

UNIT 3

MAGNETS

SCIENCE OBJECTIVES

By the end of this unit, students will be able to:

- State that magnets can attract some metal materials.
- State that a magnet has a north pole and a south pole.
- Describe how two magnets can attract and repel each other.
- Use a compass to find north.

LANGUAGE OBJECTIVES

In this unit, students will have opportunities to use:

- Words relating to the features of magnets.
- The sentence structures:
 - “The magnet (can/cannot) attract (iron/plastic).” to describe exploration with a magnet.
 - “These poles (repel/attract).” to describe the interaction of different poles.

UNIT OVERVIEW

Magnets appear to have “magic” properties. They will fascinate young learners. Although some rocks are natural magnets, most modern magnets are man-made, and shaped for particular purposes (e.g. compass needles). Magnets can attract some materials without contact. We call this an “action-at-a-distance” force. Not all materials are attracted to a magnet — not even all metals. Repulsion happens only when the same poles of two magnets approach each other.

The unit cover page shows some everyday experiences involving magnetism. Students will probably refer to a magnet as “sticking” to a surface, rather like sticky tape or glue. The actual mechanism of attraction is very complex and involves understanding atoms, and so cannot form part of this stage of learning. Lesson 1 allows students to explore the “sticking” features of magnets, particularly to different materials. Lesson 2 introduces the more formal ideas of attraction and repulsion. In Lesson 3, students make a simple compass needle using a magnet and a pin.

第三单元 磁铁

科学目标

通过本单元的学习，学生将能够：

- 说出磁铁能吸引某些金属材料。
- 说出磁铁有南极和北极。
- 描述两块磁铁是如何相互吸引或者相互排斥的。
- 使用指南针寻找北方。

语言目标

在本单元中，学生将有机会使用：

- 与磁铁的特征相关的词汇。
- 句型：
“The magnet (can/cannot) attract (iron/plastic).” 来描述对磁铁的探究。
“These poles (repel/attract).” 来描述不同磁极的相互作用。

单元概述

磁铁似乎拥有“魔法般的”特性，这点很容易吸引少年儿童。尽管有些岩石是天然的磁铁，但现代的磁铁大多数都是人造的，为特定的用途塑造成不同的形状（比如，指南针的指针）。磁铁不接触物体就能够吸引某些材料，我们称之为“非接触力”。并不是所有的材料，甚至也不是所有的金属都可以被磁铁吸引。只有在两块磁铁的同名磁极相互靠近的时候才会发生排斥。

篇章页呈现了一些和磁有关的生活体验。学生可能认为磁铁像胶带或者胶水一样“粘到”某个表面，但磁铁吸力的真正原理相当复杂，涉及原子的相关知识，所以本阶段的学习不包含这一点。在第一课中，学生将探究磁铁的“粘贴”的性质，尤其是对不同材料的吸引。第二课将正式介绍吸引和排斥的概念。在第三课中，学生将用磁铁和针制作简单的指南针。