

Unit 12 Plan: **Electric Fields**
 Physics1 Honors @ PalmHarborUniversityHigh



Day	Date	Topic	Assignments Due / Schedule
1		Understanding Electricity Video	
2		Chapter 21.1 Notes on Electric Fields CW#1: p 565:1,2,3 ; p 566: 6-10	Read Section 21.2
3		Review 21.1 Van de Graaff demos	HW#1: (p.585) : 66,67,69,71,74
4		Electric Potential Notes CW#2: (p 571-578: 16,18,20,21,22,30,31,32,39)	
5		Mechanical Universe Video	HW#2: (p. 586): 76,77,78,79,80,85,90
6		Review problems worksheet	HW#3: p.584 MC/AC: 43,44,45,46,49,50,51,52,54,55,57,60
7		Review	
8		Unit Test	

Note: Homework is due on the day following the assignment, unless otherwise noted.

Objectives / Essential Learnings: (key terms in **bold**)

1. Define an **electric field**; explain how to measure it.
2. Describe how electric fields are represented by vectors and by **electric field lines**.
3. Describe how the direction of an electric field at a point is determined.
4. Relate the spacing of electric field lines to the strength of the field.
5. Describe how objects can be completely shielded from an electrical field.
6. Explain why a charged object in a electric field is considered to have **electric potential energy**.
7. Distinguish between **electric potential energy** and **electric potential**.
8. Define the electric potential difference in terms of **work done** moving a test charge.
9. Know units of potential; solve problems involving potential in uniform electric fields.
10. Describe how electrical energy can be stored.
11. Explain how **capacitors** store electric charge.
12. Solve problems pertaining to **capacitance**.
13. Describe the purpose of a Van de Graaff generator.

Elementary charge (one electron (e)) = $1.60 \times 10^{-19} \text{C}$
1 coulomb (C) = $6.25 \times 10^{18} \text{e}$

Coulomb's law Where K (the electrostatic constant) = $9.0 \times 10^9 \text{ N m}^2/\text{C}^2$

$$F = \frac{KQq}{r^2}$$

Magnitude of electric field (E)

$$E = \frac{F}{q} = \frac{KQ}{r^2}$$

Electric Potential Difference (volts)

$$\Delta V = \frac{\Delta PE}{q} = \frac{Fd}{q} = Ed$$

Capacitance

$$C = \frac{q}{\Delta V}$$