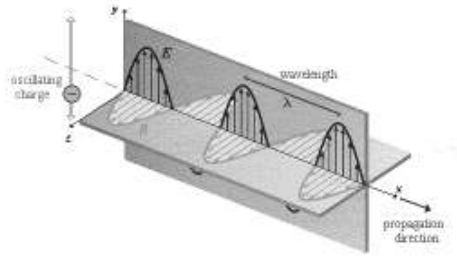
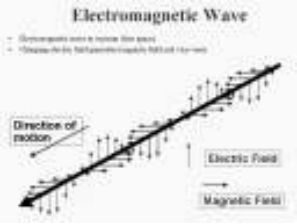
Light Introduction

Light -- an Electromagnetic Wave

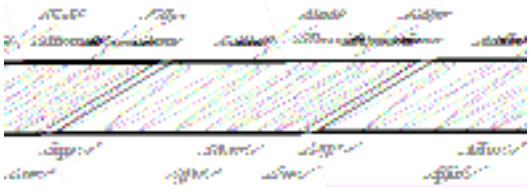


Electromagnetic Wave



- Transverse
- Traveling oscillating electric field and magnetic field
- Can travel through space
- Generated by accelerated charges
- Emitted by excited atoms when they return to ground state

Electromagnetic Spectrum



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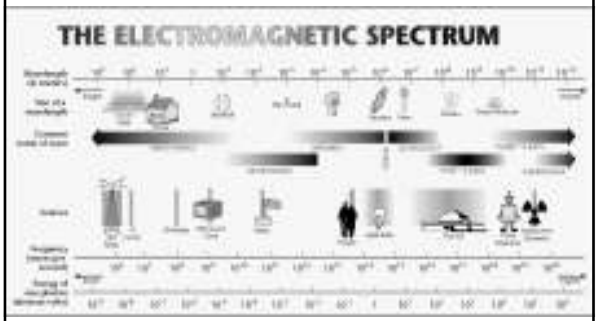

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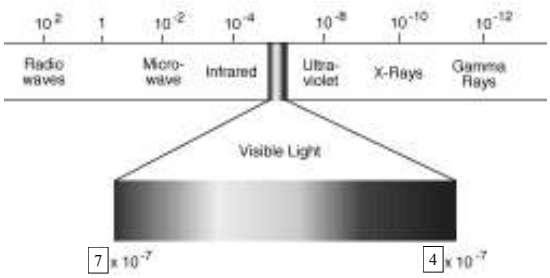
Visible Part of Spectrum



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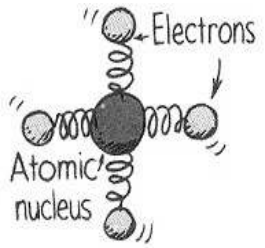
Spring Model



- Electrons can be modeled as particles connected to the atomic nucleus by springs
- Electrons of atoms in glass have certain natural frequencies of vibration

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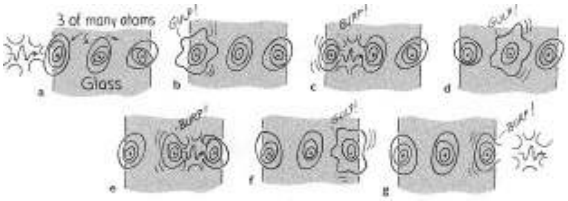
Light Transmission



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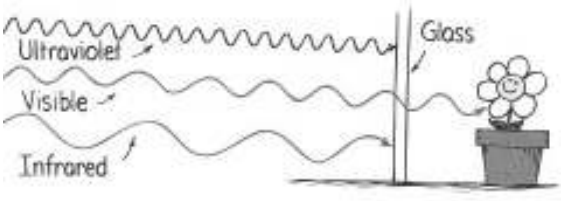
Glass Transparency



Ultraviolet matches natural frequency of electrons in glass

Infrared vibrates entire atom or molecule

Both result in warming of the glass

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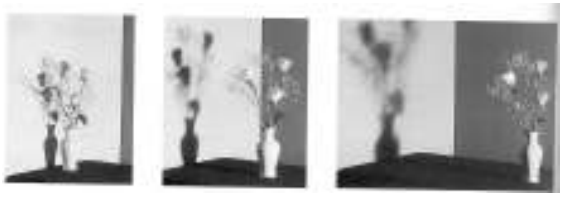
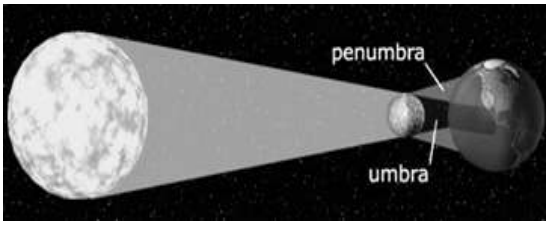
Opaque

- What does it mean for an object to be opaque?
- Light is absorbed without being re-emitted.

Umbra to Penumbra



Solar Eclipse



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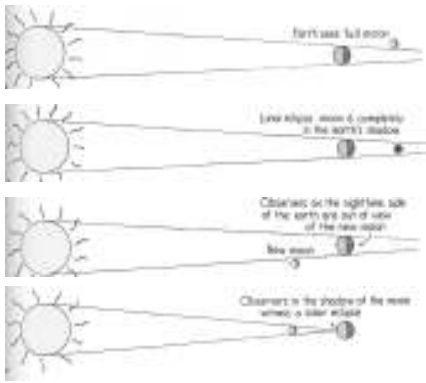

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