

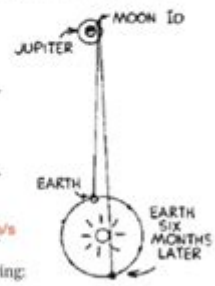
Name _____ Class _____ Date _____

Concept-Development Practice Page 27-1

Light

1. The Danish astronomer Olaus Roemer made careful measurements of the period of a moon about the planet Jupiter. How this data enabled a calculation of the speed of light is described in your textbook on pages 534 and 535.

- a. What is the diameter, in kilometers, of Earth's orbit around the sun?
300,000,000 km
- b. How much time is required for light to travel across the diameter of the orbit?
1000 s
- c. How do these two quantities determine the speed of light?
Speed = distance/time = (300,000,000 km)/(1000 s) = 300,000 km/s



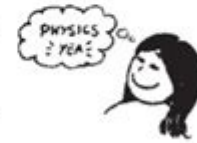
2. Study Figure 27.4 on page 536 in your textbook and answer the following:

- a. Which have longer wavelengths, radio waves or light waves?
Radio waves
- b. Which have longer wavelengths, light waves or gamma rays?
Light waves
- c. Which have higher frequencies, ultraviolet or infrared waves?
Ultraviolet waves
- d. Which have higher frequencies, ultraviolet waves or gamma rays?
Gamma rays



3. Carefully study Section 27.4 in your textbook and answer the following:

- a. Exactly what do vibrating electrons emit?
Energy that is carried in an electromagnetic wave
- b. When ultraviolet light shines on glass, what does it do to electrons in the glass structure?
Ultraviolet light causes electrons to vibrate in resonance with the ultraviolet light.
- c. When energetic electrons in the glass structure vibrate against neighboring atoms, what happens to the energy of vibration?
The energy of vibration becomes heat.
- d. What happens to the energy of a vibrating electron that does not collide with neighboring atoms?
The energy is emitted as light.



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