Electric Field and Charge Movement

"And he looked, and saw a well in the field; and behold, there were three flocks of sheep lying by it; for out of that well they watered the flocks." Genesis 29:2

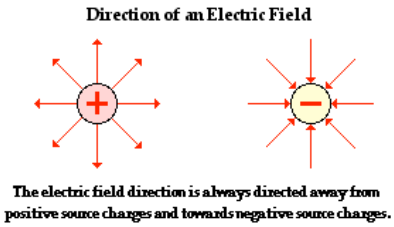
- The flow of charge through wires allows us to cook our food, light our homes, air-condition our work and living space, entertain us with movies and music and even allows us to drive to work or school safely.

- Even though electrons can move as a result of contact between objects, electric force is described as a non-contact force. A charged balloon can have an attractive effect upon an oppositely charged balloon even when they are not in contact. The electric force acts over the distance separating the two objects. Electric force is an action-at-a-distance force.

- Action-at-a-distance forces are sometimes referred to as field forces. The space surrounding a charged object is affected by the presence of the charge; an electric field is established in that space. A charged object creates an electric field.

- Whether a charged object enters that space or not, the electric field exists. Space is altered by the presence of a charged object; other objects in that space experience the strange and mysterious qualities of the space. As another charged object enters the space and moves *deeper and deeper* into the field, the effect of the field becomes more and more noticeable.

- Electric field is a vector quantity whose direction is defined as the direction that a positive test charge would be pushed when placed in the field. Thus, the electric field direction about a positive source charge is always directed away from the positive source. And the electric field direction about a negative source charge is always directed toward the negative source.



- To move a charge in an electric field against its natural direction of motion would require work. The natural direction of motion of an object is from high energy to low energy; but work must be done to move the object in the opposite direction from where it would naturally go.
- Moving a positive test charge against the direction of an electric field is like moving a mass upward within Earth's gravitational field.
- Potential energy is the stored energy of position of an object and it is related to the location of the object within a field.