

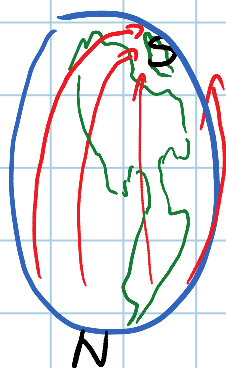
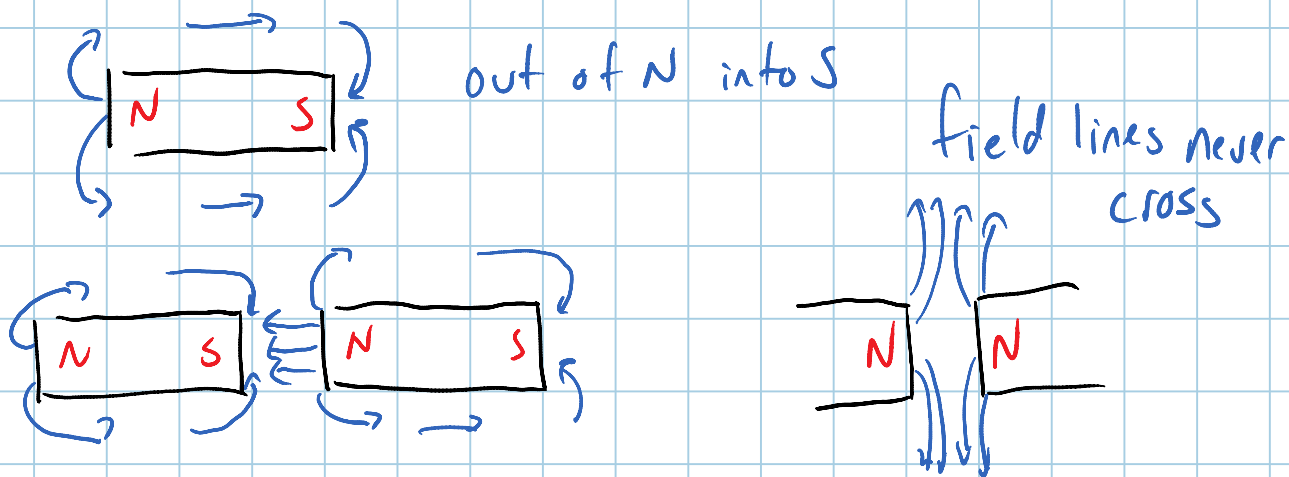
# Magnetic Fields

Friday, December 13, 2013  
10:16 AM

Magnetic Field is the region in space where magnetic effects can be detected

$\vec{B}$ , vector units are Tesla (T)

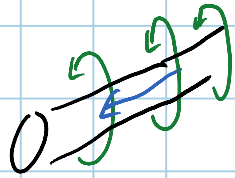
## Bar Magnet



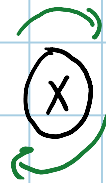
A compass points in the direction of the field line. Earth's North pole is really a south

Magnetic Flux: the density of the field lines

Wire: When current flows in a wire a magnetic field is produced. The direction of the  $\vec{B}$  field is determined by the Right Hand rule

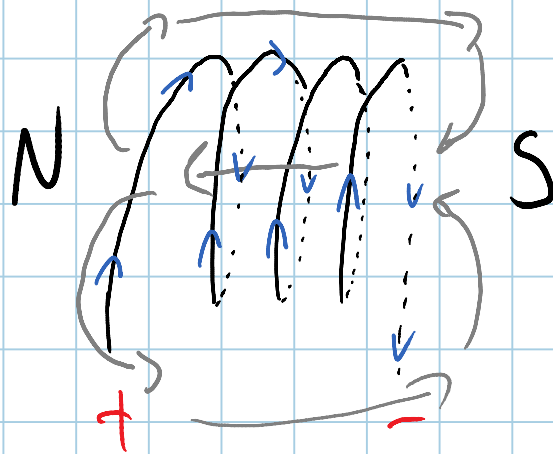
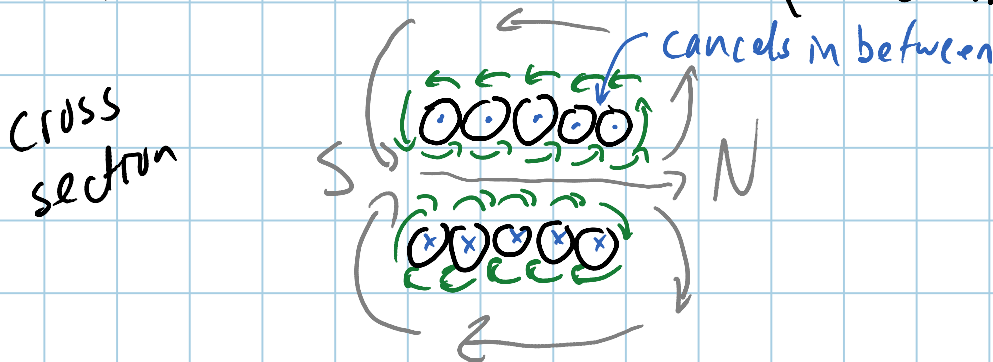


current is coming out of page



current into page

Solenoid: a coil of wire (electromagnet)



Magnetic Force: When 2 magnetic fields interact

they will produce a magnetic force

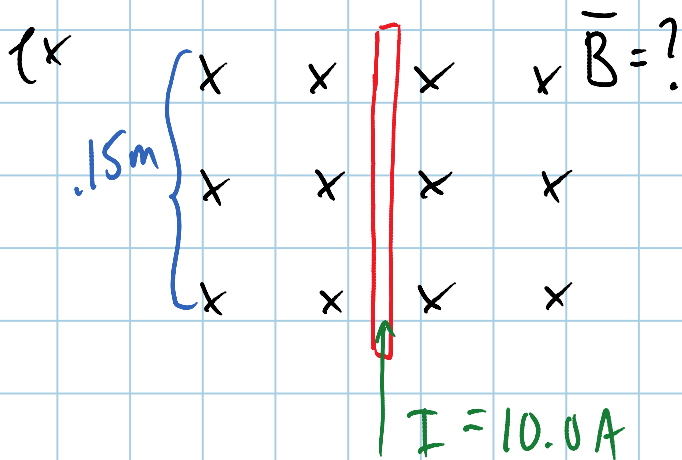
For a wire in a magnetic field

$$F_m = B \cdot I \cdot l$$

$\bar{B}$  - mag. field strength

$I$  - current in wire

$l$  - length of wire in field



If the wire experiences a

0.06 N force what is

$\bar{B} = ?$

$$F_m = B \cdot I \cdot l$$

$$.06 \text{ N} = B (10 \text{ A})(.15 \text{ m})$$

$$\bar{B} = .040 \text{ T}$$