Questions

1. Calculate the width of the central maximum in the diffraction pattern from the single slit with width 0.04mm, if the screen were placed 5.00 m away from the slit. Use the accepted λ for the laser light. Proportional reasoning makes this very easy.

2. If you had used yellow sodium light (λ = 5890 Å), what would you have found for the fringe spacing in the interference pattern on a screen 3.00 m away, using the following pairs of double slits?

# of Slits	2	2	2	2
Slit Width	0.04 mm	0.04 mm	0.08 mm	0.08 mm
Slit Spacing	0.250 mm	0.500 mm	0.250 mm	0.500 mm
Fringe Spacing				

DATA SHEET FOR EXPERIMENT #9

Name _____ **Partner** _____

A. Describe carefully what happens when you vary the separation of the double slit.

B. Quantitative work with double slits. Fill out the table and show your calculations.

Distance between slits and screen, L: _____

Slit Width, 'a'	Slit Separation, 'd'	separation of pencil marks	# fringe widths	Δx_d	Calculated λ
0.04 mm	0.250 mm				
0.04 mm	0.500 mm				
				Average λ	
				Accepted λ	6328 Å
				% difference	

C. Calculate the width of the double slits. Fill out the table and show your calculations below. Also, describe carefully what happens when you vary the slit width of the double slits.

λ: 6328 Å L: _____ Slit Separation, 'd', = 0.500 mm

separation of pencil marks	# fringe widths	Δx_s	Given Slit Width, 'a'	Calculated Slit Width, 'a'	% Difference
			0.04 mm		

D. Variable single slit – qualitative work. Describe the change in the diffraction pattern that results from increasing its width, a. What differences from the double slit interference pattern do you notice?

E. Quantitative work with single slits: Fill out the table and show your calculations below:

λ: 6328 Å L: _____

separation of pencil marks	# fringe widths	Δx_s	Given slit width	measured slit width	% difference
			0.08 mm		
			0.04 mm		