Magnetic Fields

Aim: To observe magnetic field lines

Equipment:

- Sheet of white paper
- Pair of bar magnets
- Small compass
- Iron filings
- Pencil

Safety Information

Iron filings – rinse hands under cold water to remove from skin. Do not rub your eyes.

Figure 1	
Figure 2	
Figure 3	

Method:

Step 1: Set up the bar magnet as shown in figure 1 on the sheet of white paper.

Step 2: Gently scatter iron filings around the bar magnet. Allow them to settle.

Step 3: Draw the pattern of the magnetic field lines on your results sheet.

Step 4: Using the compass, position it at different points around the bar magnet, each time drawing an arrow on your diagram to show which way the compass is pointing.

Step 5: Repeat steps 1 to 4 for the bar magnet set-ups shown in figures 2 and 3.

Results:

1	
2	
3	

Questions:

1. Do the magnetic field lines point from north to south, or from south to north around a bar magnet (figure 1)?
2. Where is the magnetic field strength strongest around a bar magnet (figure 1)?
3. Where is the magnetic field strength weakest around a bar magnet (figure 1)?
4. Describe the magnetic field line pattern between two opposite poles of bar magnets (figure 2). What will the magnets do?
5. Describe the magnetic field line pattern between two same poles of bar magnets (figure 3). What will the magnets do?

Answers:

1. Magnetic field lines go from the north pole into the south pole.
2. The magnetic field strength is strongest at the poles.
3. The magnetic field strength is weaker the farther it is from the magnet.
4. The magnetic field lines go straight from the north pole of one magnet into the south pole of the other magnet. The magnetic field strength is strongest between the poles. The bar magnets will attract.
5. The magnetic field lines create a diamond between the poles. The magnetic field strength is weakest between the poles. The bar magnets will repel.