



CLASS 12 PHYSICS • SECTION 8.4.3

The Invisible Heat Waves Around You

Exploring the physics and applications of infrared radiation.

TopAll

Beyond the Visible Spectrum

Infrared waves occupy the band immediately adjacent to the low-frequency, long-wavelength end of the visible light spectrum.

Radio

Microwaves

Infrared

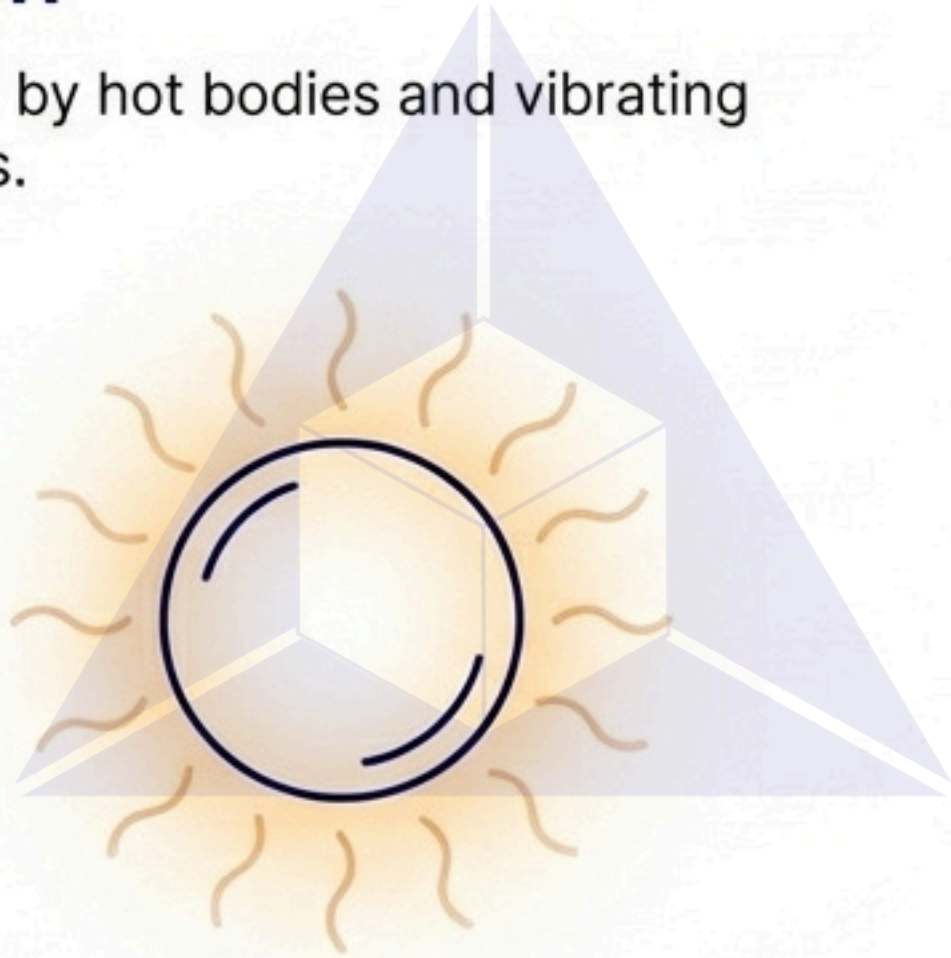
Visible Light

Lower frequency / Longer
wavelength than visible red.

The Physics of Heat Waves

Emission

- Produced by hot bodies and vibrating molecules.



Absorption

- Molecules absorb the waves, increasing their thermal motion and heating their surroundings.



Often called "Heat Waves"



