

PHYS 1444 – Section 003

Lecture #10

Monday, Oct. 3,
2005

Dr. **Jaehoon Yu**

- Electric Current
- Ohm's Law: Resistance and Resistor
- Resistivity
- Electric Power
- Power in Household Circuits

Today's homework is homework #6, due noon, next Tuesday!!



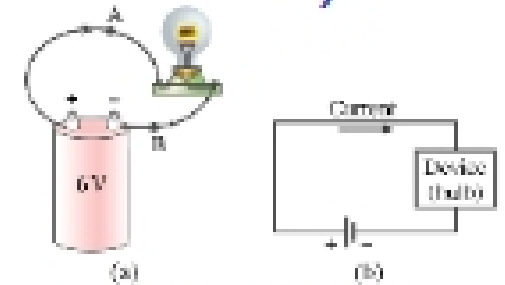
Announcements

- First term exam next Wednesday, Oct. 12
 - Time: 1 – 2:20 pm
 - Location: SH103
 - Coverage: CH. 21 – 25
 - Style: Mixture of multiple choice and numeric problems
 - There will be two more exams
 - Monday, Nov. 7, and Monday, Dec. 5
 - Two best of the three will be chosen for your final grading
- Reading Assignment
 - CH25 – 6



Electric Current

- When a circuit is powered by a battery (or a source of emf) the charge can flow through the circuit.



- Electric Current: Any flow of charge

- Current can flow whenever there is potential difference between the ends of a conductor (or when the two ends have opposite charges)
 - The current can flow even through the empty space
- Electric current in a wire can be defined as the net amount charge that passes through the wire's full cross section at any point per unit time (just like the flow of water through a conduit...)

- Average current is defined as: $\bar{I} = \Delta Q / \Delta t$

Unit of the current?

- The instantaneous current is: $I = dQ / dt$

C/s

1A=1C/s

- What kind of a quantity is the current? **Scalar**

In a single circuit, conservation of electric charge guarantees that the current at one point of the circuit is the same as any other points on the circuit.