Chapter Review

USING KEY TERMS

Complete each of the following sentences by choosing the correct term from the word bank.

interference	radiation
scattering	opaque
translucent	transmission
electromagnetic wave	electromagnetic spectrum

1. _____ is the transfer of energy by electromagnetic waves.
2. This book is a(n) _____ object.
3. _____ is a wave interaction that occurs when two or more waves overlap and combine.
4. Light is a kind of _____ and can therefore travel through matter and space.
5. During _____, light travels through an object.

UNDERSTANDING KEY IDEAS

Multiple Choice

6. Electromagnetic waves transmit
   - **a.** charges.
   - **b.** fields.
   - **c.** matter.
   - **d.** energy.
7. Objects that transmit light easily are
   - **a.** opaque.
   - **b.** translucent.
   - **c.** transparent.
   - **d.** colored.
8. You can see yourself in a mirror because of
   - **a.** absorption.
   - **b.** scattering.
   - **c.** regular reflection.
   - **d.** diffuse reflection.
9. Shadows have blurry edges because of
   - **a.** diffraction.
   - **b.** scattering.
   - **c.** diffuse reflection.
   - **d.** refraction.
10. What color of light is produced when red light is added to green light?
    - **a.** cyan
    - **b.** blue
    - **c.** yellow
    - **d.** white
11. Prisms produce the colors of the rainbow through
    - **a.** reflection.
    - **b.** refraction.
    - **c.** diffraction.
    - **d.** interference.
12. Which kind of electromagnetic wave travels fastest in a vacuum?
    - **a.** radio wave
    - **b.** visible light
    - **c.** gamma ray
    - **d.** They all travel at the same speed.
13. Electromagnetic waves are made of
    - **a.** vibrating particles.
    - **b.** vibrating charged particles.
    - **c.** vibrating electric and magnetic fields.
    - **d.** All of the above

Short Answer

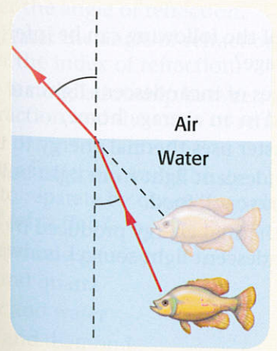
14. How are gamma rays used?
15. What are two uses for radio waves?
16. Why is it difficult to see through glass that has frost on it?

Math Skills

17. Calculate the time it takes for light from the sun to reach Mercury. Mercury is 54,900,000 km away from the sun.

CRITICAL THINKING

18. **Concept Mapping** Use the following terms to create a concept map: *light, matter, reflection, absorption,* and *transmission.*
19. **Applying Concepts** A tern is a type of bird that dives underwater to catch fish. When a young tern begins learning to catch fish, the bird is rarely successful. The tern has to learn that when a fish appears to be in a certain place underwater, the fish is actually in a slightly different place. Why does the tern see the fish in the wrong place?



20. **Evaluating Conclusions** Imagine that you are teaching your younger brother about light. You tell him that white light is light of all the colors of the rainbow combined. But your brother says that you are wrong because mixing different colors of paint produces black and not white. Explain why your brother's conclusion is wrong.
21. **Making Inferences** If you look around a parking lot during the summer, you might see sunshades set up in the windshields of cars. How do sunshades help keep the insides of cars cool?

INTERPRETING GRAPHICS

22. Each of the pictures below shows the effects of a wave interaction of light. Identify the interaction involved.

a.

b.

c.