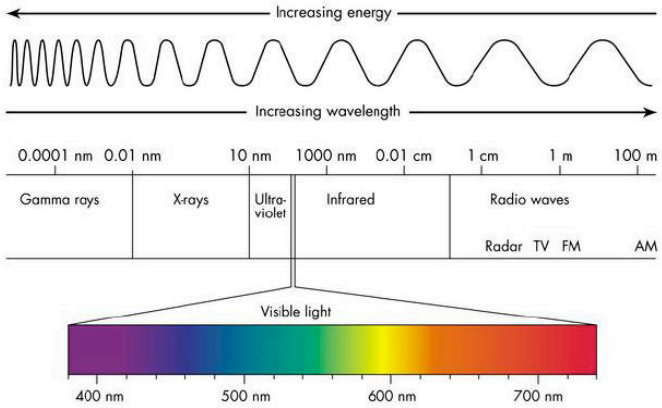
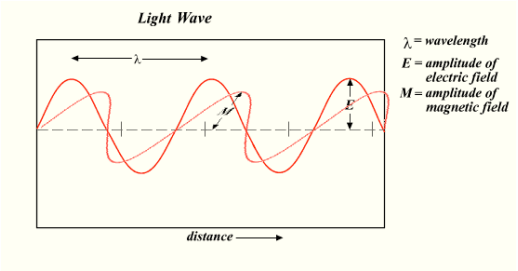
Electromagnetic Radiation





Quantity	Symbol	Unit	Value
Wavelength			
Frequency			
Speed of Light			
Planck's constant			
Photon Energy (Quantum)			

New unit: 1 Joule (J) = 1 kg·m^2/s^2 = 0.239 calories

How does the wavelength of the electromagnetic waves emitted by your kitchen microwave oven compare to the wavelength of those emitted by your cell phone?

Microwave (υ = _____ s^{-1})

Cell Phone (υ = _____ s^{-1})

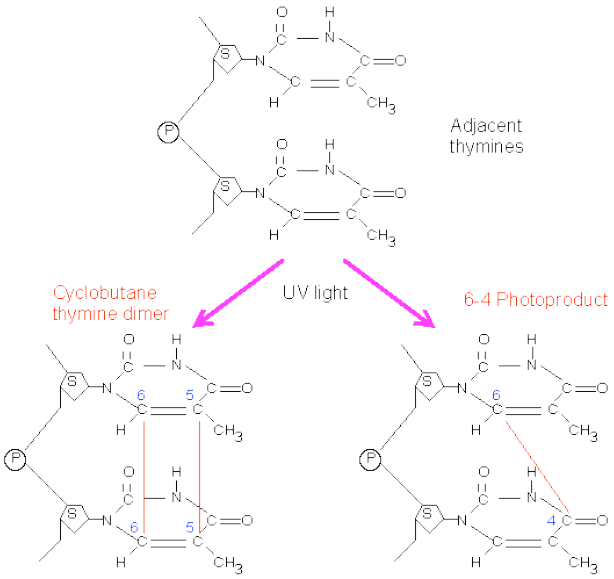
How does the energy of the waves emitted by your microwave compare to the energy of waves emitted by your cell phone?

Microwave

Cell Phone

DNA Damage and UV-B Radiation

Pyrimidine dimer formation:



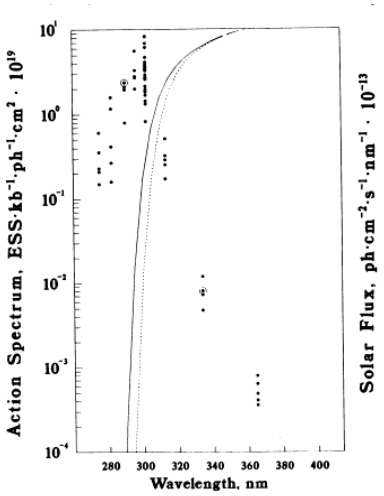


FIG. 1. Action spectrum for pyrimidine dimer formation in human skin (●) and solar spectra at the surface of the earth for stratospheric ozone levels of 0.32 cm (---) and 0.16 cm (—) (14). Each point in the action spectrum represents the slope of the dose–response line (dimer yields at three exposures) for one volunteer at one wavelength, obtained from triplicate independent determinations. A total of 30 points occurs at 302 nm, although some points overlie other values. There are five points at each other wavelength; points at 290 and 334 nm are circled to indicate that identical dimer yields were recorded for two volunteers. ph, Photon.

Type	Wavelength (λ)	Frequency (υ)	Energy per Photon
UV-A			
UV-B			
UV-C			

$$\lambda \cdot \upsilon = c \qquad E = h \cdot \nu \qquad h = 6.626\,x10^{-34}\,J \cdot s$$