

Refresh, Recollect & Reflect

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B-Fields

*** E & M ***

a Saint Ann's Study of

*** J & P. ***

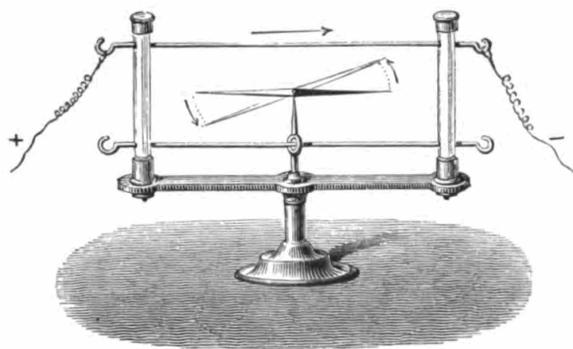
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Due Tuesday, March 22, 2016

Remember! All problems must always be solved fully with PICTURES, WORDS and COMPUTATION:

You may use whatever resources you wish: your text, your colleagues, the internet, etc.,

but be sure to vivid DIAGRAMS for all appropriate parts and CITE wherever knowledge has been acquired rather than derived.



a) According to Oersted's historic experimental finding (depicted above), two light, straight, long wires carrying currents going in parallel directions will do WHAT to each other?

b) Oersted's experimental finding is generally explained by a belief that moving charges create WHAT?

c) Draw a magnetic field line diagram for a long straight current:

- i. Head-On: As though the current is coming out of the whiteboard toward your eye.
 - ii. Side-View: As though the current is traveling in a straight line from one side of the whiteboard toward the other.
- d) Write down a clear and complete expression (EQUATION!) for the magnetic field as a function of charge, velocity and displacement from the charge.
- e) Write down a clear and complete expression (EQUATION!) for the magnetic field as a function current, length and displacement from the current.
- f) Write down a clear expression for the magnetic force as a function of current, length, and magnetic field.
- g) Write and illustrate a complete compare/contrast between the "Dot Product" and "Cross Product" for the multiplication of two vectors.
- h) Write and illustrate a complete compare/contrast between the behavior of electric field lines from charges and the behavior of magnetic field lines from charges.
- i) Put together all the above results in order to provide and illustrate a clear and complete EXPLANATION for Oersted's finding --

IN TERMS OF MAGNETIC FIELDS AND FORCES!