

CLASS 12 PHYSICS: SECTION 8.4.5



The Powerful Rays Just Beyond Violet

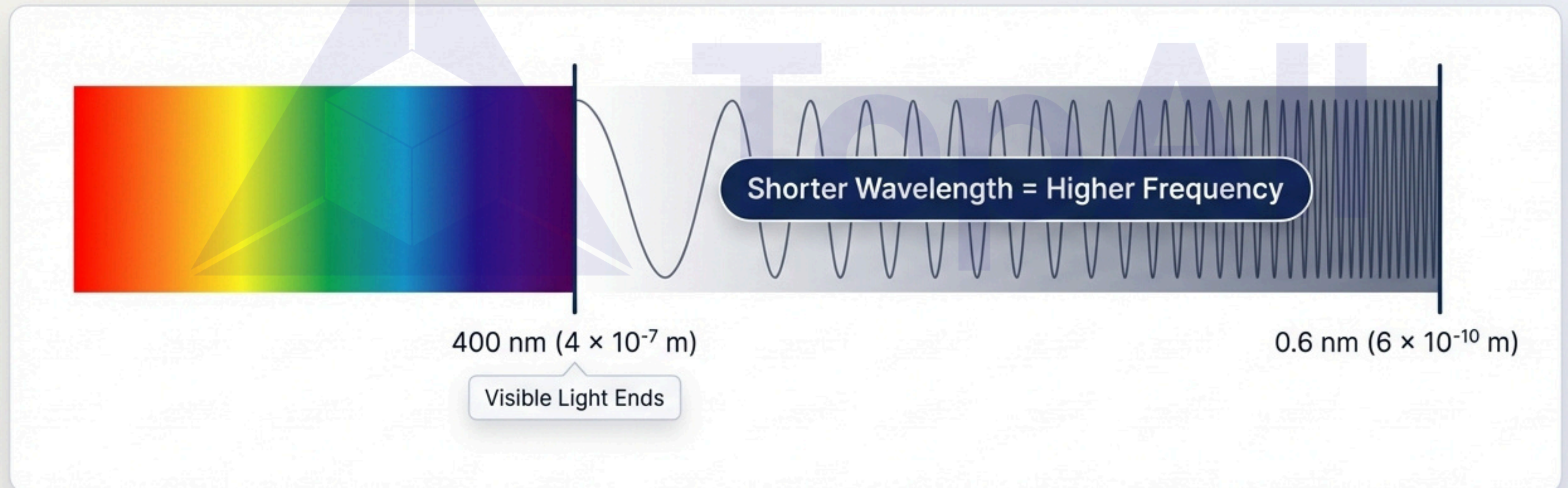
Understanding the Properties, Risks, and Applications of Ultraviolet (UV) Radiation



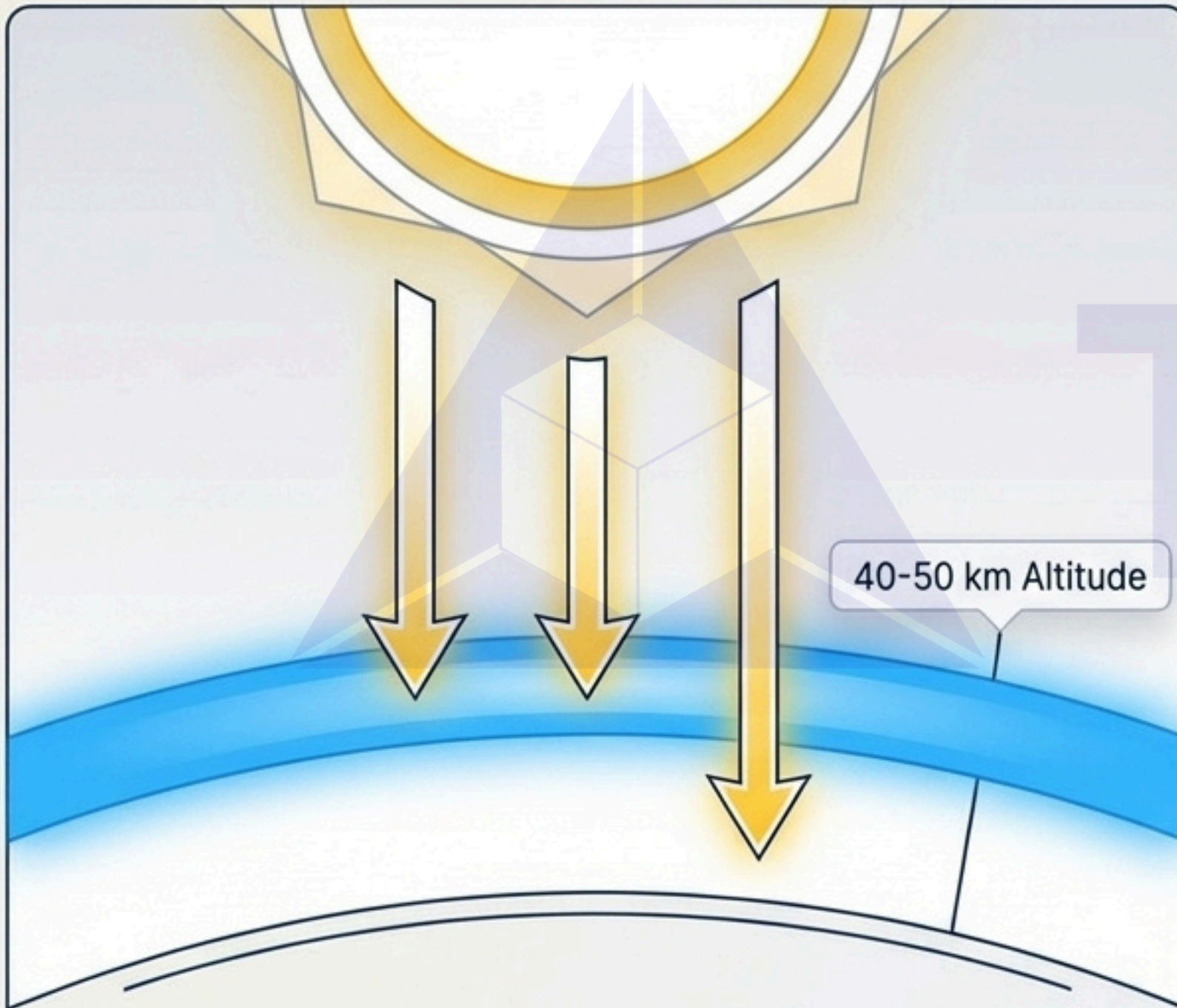
An exploration of Section 8.4.5: Discovering how the invisible waves that challenge our atmosphere are harnessed for human health and technology.

