

AP Physics 2

Name: _____ Score: _____

1. Two negative charges are placed near each other. They will:
☐ attract
☐ repel
☐ do nothing
☐ combine into a positive charge
2. In ordinary charging, which particles actually move between objects?
☐ protons
☐ electrons
☐ neutrons
☐ whole atoms
3. A 2 C charge sits in a field of $5 \frac{\text{N}}{\text{C}}$. What force does it feel, in N?
_____ N
4. Two +1 C charges are 2 m apart ($k = 9 \times 10^9$). What is their potential energy, in J? (Give the coefficient of 10^9 .)
_____ $\times 10^9$ J
5. How much energy is needed to move a 2 C charge through a potential difference of 6 V? Answer in J.
_____ J
6. A 2 F capacitor is charged to 3 V. How much charge does it store, in C?
_____ C
7. A 2 C charge accelerates from rest through 9 V. How much kinetic energy does it gain, in J?
_____ J
8. A positively charged object has:
☐ gained protons
☐ lost electrons
☐ gained neutrons
☐ lost protons
9. The electric field at a point is defined as:

- ☐ force times charge
- ☐ force per unit charge
- ☐ charge per unit force
- ☐ charge times distance

10. Electric potential energy between two point charges depends on distance as:

- ☐ $1/r^2$
- ☐ $1/r$
- ☐ r
- ☐ r^2

AP Physics 2

1. **repel**

Like charges repel — two negatives push apart.

2. **electrons**

Electrons transfer; protons stay locked in the nuclei.

3. **10 N**

$$F = qE = 2 \times 5 = 10 \text{ N.}$$

4. **$4.5 \times 10^9 \text{ J}$**

$$U = kq_1q_2/r = 9 \times 10^9/2 = 4.5 \times 10^9 \text{ J.}$$

5. **12 J**

$$W = q\Delta V = 2 \times 6 = 12 \text{ J.}$$

6. **6 C**

$$Q = CV = 2 \times 3 = 6 \text{ C.}$$

7. **18 J**

$$\text{KE} = q\Delta V = 2 \times 9 = 18 \text{ J.}$$

8. **lost electrons**

A positive object has lost electrons, leaving more protons than electrons.

9. **force per unit charge**

$E = F/q$ — the force a unit positive charge would feel.

10. **$1/r$**

$U = kq_1q_2/r$ falls as $1/r$ — one power, unlike the $1/r^2$ force.