

Section  
**14-1**

HOLT PHYSICS

# Concept Review

## *Characteristics of Light*

1. The orbital radius of the Earth (the average Earth-Sun distance) is  $1.496 \times 10^{11}$  m. Mercury's orbital radius is  $5.79 \times 10^{10}$  m and Pluto's is  $5.91 \times 10^{12}$  m. Calculate the time required for light to travel from the Sun to each of the three planets. (Hint: Use  $3.00 \times 10^8$  m/s for the speed of light.)

- a. Sun-Earth \_\_\_\_\_
- b. Sun-Mercury \_\_\_\_\_
- c. Sun-Pluto \_\_\_\_\_

2. Typical wavelengths of visible light colors are listed below.

violet	blue	green	orange-yellow	red
420 nm	450 nm	550 nm	600 nm	700 nm

a. Calculate the frequency of the electromagnetic waves that carry these colors.

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b. How does frequency change when wavelength increases?

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c. Does the speed of light in air depend on frequency? on wavelength?

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