

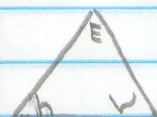
Energy of EM Waves

↳ EM waves are sent out in photons

↳ each photon has some energy

Max Planck (German)

$$\text{Energy of photon} = \text{Frequency of Photon} \times \text{Planck's constant}$$



$$\text{Abb: } E = h \times \nu \leftarrow \text{Greek letter "nu"}$$

$$\text{SI Units: } J = \text{Hz} \times 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$$

Practice Problems

Frequency

1) $6.53 \times 10^{14} \text{ Hz}$

Energy of Photon
 $4.33 \times 10^{-19} \text{ J}$

2) $4.96 \times 10^{17} \text{ Hz}$

$3.29 \times 10^{-16} \text{ J}$

3) $3.65 \times 10^{19} \text{ Hz}$

$2.42 \times 10^{-14} \text{ J}$

4) $6.49 \times 10^{14} \text{ Hz}$

$4.3 \times 10^{-19} \text{ J}$

5) Wavelength = $6.8 \times 10^{-7} \text{ m}$

what is energy?

$$3.0 \times 10^8 \frac{\text{m}}{\text{s}} \div 6.8 \times 10^{-7} \text{ m} = 4.41 \times 10^{14} \text{ Hz}$$

$$4.41 \times 10^{14} \text{ Hz} \times 6.626 \times 10^{-34} \text{ J}\cdot\text{s} = 2.92 \times 10^{-19} \text{ J}$$