

# Electromagnetism

Enduring Understanding - All electric and magnetic phenomena are due to the motion of charged particles.

**Electrostatics**  
The interactions of charged particles with electric fields.

**Circuits**  
The movement of charged particles in an electric circuit. (Next Unit)

**Magnetism**  
The interactions of charged particles with magnetic fields. (Next Unit)

**Essential Question**  
How does an object acquire a positive charge?

Methods of Charging

Conduction  
Induction  
Separation of Charge

Electrons Move

**Essential Question**  
What is quantized?

Quantization  
 $Q = Ne$

**Essential Question**  
What are the similarities and differences between electrostatic and gravitational forces?

Electrostatic Force

Coulomb's Law  
 $F_E = \frac{kq_1q_2}{r^2}$  or  $\frac{kq_1q_2}{d^2}$

Quantitative Problems

Qualitative Problems

Coulomb's Law Problem

**Essential Question**  
How will a charge move in an electric field?

Electric Fields

Rules for Field Lines

How charges interact with E Fields

Field Line Drawings

Point Charge  
2 Point Charges  
Parallel Plates

Equation  
 $E = \frac{F_E}{q}$

Equation  
 $E = \frac{kQ}{r^2}$

**Essential Question**  
Is voltage an absolute or relative quantity?

Electric Potential  
 $V = \frac{W}{q}$

**BOLD lined boxes mean Pre-AP ONLY**

