

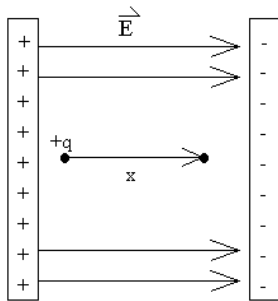
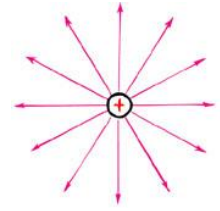
Name _____ Date _____ Period _____

Electric Fields - Problem Set 1

1. A positive test charge of $6.5 \times 10^{-6} \text{ C}$ experiences a force of $4.5 \times 10^{-5} \text{ N}$.

What is the magnitude of the electric field intensity?

2. A charge experiences a force of $3.0 \times 10^{-3} \text{ N}$ in an electric field of intensity 2.0 N/C . What is the magnitude of the charge?



3. An electric field intensity 150 V/m exists between two plates separated by 4.0 m . What is the potential difference between the plates?

4. A potential difference of 0.90 V exists from one side to other of a cell membrane that is $5.0 \times 10^{-9} \text{ m}$ thick. What is the electric field across the membrane?

5. A spark will jump between you and another person if the electric field exceeds $4.0 \times 10^6 \text{ V/m}$. You shuffle across a rug and a spark jumps when you put your finger 0.15 cm from another person's arm. Calculate the potential difference between your body and the other person's arm.



6. An oil drop carries a charge of three electrons and is balanced in a field of intensity $5.0 \times 10^4 \text{ N/C}$. If the charge on the electron is $1.6 \times 10^{-19} \text{ C}$, what is the weight of the oil drop?



7. An oil drop weighs $5.8 \times 10^{-14} \text{ N}$. It is suspended in an electric field intensity of $6.0 \times 10^4 \text{ N/C}$.

a. What is the charge on the drop?

b. If the particle is negative, how many excess electrons does it carry?

8. It takes $5.5 \times 10^{-17} \text{ J}$ of work to raise the potential of a charge of $3.2 \times 10^{-6} \text{ C}$. What is the potential of this charge?

