Answer on Question#37523 - <Physics> - <Other>

Choose the correct statement regarding a double slit experiment.
If the light wavelength becomes shorter, then the interference fringes move closer together.
If the light wavelength becomes longer, then the interference fringes move closer together.
If the slit distance is decreased, then the interference fringes move closer together.
If the slit distance is increased, then the interference fringes move further apart.
If the light wavelength becomes shorter, then the interference fringes move further apart.

Solution:

Equation of the interference:

$$\frac{d \cdot \Delta l}{L} = \lambda$$

$$, \text{where } \lambda - \text{wavelength}, L - \text{distance to the screen}, \Delta l$$
$$- \text{width of the interference fringe}$$

Hence, only the first statement is correct: If the light wavelength becomes shorter, then the interference fringes move closer together.

$$(\lambda \searrow \Rightarrow \quad \Delta l \searrow)$$

Others statement are incorrect.

Answer: correct statement: If the light wavelength becomes shorter, then the interference fringes move closer together.