

News

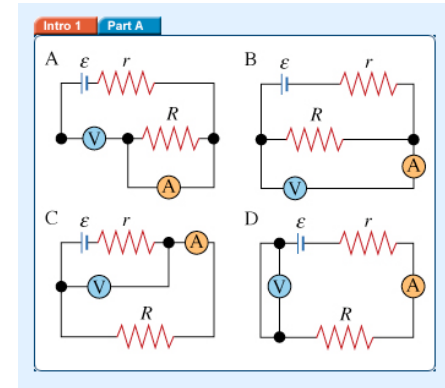
- Quiz #2: Monday, 3/14, 10AM
- Same procedure as for quiz 1
 - Review in class Fri, 3/11
 - Evening review, Fri, 3/11
 - 2 practice quizzes (+ practice problems)
 - Formula sheet
 - From Potential to Kirchoffs Rules, EF exp

Mar 7 2005

web.mit.edu/8.02x/www

News, II

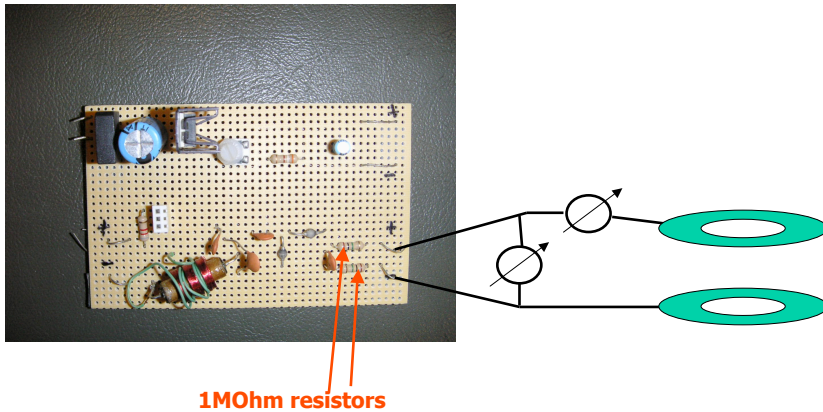
- This weeks MP:



Mar 7 2005

web.mit.edu/8.02x/www

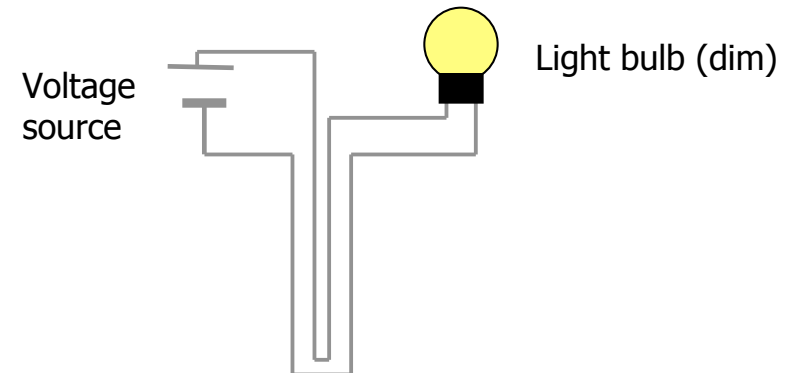
News, III



Mar 7 2005

web.mit.edu/8.02x/www

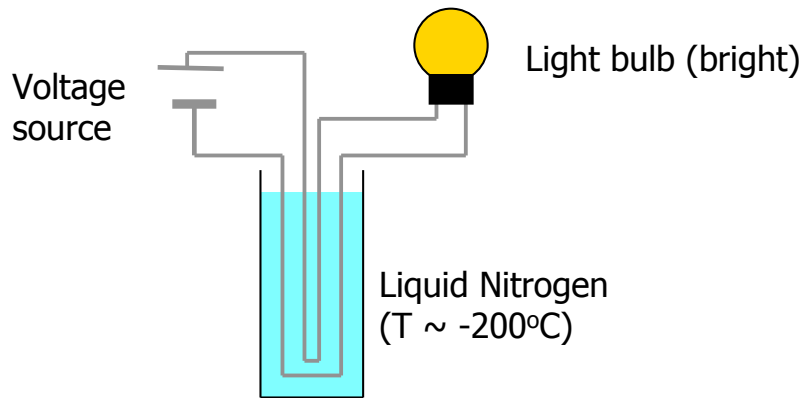
Demo



Mar 7 2005

web.mit.edu/8.02x/www

Demo

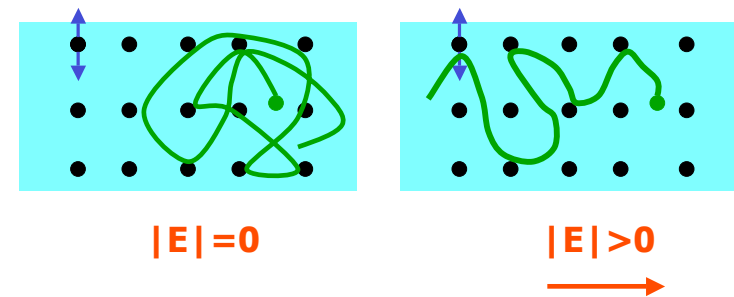


Wire cold \rightarrow less resistance \rightarrow more current \rightarrow bulb burns brighter

Mar 7 2005

web.mit.edu/8.02x/www

Microscopic View



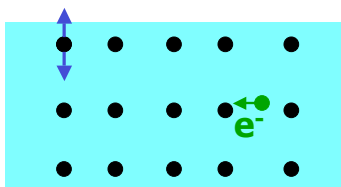
If $|E| > 0$: Electron accelerated between scatterings

On average: Electron moves in $-E$ direction

Mar 7 2005

web.mit.edu/8.02x/www

Microscopic View



Where does friction come from?

