

As soon as current flows through the coil you will observe that the iron powder gets adjusted in the direction of the magnetic field produced by the solenoid.

The actual field is 3 dimensional in the space around the bar magnet as well as the solenoid. The acrylic platform takes a planer section of these fields. As the patterns appears similar, we can say "a solenoid functions like a bar magnet."



FIELD DUE TO A SOLENOID

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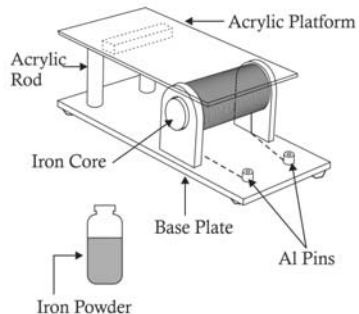
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FIELD DUE TO A SOLENOID

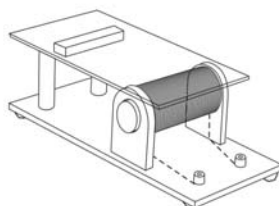
Compare the magnetic field produced by a solenoid with that of a bar magnet

Assembly:

Consists of a coil made up of insulated copper wire of 26G wound (250 turns) on a hollow plastic tube. This tube is fixed between two stoppers. The whole coil arrangement is fixed on a 4mm acrylic base plate as shown in the diagram. The ends of the coil are connected to the two aluminium pins. These pins are used for passing current through the coil. An iron core of dia 18 mm and of length 75 mm is fixed inside the coil. Using two acrylic rods, a 2 mm acrylic platform is fixed above the coil as shown in the diagram. At the other end of the coil a plastic (blue) magnet holder is fixed below the platform. A two inch bar magnet is fixed in this magnet holder. A small quantity of iron powder is part of the kit.

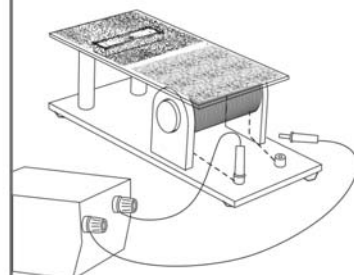
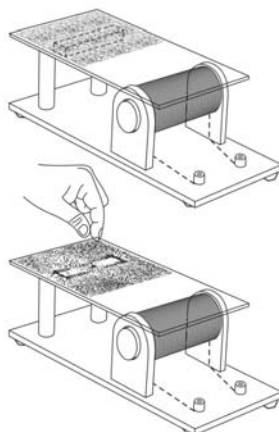


To do and notice :



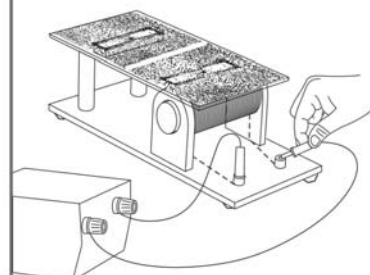
Step 1:

Sprinkle small quantity of iron powder on the platform above the bar magnet. Tap it gently. you will observe that the iron powder gets adjusted along the magnetic field lines of the bar magnet.



Step 2:

Now sprinkle iron powder on the platform above and around the coil.



Step 3:

Using DC power supply (12V 3amp) pass the current through the coil (as shown in the diagram) momentarily.