

## CONCEPT: COULOMB'S LAW

- **Coulomb's Law** is used to determine the \_\_\_\_\_ and \_\_\_\_\_ forces between a pair of charged particles.
  - Using Coulomb's Law Formula allows you to determine the potential energy (E) between the particles.
    - Potential energy is \_\_\_\_\_ proportional to the charges of the particles.
    - Potential energy is \_\_\_\_\_ proportional to the distance between particles.
    - The  $\uparrow$  the potential energy then the \_\_\_\_\_ the ionic bond.

### Coulomb's Law

Coulomb's Law Formula

$$E = e \cdot \frac{Q_1 Q_2}{r}$$

- $E =$  \_\_\_\_\_ Energy or Force in N.
- $e =$  Permittivity Constant = \_\_\_\_\_ in  $\frac{N \cdot m^2}{C^2}$ .
- $Q_1 =$  Charge of Particle \_\_\_\_\_ in C or absolute charge.
- $Q_2 =$  Charge of Particle \_\_\_\_\_ in C or absolute charge.
- $r =$  \_\_\_\_\_ between ion centers in m.

- Recall, that the absolute charge of an ion = \_\_\_\_\_.

**EXAMPLE:** A charge of  $+4.13 \times 10^{-19}$  C is placed  $8.03 \times 10^{-7}$  m apart from another charge of  $-3.37 \times 10^{-17}$  C. What is the force of attraction between the charged particles?

**PRACTICE:** A force of  $3.24 \times 10^{-12}$  N exists between a +3 charge and another charged particle. The ions are  $2.53 \times 10^{-8}$  m apart. What is the charge of the unknown charged particle? (Rework numbers since you went from +15 to +3)