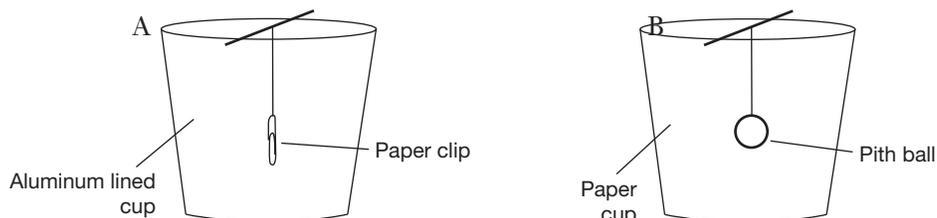


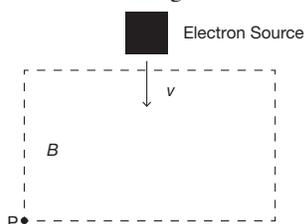
AP Physics 2 Review Questions

Integrating Content, Inquiry and Reasoning

1. A charged rod is brought near cups A and B. Then the charged rod is replaced with a bar magnet and brought near cups a and b. When the charged rod is used, the paper clip does not move, but the pith ball is attracted to the rod; when the magnet is used, the paper clip is attracted to the magnet but the pith ball does not move. Explain, in terms of the electric and magnetic fields and respective magnetic domains, the movement of the paper clip and the pith ball in each scenario.

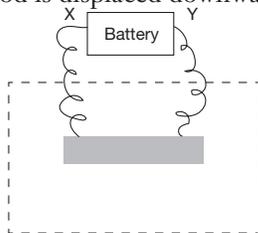


2. Electrons are emitted from an electron source with velocity, v , and enter a region of uniform magnetic field B that is perpendicular to the page. The electrons then leave the magnetic field at point P .



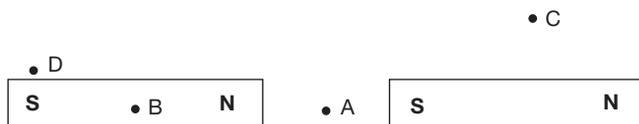
- a.* On the figure above, sketch the path of the electrons from when they enter the region of uniform magnetic field B to point P .
- b.* Indicate whether the magnetic field is directed into or out of the page. Explain your reasoning.
- c.* If the electron's velocity is 5×10^6 m/s, what is the magnetic force on the electron due to the magnetic field B if the field has a magnitude of 2 T?

3. A conducting rod hangs from two conducting springs with their upper ends fixed at points X and Y. The rod is in a uniform magnetic field, B , that is directed out of the page. A battery is connected between points X and Y as shown, which results in a current, I , in the rod. The rod is displaced downward and eventually comes to equilibrium.



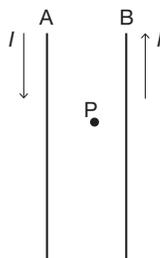
Which point, X or Y, is connected to the positive terminal of the battery? Justify your answer.

4. Consider the figure below:



Rank, in order of increasing magnitude, the strength of the magnetic field at points A–D.

5. Two long current-carrying wires are placed parallel to each other.



a. What is the direction of the magnetic field at point P produced by wire A? By wire B?

b. Are the wires attracted to or repelled from each other? Explain your reasoning.