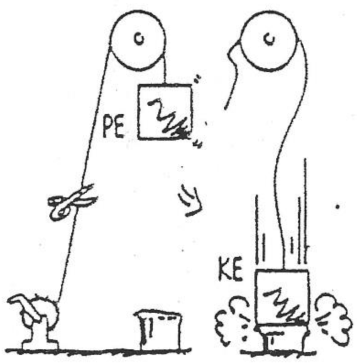
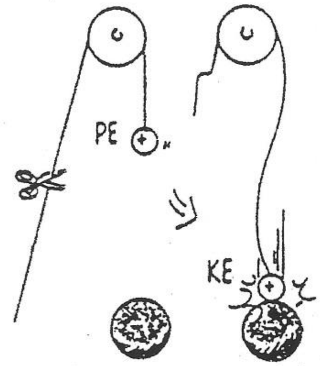
Physics | Electric Potential | Mr. McMullen

Name ________________________________ Date ________________ Period _______

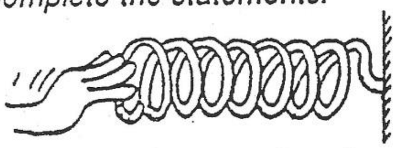


Just as PE transforms to KE for a mass lifted against the gravitation field (left), the electric PE of an electric charge transforms to other forms of energy when it changes location in an electric field (right). In both cases, how does the KE acquired compare to the decrease in PE?

____



Complete the statements.



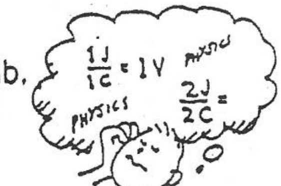
A force compresses the spring. The work done in compression is the product of the average force and the distance moved. W = Fd. This work increases the PE of the spring.

Similarly, a force pushes the charge (call it a test charge) closer to the charged sphere. The work done in moving the test charge is the product of the average ____________and the ______________ moved. W = ______. This work ____________ the PE of the test charge.

If the test charge is released, it will be repelled and fly past the starting point. Its gain in KE at this point is ____________ to its decrease in PE.

At any point, a greater amount of test charge means a greater amount of PE. But not a greater amount of PE *per amount* of charge. The quantities PE (measured in joules) and PE/charge (measured in volts) are different concepts.

By definition: Electric Potential = PE/charge. 1 volt = 1 joule/1 coulomb. So 1 C of charge with a PE of 1 J has an electric potential of 1 V. And 2 C of charge with a PE of 2 J has an electric potential of _________V.



If a conductor connected to the terminal of a battery has an electric potential of 12 V, then each coulomb of charge on the conductor has a PE of __________J.

You do very little work in rubbing a balloon on your hair to charge it. The PE of several thousand billion electrons (about one-millionth coulomb [10^{-6}C]) transferred may be a thousanth of a joule [10^{-3}J]. Impressively, however, the electric potential of the balloon is about _________V!

Why is contact with a balloon charged to thousands of volts not as dangerous as contact with household 110 V? ____

____