**Waves Test Study Guide (Units 3, 4, and 5)**

1. What is a wave?
2. What is a medium?
3. What is the difference between a mechanical and an electromagnetic wave?
4. In a transverse wave, how do the medium/whole wave energy move?
5. In a longitudinal wave, how do the medium/whole wave energy move?
6. What is a compression?
7. What is a rarefaction?
8. What is the wavelength of a longitudinal vs transverse wave?
9. Draw a longitudinal wave and label compression and rarefaction regions as well as the wavelength.
10. How do we find the amplitude of a transverse wave?
11. What is a crest?
12. What is a trough?
13. What is the frequency of a wave?
14. What units do we measure frequency in?
15. Draw a transverse wave and label the wavelength, amplitude, crest, trough, frequency, etc.
16. Is a sound wave a mechanical or electromagnetic wave?
17. If a wave is traveling at a certain speed, and you cut its frequency in half, what will happen to its wavelength?
18. Is a light wave a mechanical or electromagnetic wave?
19. What is refraction?
20. What is reflection?
21. What is absorption?
22. What is opaque?
23. What is transparent?
24. What is translucent?
25. Why do we see black as a color?
26. Why do we see white as a color?
27. What is an echo?
28. What is sound interference? (constructive and destructive)
29. Which media allows sound to travel faster?
30. What is pitch?
31. How do amplitude and loudness relate?
32. How do we see color? (i.e. how is a red apple red?)
33. If my pitch is high, what are the wavelength and frequency like?
34. What unit do we measure wavelength in?
35. What is the wave speed formula?
36. Where does most of the visible light on Earth come from?
37. Our eyes interpret different wavelengths of light as what?
38. What are the shortest wavelengths of color?
39. What are the longest wavelengths of color?
40. What is the full range of wavelengths called?
41. What are the seven sections of the electromagnetic spectrum?
42. Which section of the EM spectrum has the longest wavelengths?
43. Which section of the EM spectrum has the shortest wavelengths?
44. What is the Doppler Effect?
45. What is the difference between a rarefaction, refraction, and reflection?
46. What kind of relationship is it when one thing goes up and the other goes down? (i.e. when the wavelength is doubled and the frequency reduces by half)
47. Sound travels fastest though what kind of medium? (solid, liquid, or gas)
48. A wave has a wavelength of 20 meters is moving at a speed of 100 m/s. What is its frequency?
49. A wave with a frequency of 10 Hz has a wavelength of 3 meters. At what speed will this wave travel?

**Waves Test Study Guide (Units 3, 4, and 5) key**

1. What is a wave? A disturbance of energy
2. What is a medium? The material a wave travels through
3. What is the difference between a mechanical and an electromagnetic wave? A mechanical wave has to travel through a medium whereas an electromagnetic wave does not. An electromagnetic wave CAN travel through a medium, but can also travel through the vacuum of space.
4. In a transverse wave, how do the medium/whole wave energy move? The medium moves perpendicular to the wave energy
5. In a longitudinal wave, how do the medium/whole wave energy move? The medium moves parallel to the wave energy
6. What is a compression? The area in a longitudinal wave where the particles are close together
7. What is a rarefaction? The area in a longitudinal wave where the particles are spread apart
8. What is the wavelength of a longitudinal vs transverse wave? Wavelength in a longitudinal wave is measured from compression to compression or rarefaction to rarefaction whereas wavelength in a transverse wave is measured from crest to crest or trough to trough. (Or from any two identical points)
9. Draw a longitudinal wave and label compression and rarefaction regions as well as the wavelength.

Answers will vary

1. How do we find the amplitude of a transverse wave? The amplitude of a transverse wave is measured from midpoint to crest or midpoint to trough
2. What is a crest? The highest point on a transverse wave
3. What is a trough? The lowest point on a transverse wave
4. What is the frequency of a wave? The number of cycles that pass a certain point in a certain period of time (usually 1 second)
5. What units do we measure frequency in? Hertz
6. Draw a transverse wave and label the wavelength, amplitude, crest, trough, frequency, etc.

Answers will vary

1. Is a sound wave a mechanical or electromagnetic wave? Mechanical
2. If a wave is traveling at a certain speed, and you cut its frequency in half, what will happen to its wavelength? The wavelength will double
3. Is a light wave a mechanical or electromagnetic wave? Electromagnetic
4. What is refraction? The bending of light
5. What is reflection? Light bounces back off of an object
6. What is absorption? Light or sound is taken in by an object
7. What is opaque? No light passes through an object—you cannot see through it.
8. What is transparent? All light passes through an object—you can see clearly through it.
9. What is translucent? Some light passes through an object—you can see through it, but the objects may appear distorted or fuzzy (not clear).
10. Why do we see black as a color? All light is absorbed
11. Why do we see white as a color? All light is reflected
12. What is an echo? When sound is reflected by an object
13. What is sound interference? (constructive and destructive) When two waves come together to form 1. These waves can either build up to create a larger wave (constructive) or they can work against each other to cancel out the wave (destructive)
14. Which media allows sound to travel faster? Solids
15. What is pitch? The highness or lowness of a sound—determined by frequency
16. How do amplitude and loudness relate? The higher the amplitude, the louder the sound.
17. How do we see color? (i.e. how is a red apple red?) Red would be reflected while all other colors are absorbed.
18. If my pitch is high, what are the wavelength and frequency like? Wavelength is short and frequency is high
19. What unit do we measure wavelength in? meters
20. What is the wave speed formula? Wave speed = wavelength x frequency
21. Where does most of the visible light on Earth come from? The sun
22. Our eyes interpret different wavelengths of light as what? colors
23. What are the shortest wavelengths of color? Violet
24. What are the longest wavelengths of color? Red
25. What is the full range of wavelengths called? Electromagnetic Spectrum
26. What are the seven sections of the electromagnetic spectrum? Radio waves, Microwaves, Infrared Rays, Visible light, Ultraviolet light, X rays, and Gamma rays.
27. Which section of the EM spectrum has the longest wavelengths? Radio waves
28. Which section of the EM spectrum has the shortest wavelengths? Gamma Rays
29. What is the Doppler Effect? The perceived pitch changes based on a moving object’s distance from you.
30. What is the difference between a rarefaction, refraction, and reflection? Rarefaction= part of a longitudinal wave where the particles are far apart. Refraction= The bending of light. Reflection= When light bounces off an object.
31. What kind of relationship is it when one thing goes up and the other goes down? (i.e. when the wavelength is doubled and the frequency reduces by half) Inverse relationship
32. Sound travels fastest though what kind of medium? (solid, liquid, or gas) Solid
33. A wave has a wavelength of 20 meters is moving at a speed of 100 m/s. What is its frequency? 50 Hz
34. A wave with a frequency of 10 Hz has a wavelength of 3 meters. At what speed will this wave travel? 30 m/s