Beyond the Visible Range

Ultraviolet (UV) radiation occupies the space immediately after the visible spectrum. As the name suggests, it lies strictly beyond visible violet light.



The Sun and the Stratosphere



The Source

The Sun is the primary natural source of UV light (alongside special lamps and very hot bodies).

The Shield

Fortunately, a clean atmospheric shield—the ozone layer—absorbs much of the Sun's incoming UV radiation.

The Altitude

This crucial absorption occurs high in the atmosphere at an altitude of about 40 to 50 km.

Global Concern: The protective ozone layer is vulnerable to depletion by chlorofluorocarbons (CFCs), such as freon gas.



**You've Learned the Theory.
Let's Test Them Now.**

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

Practice Now



At prep.topall.app

Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



How UV Affects Human Skin



Melanin Production

Exposure to UV radiation induces the body to produce more melanin. This biological defense mechanism is the direct cause of skin tanning.



Natural Absorption

Ordinary glass completely absorbs UV radiation. Because of this property, it is impossible to get a sunburn or a tan through a closed glass window.

Guarding the Eyes from UV Intensity

Dangerous Quantities

Large quantities of UV light are inherently harmful to human eyes. For example, industrial welding arcs produce massive amounts of intense, localized UV radiation.



Protective Engineering

Welders utilize a specialized protection to work safely. They wear special glass goggles or face masks equipped with glass windows, leveraging glass's natural UV-absorbing properties to shield their eyes.

Harnessing the Power of UV

LASIK Eye Surgery



Because of its incredibly short wavelengths, UV radiation can be focused into extremely narrow, highly precise beams. This makes it ideal for delicate procedures like Laser-assisted in situ keratomileusis (LASIK).

Water Purification



The biologically disruptive nature of UV light is redirected to ensure public safety. Special UV lamps are actively used in water purifiers to efficiently kill germs and secure clean drinking water.

Key Takeaways: Ultraviolet Rays



Position & Scale: UV lies strictly beyond visible violet, with short wavelengths spanning down from 400 nm to 0.6 nm.



Natural Shielding: The Sun is our primary source, but the Earth is largely protected by the ozone layer at a high altitude of 40–50 km.



Dual Nature: While large quantities harm our eyes and skin, its focused power is highly useful. We use glass to protect welders' eyes, while harnessing UV for precision LASIK surgery and safe water purification.

Mastery achieved. You now understand the physics and applications of Section 8.4.5.



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

That's exactly what TopAll Pro is built for.

Try TopAll Pro Now

What TopAll Pro Does Differently

-  **Stuck? Snap it. Solve it. — Doubts AI**
Photo → step-by-step solution in seconds, 24/7
-  **Your AI Coach finds your blind spots**
Concept-level weakness detection — not just chapter-level
-  **4.5 Lakh+ questions. Never run out.**
13× more content than any other prep app in India
-  **Build your own test in 60 seconds**
Pick a chapter, set difficulty — AI does the rest instantly.
-  **AI Recommendation that helps you improve**
AI Recommendation Analysis your Tests and tell you where you need to improve.



Practice the moment you finish studying
Jump in while the concept is still fresh in your head

4.5L+
MCQs

1.5L+
Students

AI Powered
In-Depth Analysis