* **Field Lines:** Imaginary lines used to visualize the direction and strength of an electric field.
* **Electric Field Strength (E):** A vector quantity measured in Newtons per Coulomb (N/C). It indicates the force per unit charge experienced by a test charge placed in the field.
* **Electric Potential (V):** A scalar quantity measured in volts (V). It represents the potential energy per unit charge at a point in the electric field.

Examples of Electric Fields

* **Around a single point charge:** The field lines radiate outward from a positive charge and inward towards a negative charge.
* **Between two oppositely charged plates:** The field lines are uniform and parallel, pointing from the positive plate to the negative plate.
* **Around a dipole:** A dipole consists of two equal and opposite charges separated by a small distance. The field lines form a pattern that resembles a horseshoe.

Applications of Electric Fields

* **Electrostatic attraction and repulsion:** The force between charged objects.
* **Electric motors:** Use magnetic fields generated by electric currents to produce rotational motion.
* **Electrostatic precipitators:** Remove dust and other particles from air using an electric field.
* **Van de Graaff generators:** Produce high voltages using electric fields.

Key Equations

* **Electric Field Strength:** $E = F/q$, where F is the force on a charge q.
* **Electric Potential:** $V = W/q$, where W is the work done to move a charge q from a reference point to a point in the field.
* **Relationship between Electric Field and Potential:** $E = -dV/dr$, where dr is the displacement along the direction of the field.

Conclusion

Electric fields are fundamental to our understanding of electricity and electromagnetism. They play a crucial role in various phenomena and have numerous applications in science, technology, and everyday life.