

# An Introduction to Electromagnetic Induction

## LEAD-IN

① Working in groups of three or four, state whether the following sentences are *true* or *false*, and correct the false ones.

- 1 If you move a magnet towards a compass and then away from it, the needle deflects in one direction and then in the other. T F
- 2 Wearing a metal bracelet near a strong magnetic field can be hazardous. T F
- 3 Magnetic fields have many uses, but you can't cook food with them. T F

② Match the terms (1-9) to their corresponding definitions (a-i).

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|---|--|
| <input type="checkbox"/> 1 Electric current | a The property of the space around a magnet or current-carrying medium. When any other magnets or compass needles enter it, they experience a force.   |
| <input type="checkbox"/> 2 Magnetic field   | b An instrument for indicating a reference direction relative to Earth.  |
| <input type="checkbox"/> 3 Compass          | c A closed path of circuit in which a current can circulate.   |
| <input type="checkbox"/> 4 Electric field   | d Electromotive force.   |
| <input type="checkbox"/> 5 Electric loop    | e An instrument designed to measure the magnitude of electric current.   |
| <input type="checkbox"/> 6 Galvanometer     | f At a given point, their tangent indicates the direction of the vector field. The number of them per unit area on a perpendicular surface is proportional to the magnitude of the field in that region. |
| <input type="checkbox"/> 7 <i>emf</i>       | g The net transfer of unit charge per unit time.   |
| <input type="checkbox"/> 8 Ammeter          | h An instrument used to measure a small electric current. It works by detecting a mechanical movement derived from electromagnetic forces produced by the current.                                       |
| <input type="checkbox"/> 9 Field lines      | i The property of the space around a charged object. Any other charged objects entering it will experience a force.  |

### WORD ORIGIN

The word **electric** originates from "*electron*", the Greek word for "amber". The origin of the word **magnetic** is to be found in the ancient Greek city of Magnesia, where magnetite was first discovered. The ancient Greeks observed electrical and magnetic phenomena in around 600 B.C., while some Chinese documents indicate that magnetism was observed in 2000 B.C.

