



The Learning Progression Frameworks describe significant signposts in reading and writing as students develop and apply their literacy knowledge and skills with increasing expertise from school entry to the end of year 10. This teacher support material describes the opportunities in “The invisible Force” for students to develop the behaviours expected of students reading at Purple.

## Overview

“The Invisible Force” describes some of the characteristics of magnets and how these characteristics were first discovered and used. There are several other pieces on the topic of magnetism in this journal: a report that describes some ways that people use magnets today, a series of science experiments and activities, and a humorous story.

“The Invisible Force” requires students to “confidently use a range of processing and comprehension strategies to make meaning from and think critically about” text (*The Literacy Learning Progressions*, page 14).

Note that the science content in this article is presented in terms accessible to level 2 students. You can find further information about metals and magnetism in *Building Science Concepts Book 32: Introducing Metals: The Properties and Uses of Common Metals* (Levels 1–2).

There is a PDF of this text and an audio version as an MP3 file at [www.juniorjournal.tki.org.nz](http://www.juniorjournal.tki.org.nz)

## Related texts

Non-fiction texts about the physical world and technology: “Power from the Sun”, “Solar Power in Tokelau” (JJ 57), “Amazing Magnets” (in this journal)

Experiments or science-based activities: *Will They Float?* (RTR shared); “Fingerprints” (JJ 54); “Investigating Magnets”, “Let’s Race” (in this journal)

Texts that involve the use of compass points: “Buried Treasure” (JJ 53)

## Text characteristics

“The Invisible Force” includes the following features that help students develop the reading behaviours expected at Purple and build their knowledge of the features of non-fiction .

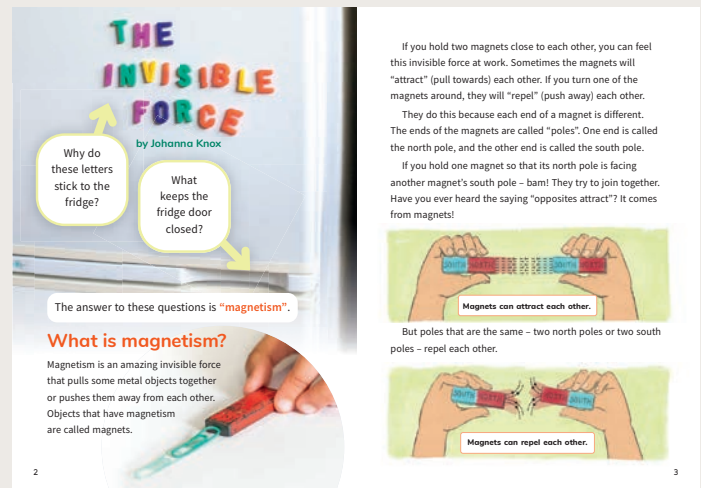
A mix of explicit and implicit content, including information that may be new, requiring students to make connections to their prior knowledge to track and visualise information and identify main points

The structure of the text as a report with an introduction, a series of main points, and a conclusion

Visual language features, including headings, photographs with captions, diagrams, and arrows to show direction

Information organised in paragraphs and the use of a variety of sentence structures, requiring students to attend to punctuation (including parentheses, dashes, and inverted commas) and linking words and phrases to clarify connections between ideas

Some words and phrases that may be unfamiliar, including topic vocabulary (for example, “invisible force”, “magnetism”, “metal”, “objects”, “attract”, “repel”, “poles”, “opposites”, “Thousands”, “lodestone”, “discovered”, “journeys”, “travellers”, “compasses”, “magnetic”, “needle”, “scientist”, “electricity”, “factories”, “microscope”) and some proper nouns, requiring students to use their processing systems



Language features typical of non-fiction:

- precise descriptive language, including noun phrases and definitions (often in parentheses)
- indicators of time (such as, “first”, “Thousands of years ago”, “today”, “These days”) and differences in verb tense (for example, “discovered”, “found”, “knew” / “are”, “can”, “have”) to distinguish between references to the past and the present
- various forms of the word “magnet” (“magnets”, “magnetic”, “magnetism” )
- familiar words (“face”, “poles”) used with less familiar meanings

## Cross-curriculum links

### English (Reading)

Level 2 – Processes and strategies: Selects and reads texts for enjoyment and personal fulfilment.

