

Lesson Plan: The Human Eye and the Colourful World (CBSE Class X 2026-27)

Teacher:

Class: X

Subject: Science (Subject Code - 086)

Unit III: Natural Phenomena (Unit Weightage: 12 Marks)

Chapter: 10 – The Human Eye and the Colourful World

Estimated Number of Periods: 10

1. Gist of the Lesson & Curricular Goals

- **Core Syllabus:** Functioning of a lens in the human eye, defects of vision and their corrections. Refraction of light through a prism, dispersion of light, scattering of light, and applications in daily life (excluding the colour of the sun at sunrise and sunset).
- **Educational Aim:** To connect abstract physical principles of light to human biology (vision) and majestic natural phenomena (rainbows, blue sky), fostering a sense of curiosity and real-world scientific observation.

2. Teaching-Learning Plan & Pedagogy

Key Concepts	Competencies (C) & Learning Outcomes	Teaching-Learning Activities (Pedagogy)	Assessment Strategies
The Human Eye & Power of Accommodation	<p>C-2.3: Manipulates properties of lenses to observe image characteristics.</p> <p>• <i>Outcome:</i> Students will identify the parts of the human eye and explain how the ciliary muscles adjust</p>	<p>• Visual Mapping: Draw a cross-section of the human eye on the board, tracing the path of light to the retina.</p> <p>• Discussion: Connect the biological function of</p>	<p>• [Demonstrate Knowledge - VSA]: <i>Name</i> the part of the eye that controls the amount of light entering it.</p> <p>• [Application - SA]: <i>Explain</i> the concept of the power of</p>

	the focal length.	the iris/pupil to a camera's aperture.	accommodation.
Defects of Vision & Corrections	<p>C-2.3: Extends understanding to a combination of lenses.</p> <ul style="list-style-type: none"> • <i>Outcome:</i> Students will diagrammatically represent Myopia, Hypermetropia, and Presbyopia, and determine the corrective lenses required. 	<ul style="list-style-type: none"> • Ray Diagrams: Draw parallel and diverging rays entering defective eyes, and show how concave/convex lenses correct the focal point to rest exactly on the retina. • Real-World Connection: Ask students with glasses to share their prescriptions (plus or minus power) to identify their defect. 	<ul style="list-style-type: none"> • [Application - LA]: <i>Illustrate</i> the correction of Myopia using a ray diagram. • [Formulate & Analyze - Case-Based]: <i>Analyze</i> a prescription of -2.5 D to deduce the defect of vision and the focal length of the corrective lens.
Refraction through a Glass Prism	<p>C-8.2: Accurately uses scientific instruments and draws inferences based on data.</p> <ul style="list-style-type: none"> • <i>Outcome:</i> Students will trace the path of light through a prism and define the angle of deviation. 	<ul style="list-style-type: none"> • Mandatory Practical (Exp 13): Tracing the path of the rays of light through a glass prism. Students will use drawing boards and pins to measure the angle of incidence, emergence, and deviation. • Data Mapping: Draw the geometrical outline of the prism and the bending of the ray. 	<ul style="list-style-type: none"> • [Demonstrate Knowledge - Objective]: <i>Identify</i> the angle of deviation in a given prism ray diagram. • [Formulate & Analyze - SA]: <i>Interpret</i> how the angle of deviation changes with the angle of incidence based on practical data.

<p>Dispersion & Atmospheric Refraction</p>	<p>C-8.1: Develops accurate models to represent real-life events and phenomena using scientific principles.</p> <ul style="list-style-type: none"> • <i>Outcome:</i> Students will explain the formation of a spectrum, rainbows, and the twinkling of stars. 	<ul style="list-style-type: none"> • Demonstration: Pass a beam of white light through a prism in a darkened room to display the visible spectrum (VIBGYOR). • Concept Mapping: Step-by-step explanation of a rainbow (refraction → dispersion → total internal reflection → refraction). 	<ul style="list-style-type: none"> • [Demonstrate Knowledge - VSA]: <i>Define</i> dispersion of light. • [Application - SA]: <i>Explain</i> the phenomenon of atmospheric refraction and how it causes stars to twinkle.
<p>Scattering of Light</p>	<p>C-8.1: Represents real-life events using scientific principles.</p> <ul style="list-style-type: none"> • <i>Outcome:</i> Students will apply the Tyndall effect to explain the blue colour of the sky. 	<ul style="list-style-type: none"> • Demonstration: Shine a flashlight through a colloidal solution (water with a few drops of milk) to simulate the Tyndall effect and the scattering of shorter wavelengths. • <i>Note:</i> Explicitly exclude the topic of the sun's colour at sunrise/sunset as per syllabus constraints. 	<ul style="list-style-type: none"> • [Application - SA]: <i>Illustrate</i> why the sky appears blue on a clear day. • [Analyze & Evaluate - Assertion-Reasoning]: <i>Evaluate</i> why the sky appears dark instead of blue to an astronaut in space.

3. Assessment Structure & Weightage

Assessments are strictly modeled on the CBSE 2026-27 Theory Question Paper Design (80 marks) :

- **Demonstrate Knowledge and Understanding (50%):** Assessed via questions asking students to *state, name, list, identify, define, suggest, describe, outline, and summarize*

(e.g., naming eye parts, defining the Tyndall effect).

- **Application of Knowledge/Concepts (30%):** Assessed via questions asking students to *calculate, illustrate, show, adapt, explain, and distinguish* (e.g., illustrating corrective lenses, explaining atmospheric refraction).
- **Formulate, Analyze, Evaluate and Create (20%):** Assessed via questions asking students to *interpret, analyze, compare, contrast, examine, evaluate, discuss, and construct* (e.g., analyzing lens prescriptions, examining prism deviation angles).

4. Digital Integration & Portfolio Enrichment (Internal Assessment - 20 Marks)

- **Subject Enrichment (Practical Work - 5 Marks):** Evaluated strictly on the execution of Experiment 13 (Tracing light through a glass prism). Students will be assessed on their precise pin placement, accurate use of a protractor for measuring angles, and the neatness of their ray tracings in the lab record.
- **Digital Integration Strategy:** To reinforce abstract optical concepts ahead of Periodic Assessments (5+5 Marks), utilize interactive digital modules (such as PhET simulations via the DIKSHA portal) to allow students to digitally bend light through various virtual prisms and experiment with color mixing and dispersion.
- **Portfolio Task (5 Marks):** Students will conduct a "Vision Health Survey" within their family or neighborhood. They will *examine* the optical prescriptions of three individuals wearing spectacles, noting the power of the lenses. Based on the positive or negative signs, they will prepare a brief write-up *identifying* the specific vision defect (Myopia/Hypermetropia) and *constructing* a simple ray diagram showing how that specific lens corrects their family member's vision. This will be securely added to their academic portfolio.