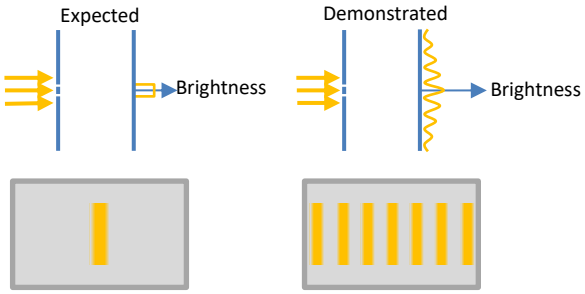
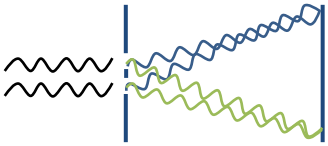
CONCEPT: YOUNG'S DOUBLE SLIT EXPERIMENT

- A beam of light shown onto a double slit was thought to produce a single spot of brightness
  - However, when this experiment is performed, this is not the case
  - What happens is there are multiple bright spots



  - This diffraction pattern is due to _____

- Each slit produces a light ray in every direction
  - Some light rays constructively interfere → [DARK / BRIGHT] FRINGES
  - Some light rays destructively interfere → [DARK / BRIGHT] FRINGES

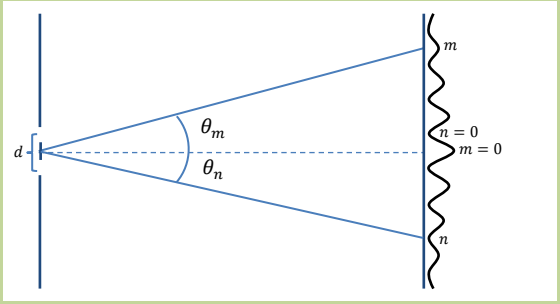


- The BRIGHT FRINGES are located at angles given by

$\sin\theta_m =$ _____ for $m = 0, 1, 2, 3, \ldots$

- The DARK FRINGES are located at angles given by

$\sin\theta_n =$ _____ for $n = 0, 1, 2, 3, \ldots$



EXAMPLE: A 650 nm laser is shown through a double slit of 10 mm separation. What angle is the 4th brightest fringe located at? If the double slit is 2.8 m from the screen, how far from the brightest fringe is the 4th brightest?

PRACTICE: WIDTH OF BRIGHT FRINGES

A 450 nm laser shines light through a double slit of 0.2 mm separation. If a screen is placed 4 m behind the double slit, how wide are the bright fringes of the diffraction pattern?

EXAMPLE: UNKNOWN WAVELENGTH OF LASER THROUGH DOUBLE SLIT

A laser of unknown wavelength shines monochromatic light through a double slit of 0.2 mm separation. If a screen is 5.5 m behind the double slit, you find the angular separation of each bright fringe to be 0.15^{o}. What is the wavelength of the laser?