Magnaprobe Lab

0. Pick up a magnaprobe from the paper from one of the outlines. These are actually very expensive little things, so be very gentle with them. Try to avoid sticking them to anything. The red end is the north pole end, and so it is like the tip of an arrow; whichever way the red end points, so points the magnetic field.

A. The Fixed Magnets.

1. Move the probe around the rectangular fixed magnet and let the magnaprobe trace out the magnetic field. Which end of this magnet is the North pole end?
2. The rock looking thing is a piece of lodestone – magnetic ore from the earth. Map out its magnetic field. Where is its north pole?
3. Carefully figure out on the hard drive magnets taped to the counter where the N and S poles are. Inside the hard drive they would face each other.
4. Check out the see-through computer hard drive.

B. The mysterious Levitation Spinny Magnet.

Solve the mystery that is the levitation spinny magnet using your magnaprobe. Where are magnets hidden in the base, and spinny part? What is their polarity?

C. Electric motors

Check out the electric motors. Where are the poles on the fixed magnets? Look at the motor for the hard drive. Find the poles on the rotor (The thing that spins attached to the platters)

D. The hand crank generator.

Turn this generator gently – it is very expensive to replace. Try turning the generator with nothing attached, and then connect it to the bulb. Notice how the resistance changes. Now try connecting the clips together in a dead short. Notice how it is really hard. The idea here is that the work you are doing turning the crank turns into electrical power. The more current that flows, the more work you must do. Try the hand crank flashlight. Squeezing the handle makes a generator spin inside the body of the flashlight. How does the light stay lit when you are not actually squeezing the handle?

E. A current carrying straight wire.

Turn the power supply on, and check to see that about 4 A of current is flowing. Find the large square made of many windings. Pick the vertical side nearest you and treat it as a long straight wire. Use the wire right hand rule to predict which way the magnetic field wraps around the wire. (Thumb – I, fingers wrap as B) Now use the magnaprobe to confirm this.

F. Flat solenoid.

Now treat the large square with many windings as a flat magnet. Use the right hand rule for solenoids to determine where the north pole is on this magnet. (fingers wrap as I, thumb is the N pole) Use the magnaprobe to check this. Figure out which way the field is in the area inside the coil in general.

G. The long long solenoid.

Turn the power supply on and check to see that a current of about 4 A is flowing. The current is coming out of the red terminal of the power supply, and going into the black terminal. Use your right hand rule for solenoids to determine the north pole for this solenoid. (fingers wrap as I, thumb is the N pole) Generally check out the direction of the magnetic field around and inside the solenoid.

Put your magnaprobe back on the paper where you found it.

H. BusyTown

By reaching under the box, find the little magnets stuck the underside of the street. Use this to drive your little car around the streets of BusyTown. Remember to stop at the intersections – they are all four way stops, and also stay on the right side of the road – because this isn't Britain, is it?? See if you can find your way to the gas station, the antique shop, and the shoe store. But seriously, you can steer the car, so how must the poles of the magnets be laid out above and below the cardboard?