HW #1   p 613   mc 1
                 C 18, 19
         p 614   Problems 3, 11, 49
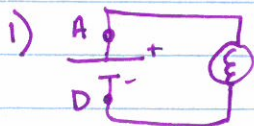   Online - ~~Stretchable~~
                 - Resistance + resistivity

p 613 - Multiple Choice   (8)

(1)

1)   what say about current?

The current is the same at
@l points in circuit

- Concept

18) Resistor connected to battery

A) How can you measure electric current in R?

· Take ammeter + connect in series
  to the R

(1)

B) How can you measure potential diff?

· Take voltmeter + connect in //
  to the R

c) How determine R?

· Connect (A) in series, the (V) in //
  Divide (V) by (A) gives R

19)   A) What does it mean if current is 4A?

   · There are 4C of electric charge passing
      through wire in each sec

   B) What does it mean if pot. diff is 6V?

   · one needs to do 6J of work
      to push 1C of charge through R

   C) What does it mean if R is 5Ω?

   · the ratio of potential diff to
      current is 5

p 614 — Problems

3) flashlight battery

   I = .50 A
   t = 3h = 10,800 s
   # electrons = ?

① $q = It = (.50A)(10,800s)$
   $= 5,400 C$

② $5400 C \left(\dfrac{1e}{1.60 \times 10^{-19}c} \right)$

   $3.38 \times 10^{22} e$

11) person touch 120 V line

a) I = ? dry hands
R = 100,000 Ω

$I_{dry} = V/R = \frac{120V}{100,000Ω} =$

$1.2 \times 10^{-3} A$

(1.2 mA)

b) I = ? Wet hands
R = 5000 Ω

$I_{wet} = V/R = \frac{120V}{5000Ω}$

.024 A   (24 mA)

c) If current exceeds 10 mA muscles won't release

· There's no danger w/ dry hands +
unsafe w/ wet hands

49) d = .10 mm   so r = .05×10⁻³m $R = \frac{\rho L}{A}$
l = ?
R = 25 Ω
ρ = 1.0 × 10⁻⁷ Ω m $L = \frac{R \cdot A}{\rho} = \frac{R \pi r^2}{\rho}$

$= \frac{(25Ω) \pi (.05 \times 10^{-3} m)^2}{1.0 \times 10^{-7} Ωm}$

$= 1.96 m$

— Online - Resistance + Resistivity

At same temp two wires made of pure copper have different R. The same voltage is applied at ends of each wire. The wires may differ in

- length   · cross-sectional area
- amount of current   ✗ resistivity