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

$$E=mc^2$$



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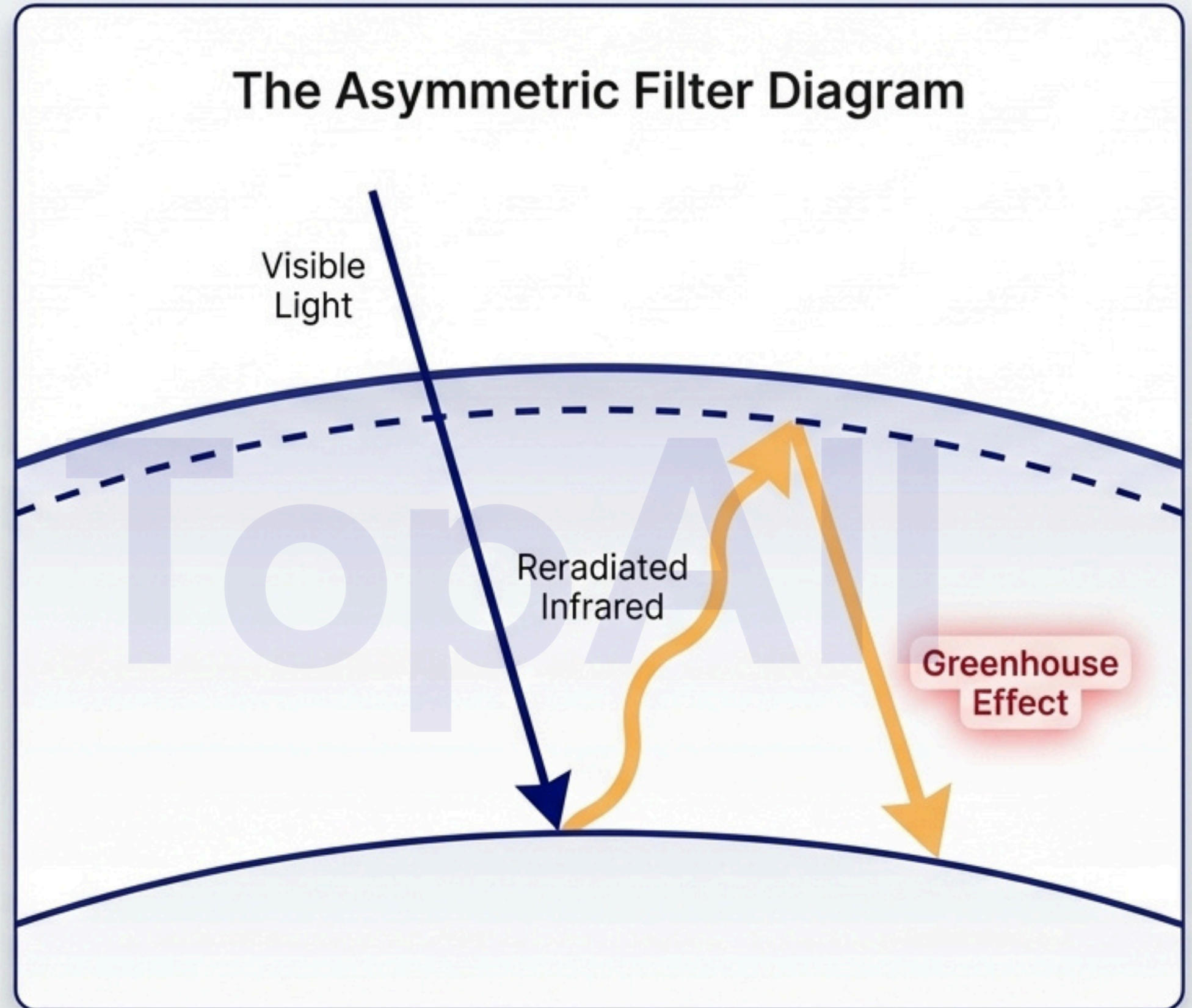
Key Highlights

- » 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



The Planetary Thermostat

1. **Incoming:** Visible light passes easily through the atmosphere to the surface.
2. **Reradiation:** Earth absorbs visible light and reradiates it as longer-wavelength infrared.
3. **Trapping:** Greenhouse gases (CO_2 , water vapour) trap the infrared radiation, maintaining Earth's warmth.



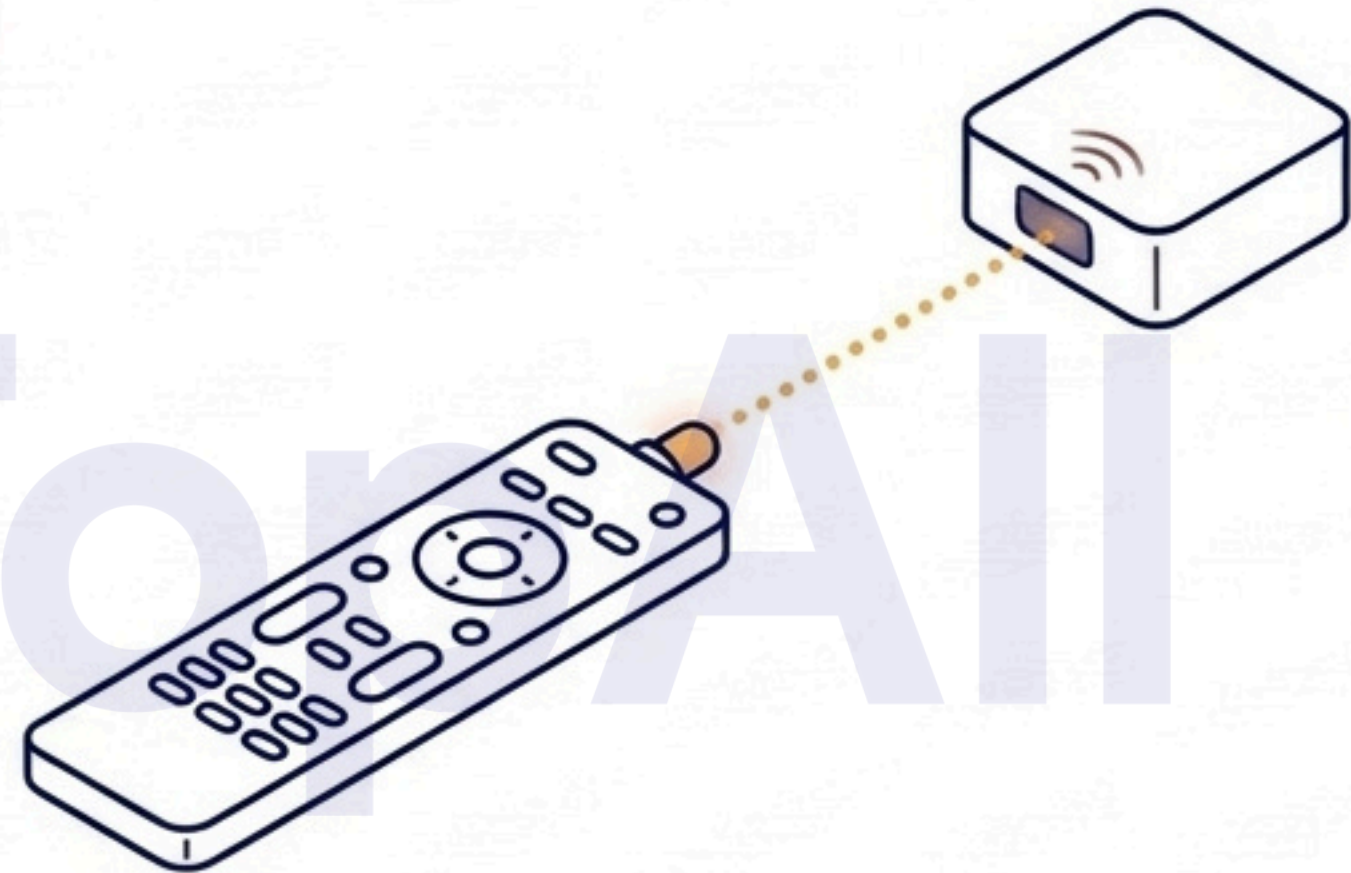
Everyday Tech: [Consumer Electronics] The Remote Control

