FLINN SCIENTIFIC

Name____

Visible Waves Worksheet

Transverse Wave

Describe the wave motion.

Does the size of the transverse wave change as it travels along the spring?

What happens to the wave as the spring is stretched further?

What happens to the wave when it reaches the end of the spring?

Longitudinal Waves

Describe the wave (pulse) motion.

Does the size of the longitudinal wave change as it travels along the spring?

What happens to the wave as the spring is stretched further?

What happens to the wave (pulse) when it reaches the end of the spring?

Name____

Transverse Wave Visualizer Worksheet

1. How do the speeds of the wave fronts (red line) compare?

2. Is the transverse (up and down) motion of the red mark the same for each wave?

3. What is the relationship between the wavelength and the transverse motion of the red mark (frequency)?

Name____

Simulated Double-Slit Interference Worksheet

Pattern	Point Source Separation	Angle of First-Order Band	Angle of Second-Order Band	Wavelength of Point Source (measured)
A				
B				

1. Calculate the “wavelength” of the point source for Pattern A using the first-order data.

2. Calculate the “wavelength” of the point source for Pattern A using the second-order data.

3. Calculate the position of the first-order maximum for Pattern B using one of the slit separations chosen during the lab.

4. Calculate the position of the second-order maximum for Pattern B using the same slit separation chosen in Question #3.

5. Radio signals (approximately 3 m wavelengths) have the ability to “bend” around buildings so that a radio station can be heard throughout a city. In contrast, visible light waves (approximately 500-nm wavelengths) do not bend around buildings (the building casts a shadow). Why would electromagnetic radio signals bend (diffract) around buildings better than visible light? *Hint:* Refer to Equation 1.

6. Was an interference pattern created when Pattern A and Pattern B were used together? Explain.

Name____

Resonance Tube Worksheet

Tuning Fork Frequency	Resonance Tube Type	Resonating Tube Length
512 Hz	Open-Open	
426 Hz	Open-Open	
512 Hz	Closed-Open	
426 Hz	Closed-Open	

Post-Lab Questions

1. How long is the fundamental wavelength of the sound resonating in the open-open resonance tube?

2. How long is the fundamental wavelength of the sound resonating in an open-closed resonance tube?

3. Calculate the speed of sound in air using the data from the open-open resonance tube.

4. Calculate the speed of sound in air using the data from the closed-open resonance tube.

5. How do the lengths of the resonating tubes and the speed of sound calculations compare to the calculations and given value in the *Pre-Lab Questions*? What factors could attribute to any variations?

Name____

Singing Rods Worksheet

Observations

Part I. Singing Rods

Aluminum rod, thick, 24"

Aluminum rod, thin, 24"

Aluminum tube, 24"

Aluminum rod, thick, 18"

Part II: Doppler Effect

Post-Lab Questions

1. Why do the aluminum rods resonate and "sing" when they are rubbed with the rosin? What is the purpose for the rosin?

2. At what point on the aluminum rod does the sound appear to be produced?

3. Why must the aluminum rod be held in the middle in order for resonance to occur? Are there any other positions where the aluminum rod can be held that produces resonance?

4. Compare the sounds produced by the four "singing rods."

5. Define the Doppler effect.

6. Explain why the sound of the "singing rod" changes when the rod is rotated forward and back.