

4 Magnetism and static – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
magnets	磁体	_____	_____	_____
static electricity	静电	_____	_____	_____
magnet	磁体	_____	_____	_____
poles	磁极	_____	_____	_____
repel	排斥	_____	_____	_____
attract	吸引	_____	_____	_____
magnetic materials	磁性材料	_____	_____	_____
magnetic field	磁场	_____	_____	_____
field lines	磁场线	_____	_____	_____
charges	电荷	_____	_____	_____
electrons	电子	_____	_____	_____
conductor	导体	_____	_____	_____
insulator	绝缘体	_____	_____	_____

Recall

You have played with **magnets** 磁体 and felt the spark of **static electricity** 静电. The IGCSE course explains both with simple rules.

- Every magnet has a **north** and a **south** pole.
- Electric charge comes in two kinds: positive and negative.

Nothing here is hard — it just adds the rules.

New ideas

Read these first, then do the Practice.

■ 1 Magnetic poles

Every **magnet** 磁体 has two **poles** 磁极: north (N) and south (S). The rule:

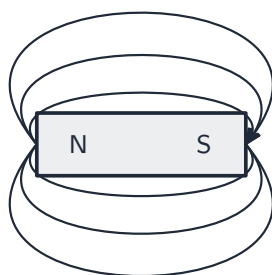
- **same** poles (N–N or S–S) **repel** 排斥 (push apart).
- **different** poles (N–S) **attract** 吸引 (pull together).

A magnet attracts **magnetic materials** 磁性材料 — iron, steel, cobalt, nickel — but not copper, plastic or wood.



■ 2 Magnetic fields

A **magnetic field** 磁场 is a region where a pole feels a force. We draw **field lines** 磁场线 that come **out of N** and go **into S**. Closer lines = stronger field.



■ 3 Static electricity

There are two **charges** 电荷: positive and negative (same rule — like repel, unlike attract). Rubbing two materials moves tiny negative **electrons** 电子 from one to the other:

- the material that **gains** electrons becomes **negative**.
- the material that **loses** electrons becomes **positive**.

A **conductor** 导体 (metal) lets charge flow; an **insulator** 绝缘体 (plastic) does not.

Watch out: field lines always run **out of N and into S** — never the other way. Rubbing only ever moves **electrons** (negative): the material that *gains* electrons becomes negative, the one that *loses* them becomes positive.

Practice

Try these in order.

4.1 State the rule for two magnetic poles. [2]

4.2 Name two magnetic materials. [1]

4.3 Which way do magnetic field lines point — out of which pole, into which? [1]

4.4 A plastic rod is rubbed with a cloth and becomes negative. Explain what happened to the electrons. [2]

4.5 State the difference between a conductor and an insulator. [2]

4.6 Challenge. Two plastic rods are each rubbed with a cloth and both become negatively charged. State and explain what happens when they are brought close together.[2]