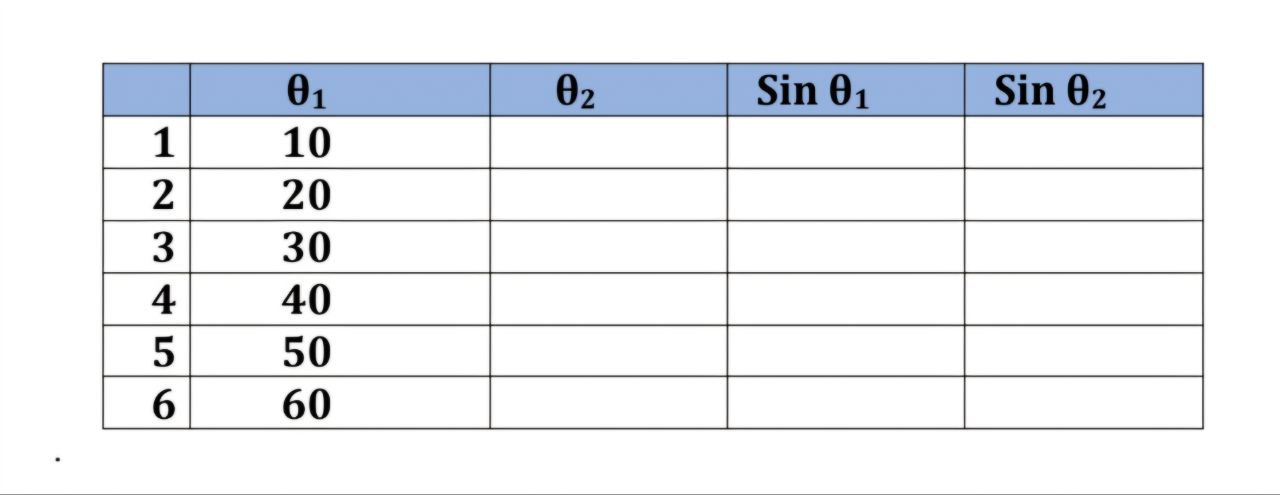
**3. Measure the Angle of Refraction: - Observe the refracted beam inside the glass and mark its exit point.**

**- Draw the refracted ray’s path and measure the angle of refraction (θ2) using the** **protractor.**

**4. Record the results in the table as show below**

**5.Calculate the Refractive Index:**

**- Repeat the experiment for different angles of incidence**

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