Book 3A, Unit 3 *Magnets*

Lesson 3 *Which Way Is North?*

Science Objectives

By the end of this lesson, students will be able to:
- State that a compass can help them find north.
- Make a compass needle using a magnet and a pin.

Language Objectives

In this lesson, students will have the opportunity to use:
- Words relating to the features of magnets: **compass, needle, north, south**
- The sentence structure: "These poles (repel/attract)." to describe the interaction of different poles.
- Additional language: **east**, **west**

Materials

Review Activity	**Stimulus Activity**
- x2 red "N" signs - x2 blue "S" signs	- an image of Earth, seen from space, with the North and South Poles clearly visible - an image of a polar bear, with the speech bubble/caption "I live in the North Pole." - an image of a penguin, with the speech bubble/caption "I live in the South Pole." - a globe (an inflatable one, if possible, so it is easy to pass around)
Activity 1 - an image of a compass *per group:* - a compass - a "NORTH" sign - a "SOUTH" sign	**Activity 2** *per pair:* - a small magnet - a needle or pin - a small square of sponge or foam - a small container of water

Review Activity

Open your books

Review what happens when magnets meet
- Draw a magnet on the board. Point to the poles and ask: What are they? (They are) poles.
- Write *N* on one pole. Point to it and say: This is the… Encourage students to complete your sentence with North pole. Write *north pole* on the board.

- Repeat the previous step for “south pole”.
- Hold up two red “N” signs and say: Two north poles… Encourage students to complete your sentence with Repel. Write *repel* on the board.
- Repeat the previous step for two south poles (repel) and a north and a south pole (attract), using the “N” and “S” signs.

Stimulus Activity

Books closed!

- Display an image of Earth, as seen from space, on the board.
- Display an image of a polar bear with a speech bubble reading “I live in the north pole.” Ask: Where is the north pole? Encourage students to share their ideas, then nominate one student to come to the front and draw an arrow from the polar bear to the north pole. Label it *north pole*.
- Repeat the previous step with an image of a penguin saying “I live in the south pole.”
- If possible, show students a globe and pass it around the classroom so they can each find the north and south poles.

Open your books

- Open the SB at p36 and draw students’ attention to the picture. Ask: Where are Mary and Tom? (Mary and Tom are) on an island. What do they want to find? (They want to find) treasure. Where is the treasure? (The treasure is) 12 paces north. How can you find north? Encourage students to share their ideas.
- Draw a simple compass on the board, labelled *North*, *South*, *East* and *West*. Ask: What is it? (It is) a compass. Write *compass* on the board.

- Say: Today, we are going to find out which way is north.

Key Words

- Open the SB at p36 and draw students’ attention to the key words.
- Write the key words on the board: **compass**, **needle**, **north**, **south**
- Read or play the recording of the key words and ask students to repeat.
- Use pictures or gestures to help students understand their meanings.

Activity 1

Books closed!

- Display an image of a compass. Explain that the needle on a compass is a small magnet, and that the magnet always points north. To find north, you must rotate the base of the compass so that the letter “N” lines up with the north-pointing tip of the needle.
- Put students into groups. Give each group a compass, a “NORTH” sign and a “SOUTH” sign. Ask: Which way is north? Which way is south? Give students time to find north using their compass and place the signs on the wall. As they work, walk around the classroom to make sure that they are using the compass correctly.
- Check answers as a class using your own compass.

Teacher Tips

Remind students that to give an accurate reading, the compass must be kept away from other magnets and magnetic objects.

Extension 1

Tell students to use their compasses to find east and west.

Extension 2

Ask students what other ways we can find north. They may mentioned the sun and the stars: at midday, the sun is positioned exactly south (if you're standing in the northern hemisphere), so your shadow points north; at night, you can follow the "pointer" stars of the Big Dipper to locate the North Star.

Teacher Tips

If you are using a compass with Chinese characters on the face, ask students the same questions and allow them to answer in Chinese. Then explain that 北 is north and 南 is south.

Activity 2

Books closed!

- Put students into pairs. Give each pair the materials they need to make a compass needle.
- Demonstrate each step of the activity for students to follow:
  1) Magnetize the needle by repeatedly stroking it with the north pole of the magnet, using a sweeping motion from left to right (around five strokes should be sufficient). Explain that the right end of the needle will point now point south.
  2) Move the magnet away from the needle.
  3) Place the needle on the piece of sponge.
  4) Place the sponge on the water and wait for it to settle.
- Ask: Which way is north? Which way is south? Encourage students to point in the correct direction.

Teacher Tips

Remind students to be very careful when handling the needles. They should only hold the needles at the blunt end and hold it away from other people.

Now I Know …

- Ask: What can you use to find north? (I/We can use) a compass (to find north).
- Read and/or listen to the recording and ask students to repeat: *I can use a compass to find north.*

Find Out More!

Open your books

- Open the SB at p38 and read the statement and question: The earth has a North Pole and a South Pole. Is the earth a big magnet?
- Put students into groups to find out what causes the earth's magnetic effect (the movement of molten material deep below the surface). More advanced students may also discover that the North Pole, despite its name, actually has a magnetic south pole, which is why it attracts the north poles of compass needles — north and south attract, so when a compass points "north", it is actually being attracted by a magnetic south pole.