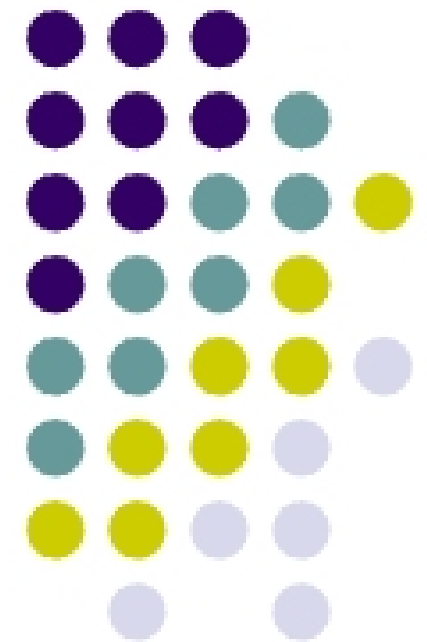


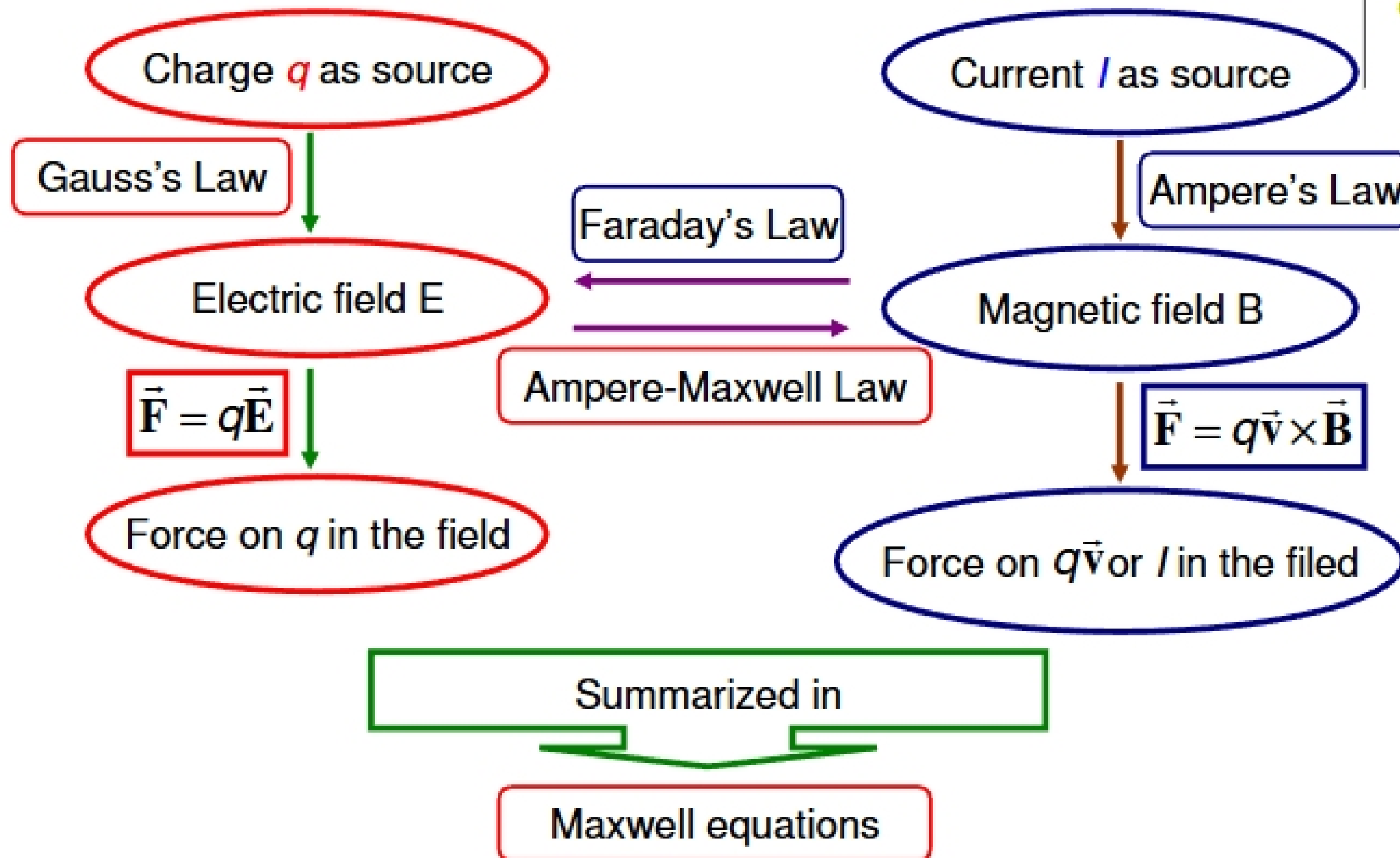
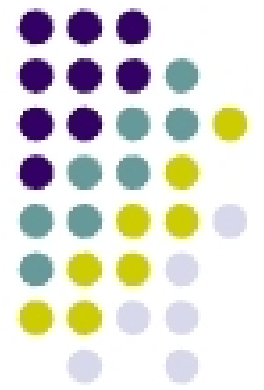
Chapter 29

Magnetic Fields

1. Introduction to magnetic field.
2. The forces on moving charges and currents inside a magnetic field.
3. The math that will be needed is vector product.
4. The source of magnetic field will be discussed in later chapters.