Metal: Electrons move through lattice of atoms

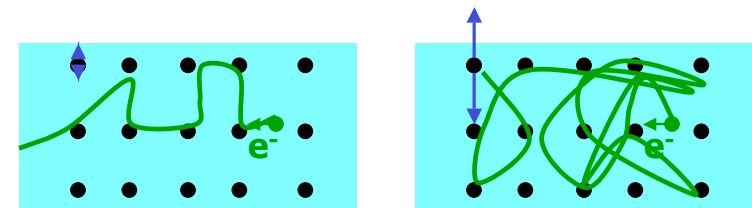
Lattice: Thermal vibrations, average position fixed

Electrons: Low mass! Bounce around...

Mar 7 2005

web.mit.edu/8.02x/www

Demo



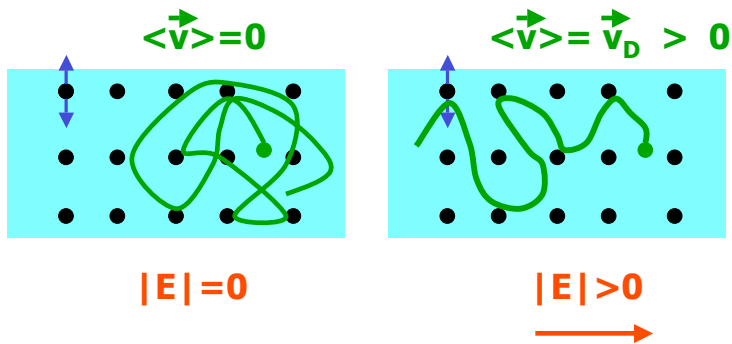
- T low
- Less vibration
- Electrons move through lattice easily

- T high
- Big vibration
- Electrons bounced around

Mar 7 2005

web.mit.edu/8.02x/www

Microscopic View

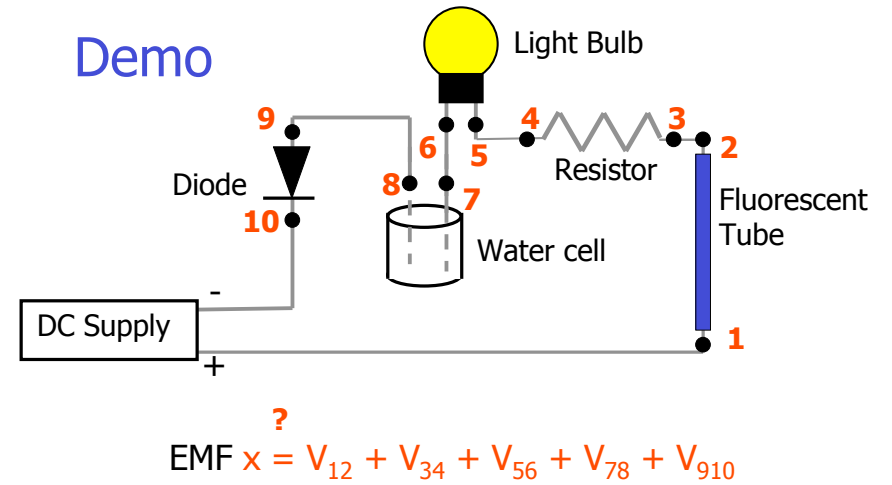


Interplay of acceleration + scattering:
Constant drift velocity v_D (proportional to $|E|$)

Mar 7 2005

web.mit.edu/8.02x/www

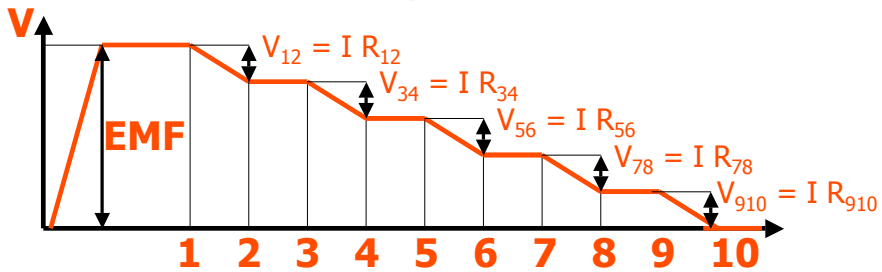
Demo



Mar 7 2005

web.mit.edu/8.02x/www

Loop Rule



In general, $\sum \text{EMF}_i = \sum \Delta V_j$ Loop Rule

Mar 7 2005

web.mit.edu/8.02x/www