

Electromagnetic Radiation Analysis

<https://gemini.google.com/app/7cc3de6956955758>

Response: Statements **(a)** and **(b)** are **true**.

Analysis of Each Statement

- **(a) True:** Frequency (ν) and wavelength (λ) are inversely proportional ($\nu = \frac{c}{\lambda}$). Since $200 \text{ nm} < 250 \text{ nm}$, the 200 nm radiation has a **higher frequency**.
 - **(b) True:** The visible light spectrum spans roughly 400 nm to 700 nm. Radiation at 200 nm falls in the ultraviolet (UV) region, so it is **not in the visible region**.
 - **(c) False:** All electromagnetic radiation travels at the same constant speed of light ($c \approx 3.00 \times 10^8 \text{ m/s}$) in a vacuum, regardless of wavelength.
 - **(d) False:** Photon energy is directly proportional to frequency ($E = h\nu = \frac{hc}{\lambda}$). A shorter wavelength (200 nm) corresponds to **higher photon energy**, not lower.
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