

Electricity and Magnetism

Section 1: Vocabulary

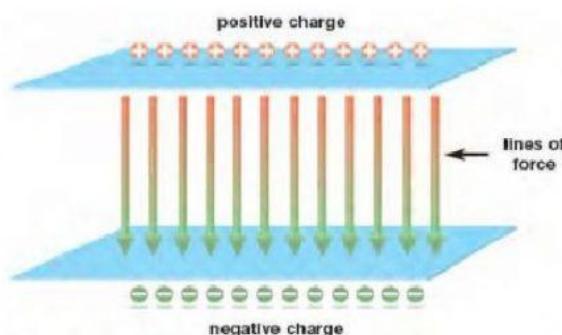


Figure 1: Electrostatic effects

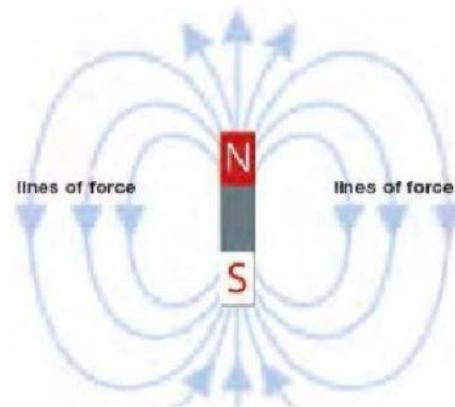


Figure 2: Ionizing a polythene rod

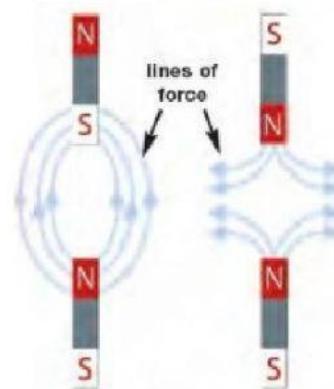


Figure 3: Magnetism

A Read the text and look at the pictures.

One of the most important forces in nature is **electricity**. Electrical effects are caused by **electric charges**. Electric charges can be **positive** or **negative**. If positive and negative charges are brought close to each other, there is an **electrostatic effect** between the two and an **electric field** is created (see Figure 1). An electric charge stays in one place, while an electric **current** flows along a conductor such as a wire.

Atoms are normally **neutral**, with equal numbers of protons and electrons. However, an atom can **gain** or **lose** electrons. An atom that does not have an equal number of protons and electrons is called an **ion**. If you rub a polythene rod, it will gain electrons and become **ionized** or **charged** (see Figure 2). If a charged or

ionized object is brought close to another object, it can **induce** a charge in the second object. This process is called **induction**. For example, a charged polythene rod will pick up the edge of a piece of paper. The negative charge of the rod will force away or **repel** the electrons on the edge of the paper and so the edge will become positively charged. Opposite or **unlike** charges **attract**, so the rod picks up the edge of the paper.

Another important force in nature is **magnetism** (see Figure 3). Some objects are **magnetic** and will pick up iron and some other metals. Magnets have two ends, a **north pole** and a **south pole**. **Like** poles repel, for example north to north, whereas **unlike** poles attract, for example north to south.

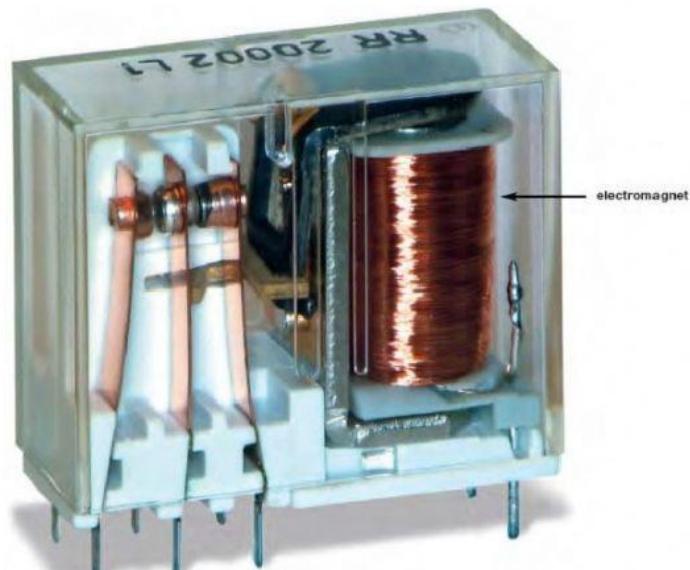
B Complete the text. Use the correct words in the box.

| | | | | | | | | | | | |
|---------|-----|----------|-----------|------------|-------|-------------|----------|--------|---|--------|---|
| attract | - | charged | - | current | - | electricity | - | fields | - | induce | - |
| magnet | - | magnetic | magnetism | - | metal | - | negative | - | | | |
| north- | off | - | pole- | positively | - | repel | | | | | |

There are great similarities between electricity and _____

- Both create force _____ around them.
- Both have two 'forces'. With electricity, it is positive and _____ charging. With magnetism, it is a north and a south _____
- In both cases, like forces _____ whereas unlike forces _____. So a negatively _____ polythene rod will attract _____ charged paper, while the north pole of a _____ will repel the _____ pole of a second magnet.
- Both can _____ a force in a nearby object.

There is also a strong relationship between _____ and magnetism. If you pass an electric _____ through a wire, you create a _____ field with a north pole and a south pole. This device is called an electromagnet. The magnetism can be switched on and _____ with the current. Electromagnets are used in switches and bells, and in factories to pick up heavy _____ objects and move them to another location.



an electrical switch containing an electromagnet