

In case A, two equal and opposite charges are separated by a distance d . Case B is identical to case A except that a neutral metal cube has been placed between the two charges. Four students are comparing the electric force on the positive charge in the two cases:

Alicia: *“Since the block is a conductor, it lets more charge travel between the point charges. The force will be stronger.”*

Boris: *“The electric field inside of a conductor is zero. So the metal cube blocks the electric force on the positive charge by the negative charge. There might be some field lines that still attract the positive charge by going around the metal cube, but the force is much smaller in case B.”*

Cody: *“If the cube is a perfect conductor, they will be equal, since then the cube would not interfere at all with the charge. Otherwise the force would be greater in case A.”*

Delia: *“B is greater than A. The cube is a conductor! It is as if the distance in the cube ‘wasn’t there’ because of the permittivity constant of the metal cube.”*

Which of these students is correct?

