

## 9 Energy stored in Capacitors and Electric Fields; Dielectrics

### 9.1 Lecture Notes

- Charge goes up (conceptual example).
- Lets you apply higher voltages (so more charge).
- Lets you place the plates closer together (make  $d$  smaller).
- Increases the value of  $C$  because  $\kappa > 1$ .

### 9.2 Recitation

- Before the exam, we had a capacitance equation with a  $\kappa$ .
  - Suppose we disconnect from battery, so  $Q$  is constant
  - Now put an insulator inside capacitor.
    - \* Tada, there's your  $\kappa$
    - \* Insulator means electrons are stuck where they're at.
    - \*  $\kappa > 1$ , usually.
  - This causes an electric field inside, causes a polarization.
- We can express the energy in three different forms, depending on what we know about the system.
- Energy conservation is inapplicable to these problems.