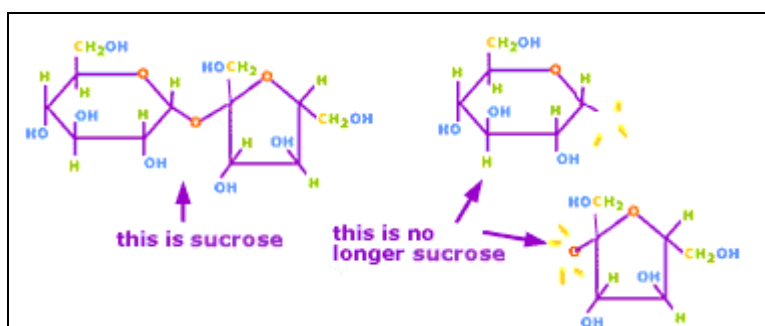


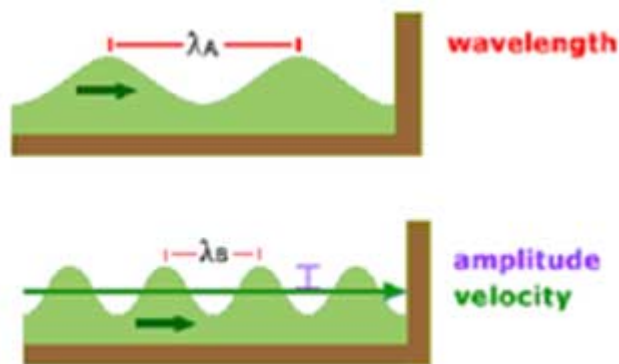
The Wave Nature of Light

key concepts:

- A **quantum** is an indivisible amount of something, such as **light**, **energy**, or **matter**.
- Light has **wave** properties, including **wavelength**, **amplitude**, **velocity**, **frequency**, and **period**.
- The electromagnetic **spectrum** is a continuum of wavelengths of **electromagnetic radiation**.



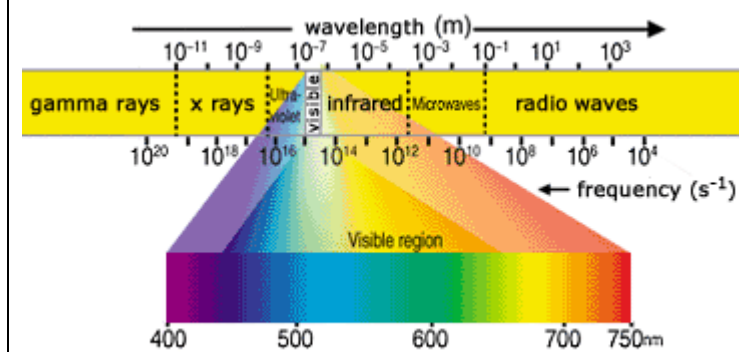
A quantum is an indivisible amount of something, such as light, energy, or matter. For example, the **mass** of sucrose is quantized. The smallest increment of mass that can be added or removed from a sample of sucrose is one **molecule**—anything less is no longer sucrose.



Light has wave properties, including wavelength, amplitude, velocity, frequency, and period.

The wavelength (λ) is the distance between one wave maximum and the next. The amplitude (A) is the height of the wave, and the velocity (v) is the rate at which a wave is propagating in a given direction. The frequency (ν) is the number of wave peaks that pass a point per unit time, and the period is the time interval between peaks of a wave.

Wavelength (λ), frequency (ν), and velocity (v) are related by the equation $v = \nu \cdot \lambda$. For light, the velocity is a constant, $c = 3.00 \times 10^8$ m/s.



The electromagnetic spectrum is a continuum of wavelengths of electromagnetic radiation. Visible light is a small subset of this spectrum, which also includes **gamma radiation**, **x rays**, **ultraviolet radiation**, **infrared radiation**, **microwaves**, and **radio waves**.