Electronic devices utilize semiconductor light-emitting diodes (LEDs) to emit specific infrared frequencies.

TV Sets

Video Recorders

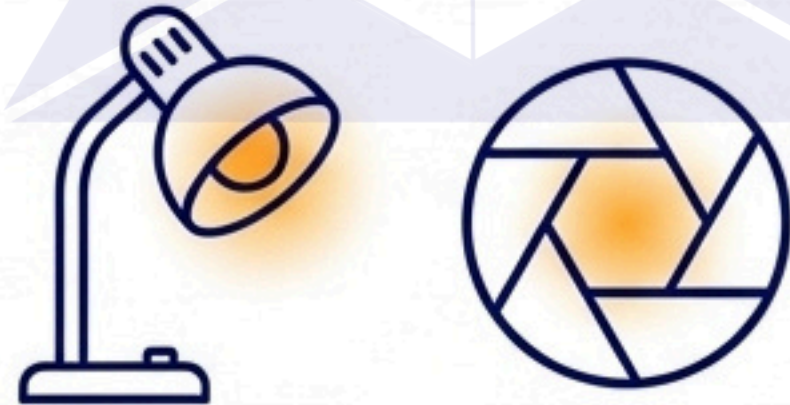
Hi-Fi Systems



From Medical Clinics to Orbit

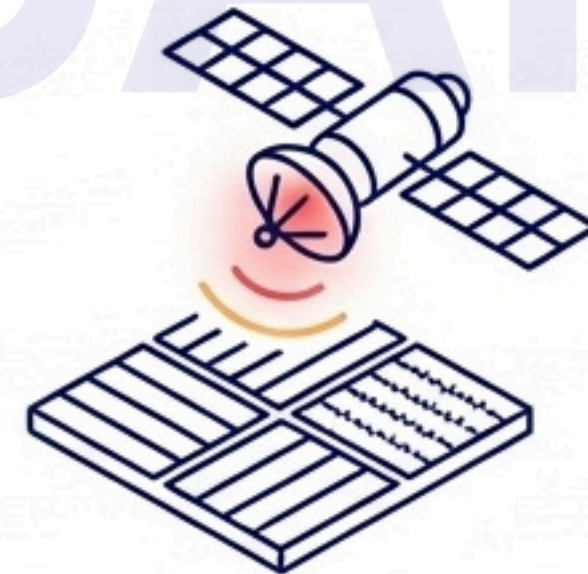
[Medical & Imaging]

Infrared lamps use the heating effect of the waves for physical therapy. Infrared photographic film captures thermal data invisible to the eye.



[Space & Military]

Satellites equipped with infrared detectors monitor the Earth from orbit, observing the growth of crops and serving military detection purposes.



Key Takeaways

Nature: Lies below visible red; often called 'heat waves'.

Mechanism: Produced by hot bodies; absorbed by molecules (H_2O , CO_2) to increase thermal motion.

Planetary: Earth reradiates IR; trapping of IR drives the greenhouse effect.

Applications: Used in physical therapy, remote controls, photography, and satellite detection.

✓ Ready for the exam!



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

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

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MCQs

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AI Powered
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