A whole picture helps



Math

Vector cross product: $\vec{C} = \vec{A} \times \vec{B}$

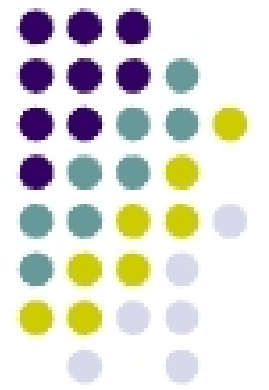
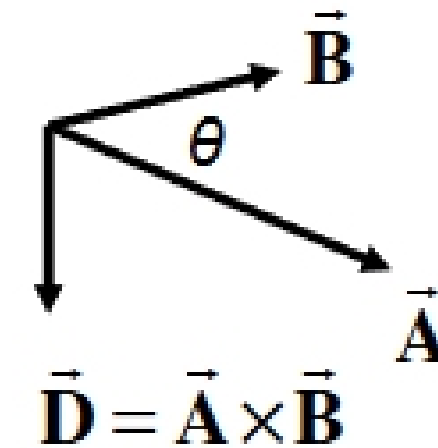
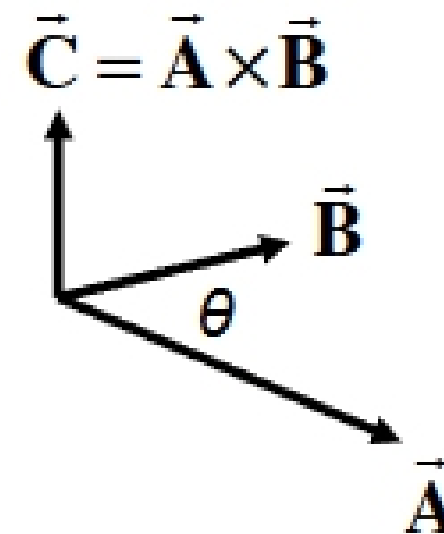
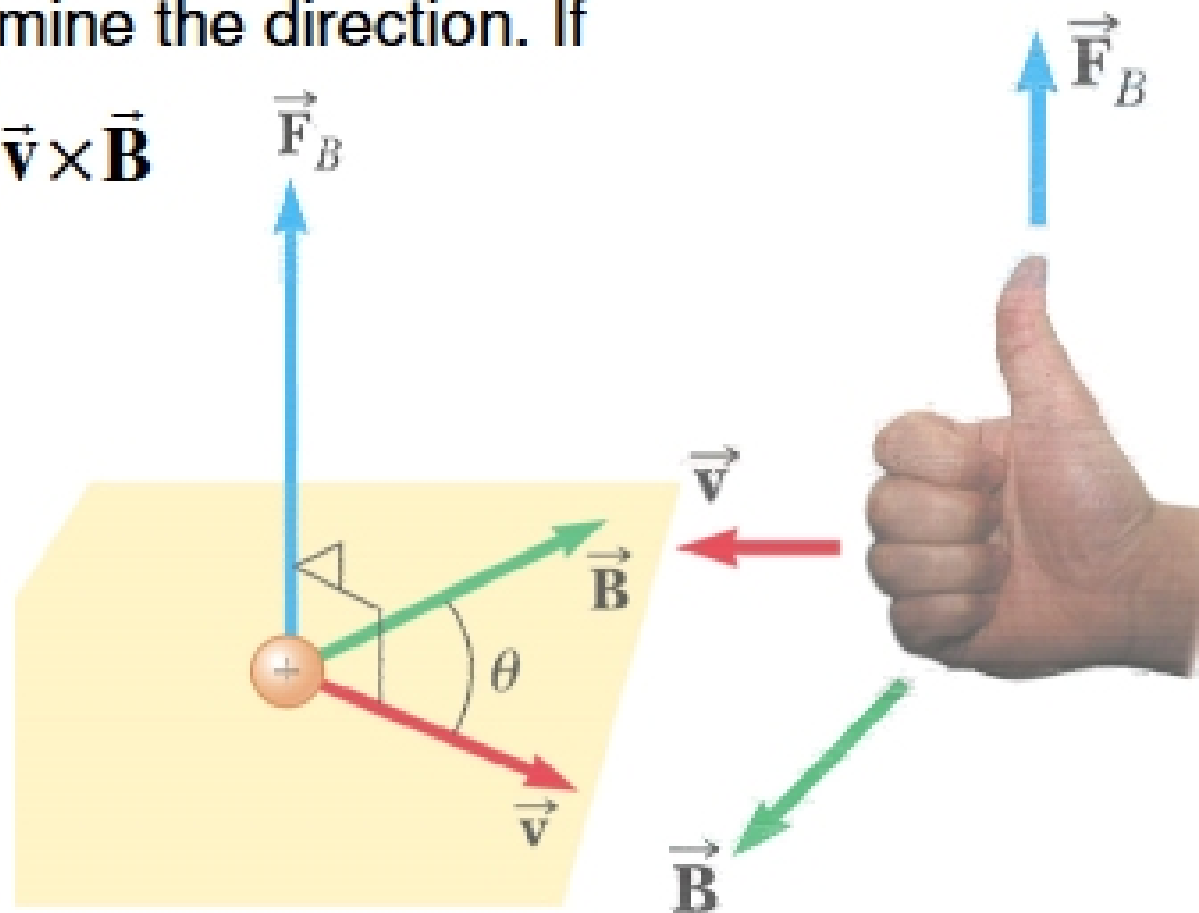
Magnitude of the vector \vec{C} :

$$C \equiv |\vec{C}| = AB \sin(\theta)$$

Vector cross product: $\vec{D} = \vec{B} \times \vec{A} = -\vec{C}$

Determine the direction. If

$$\vec{F}_B = \vec{v} \times \vec{B}$$



The right-hand rule:

1. Four fingers follow the first vector.
2. Bend towards the second vector.
3. Thumb points to the resultant vector.