

Today	Ch 20 1 <sup>st</sup> ½ DC Circuits	HW10redo HW 12
Lab	4 DC Circuits	
Wednesday	Ch 20 2 <sup>nd</sup> ½ DC Circuits	HW11redo HW 13

### 19.3.1 Energy Storage in a Capacitor

#### Chapter 20: Electric Circuits

##### Introduction:

#### 20.1 Electromotive force and Current

- Principle of circuitry.
  - Vocab and symbols.
- $\mathcal{E} \equiv DV_{supply}$ 
  - Batteries:
    - Symbol.
- Current
  - Fluid analogy:
  - Definition
    - Direction
    - + vs. – charge flow:
  - AC / DC:
    - DC
      - Ex.
    - AC:
      - Ex.

**Example 1** Say a portable CD player can play for 2.0 h before completely draining the batteries. If it draws a current of 25 mA, how much charge is flow through the player, from one battery terminal to the other? How many electrons?

#### 20.2 Ohm's Law

- Flashlight
  - Ohm's Law Equation
    - Resistance definition
    - Directions
  - Water analog visual:

**Example 2:** Say the filament of our light bulb has a resistance of  $580 \Omega$  and it is screwed into a ceiling light socket, with a voltage of 120V across the terminals. What is the current through the filament?

#### 20.3 Resistance and Resistivity

- $r = \text{Resistivity}$

**Example 3:** A cylindrical copper cable carries a current of 1200 A. There is a potential difference of  $1.6 \times 10^{-2} \text{V}$  between two points on the cable that are 0.24 m apart. What is the radius of the cable?

- Temperature Dependence of Resistivity

**HW 13**

2. A defibrillator is used during a heart attack to restore the heart to its normal beating pattern. A defibrillator passes 18 Amps of current through the torso of a person in 2.0 ms. (a) How much charge moves during this time? (b) How many electrons pass through the wires connected to the patient?
3. The filament of a light bulb has a resistance of  $580\Omega$ . A voltage of 120 V is connected across the filament. How much current is in the filament?
7. The resistance of a bagel toaster is  $14\ \Omega$ . To prepare a bagel, the toaster is operated for one minute from a 120-V outlet. How much energy is delivered to the toaster?
13. A cylindrical copper cable carries a current of 1200 A. There is a potential difference of  $1.6 \times 10^{-2}\text{V}$  between two points on the cable that are 0.24 m apart. What is the radius of the cable?