

Physical Double Slit Model

1. Set up the physical double slit model by placing the “Double Slit Experiment” printout on top of the piece of cardboard or foamboard.
2. Pick out two identical transverse waveform transparencies and, using sewing pins, attach them to the print out by poking the pins through the straws into the formboard at the locations marked on the printout. In doing this step, you must ensure that the waves are “coherent” by flipping the straws until each wave starts with a wave crest or wave trough.
3. Pinching the transparencies together across the page on the solid line, find the position on the line where both waveforms would meet and constructively interfere. This will look like two transparencies perfectly overlaid with crests matching crests and troughs matching troughs. Mark this location with an “X” on the line.
4. Find any other locations along the solid line that would experience constructive interference and mark an “X” in these locations as well.
5. Overlap the transparencies in a location halfway between two “X”es. Describe what the wave combination looks like at this location.

6. With the small angle approximation, the double slit formula simplifies to

$$s = \frac{D\lambda}{d}$$

Where s = fringe spacing, D = distance between slits and screen, d = distance between slits, and λ = wavelength.

7. Using a ruler, measure and annotate the distances for s , D , and d on the “Double Slit Experiment” handout
8. Use the measurements to calculate the wavelength of the wave.
9. With the ruler measure the actual wavelength of the waveform transparency used and calculate the percent error of your calculated approximation
10. Complete steps 2-9 for at least 1 other set of transverse transparencies

Double Slit Experiment



Place pins here