Exploring Energy Study Guide

1. Which type of radiation has the largest mass? (chapter 10) alpha particle

2. Describe nuclear fission. splitting of the nucleus into smaller particles releasing energy

3. Describe nuclear fusion. merging nuclei with smaller masses to create one with a larger mass and release a large amount of energy

4. What is the amplitude of a wave? measure from the crest of the wave to the resting position

5. What happens to particles in a medium as a wave passes through it? they bob up and down and return to their original place

6. What happens during constructive interference? waves merger together becoming larger

7. Which type of mirror makes objects appear larger? concave

8. Describe refraction. bending of light as it passes through a medium

9. Why does an object appear black? it is absorbing all color frequencies

10. What color is produced when all colors in the CMY process are combined? black

11. What happens when heat moves into a substance? kinetic energy of the molecules increases

12. Describe thermal expansion. Give examples. particles move faster and further part causing things to expand. heating a metal jar lid will help loosen it from the glass jar.

13. What do we call the complete range of wavelengths of light? electromagnetic spectrum

14. Describe a prism. triangular piece of glass or plastic that separates white light into colors

Describe diffraction grating. a piece of glass, plastic, or metal with many, thin parallel slits that separates white light into colors

15. Describe convection, conduction and radiation. Give examples of each.

convection – transfer of heat by density in a fluid, convection currents in the mantle, air circulation

conduction – transfer of heat by touching, hot soup heats a metal spoon

radiation – transfer of heat through open space, heat from a fire/ from sun

16. Why do we hear an echo of a sound? Sound waves are reflected off a surface

17. How are amplitude of sound and its volume related? as one increases, the other increases

18. List the parts of the electromagnetic spectrum in order from LARGEST wavelength to SMALLEST wavelength.

radio waves, microwaves, infrared waves, visible light, ultraviolet light, X rays, gamma rays

19. Name the two color processes, state if it additive or subtractive mixing, and list the primary colors.

RGB is additive color process, the primary colors are red, green, blue

CMY is a subtractive color process, the primary colors are cyan, magenta, and yellow

20. What do we call tiny solid particles that provide color? pigments

21. What is visible light? light waves that can be seen with the naked eye

22. Describe materials that are transparent, translucent, and opaque

transparent – allows light to pass through

translucent – allows some light to pass through

opaque – no light passes through

23. What are primary colors? those which are not produced by mixing colors

Secondary colors? produced by blending primary colors

24. What is temperature? the measure of the average amount of kinetic energy of the atoms in a material

25. What is a lens? a curved piece of transparent material

26. What is the Doppler Effect? the change of a sounds pitch if its source or recipient is in motion

27. What is the frequency of a wave? a measure of how many wave crests or troughs pass a given point in one unit of time

28. What is specific heat? the amount of heat energy needed to raise the temperature of one gram of a substance by 1⁰ C

29. What is the pitch of a sound? how high or low a sound is

30. Explain why you can hear people talking even after they walk around the corner of a building.

Sound waves reflect off of nearby objects and sound waves change directions

31. Should a nearsighted person wear convex or concave lenses to correct her vision? Why?

They should wear a concave lens because they spread light rays before they reach the eyes enabling a person to see distant objects.

32. Assuming they both have the same temperature, which has more thermal energy a bathtub of water or a teacup? Why? The bathtub because there are more total molecules