

## Electricity and magnetism

# Printing magnetic fields

### A convenient way to plot magnetic fields

#### You will need....

- ✓ iron filings
- ✓ bar magnets
- ✓ a photocopier

#### Background:

Iron filings line up along the lines of force of a magnetic field.

#### Follow these steps:

1. Sprinkle iron filings evenly on the glass of a photocopier. Place magnets gently on the glass. Tap the edge of the glass a few times until the filings form a distinct pattern.
2. Close the cover. Photocopy.

#### So what happened?

The iron filings in the space near the magnet (the magnetic field) become magnetised particularly those that are near their poles and attract one another. As a result they tend to form lines.

If the iron filings are not evenly spread at the start then the magnetic field may appear asymmetric.

#### What next?

1. Add small plotting compasses and photocopy the results.
2. Instead of placing the magnets directly on the photocopier glass, raise them one or two centimetres by means of small blocks of wood or plastic – preferably of the same horizontal dimensions as the magnets.
3. Investigate the effect of placing some metallic objects on the glass before sprinkling on the iron filings; use ferro-magnetic and non-magnetic objects, e.g. a steel nail, a nickel coin, a copper coin, a paper clip, a key etc.