Level 2 – Structure: Understands that the order and organisation of words, sentences, paragraphs, and images contribute to text meaning.

### Science (Physical World)

Levels 1 and 2 – Physical inquiry and physics concepts: Explore everyday examples of physical phenomena.

### Technology (Nature of technology)

Level 2 – Characteristics of technology: Understand that technology both reflects and changes society and the environment and increases people's capability.



The New Zealand Curriculum

## Suggested reading purposes

*What can the students expect to find out or think about as a result of reading this text?*

- To find out about magnets and magnetism
- To think about why the author calls magnetism an “invisible force”

## Possible learning goals

*What opportunities does this text provide for students to learn more about how to “read, respond to, and think critically” about texts?*

The goals listed below link to the descriptions of reading behaviours in *The Literacy Learning Progressions* and the *Learning Progression Frameworks*. **Select from and adapt** them according to your students' strengths, needs, and experiences – their culture, language, and identity (*The Literacy Learning Progressions*, page 7).

This text provides opportunities for students, over several readings, to:

- use text and visual language features to identify and track information (**summarise**)
- **ask questions** and look for or think about possible answers
- **make connections** between information in the article and their prior knowledge to **make inferences** and **visualise**
- **monitor** their reading and, when something is unclear, take action to solve the problem, for example, by checking further sources of information, rereading, and/or reading on.



Sounds and Words



The Literacy Learning Progressions

## Introducing the article

Use your knowledge of your students to ensure that your introduction builds or activates their prior knowledge and provides appropriate support for a successful first reading. A short video on the importance of introducing the text is available at <https://vimeo.com/142446572>

Several options are provided below for you to **select from and adapt**.

- A few days before introducing this text, put out some magnets and a selection of metal and non-metal objects for the students to explore. Encourage them to record and display their discoveries on sticky notes. Introduce the terms “attract” and “repel” as you discuss their discoveries.

For English language learners, you could talk through the article to introduce key vocabulary (in English and in their first language if possible) and provide support with text features that may be unfamiliar. You can find further information about features of texts that may need support at [ELLP](#).

- Before giving the journals to the students, read the title and then ask them the questions on page 2 (with the answer concealed). (Alternatively, the day before, you might ask the students to talk about the questions with their families at home.) Discuss the students' ideas, then give out the journals so they can see the answer and the explanation of magnetism on page 2. Draw attention to the use of inverted commas for the word “magnetism” to show that it's important. Encourage the students to share what they know about magnets and magnetism. If necessary, clarify what “metal” is.

- Expect the students to recognise from the layout that this is a non-fiction text. Prompt them to make connections between the title, the photographs, and their previous exploration of magnets to predict what the “invisible force” might be. You may need to clarify the meaning of “force”, relating it to strength or power or pushing and pulling.
- Browse through the article together, prompting the students to use the headings, diagrams, and photographs to predict what they are likely to find out. Record any questions that the students have.
- Provide support for vocabulary by writing some key topic words (for example, “attract”, “repel”, “north pole”, “south pole”, “opposites”, “lodestone”, “compass”) on a chart. Record the students' initial ideas or questions about what the words mean and their connection to magnets. Leave room to add further information after reading. Tell the students to look out for the use of inverted commas to help them notice some of these important words.
- Set a reading purpose together and share the learning goal(s). Give the students sticky notes to mark questions or ideas that arise as they read and to note anything they want to come back to.

## Reading the article

For the first reading, encourage the students to read the article by themselves, intervening only if it's clear a student needs help. Much of the processing that they do at this level is "inside their heads" and may not be obvious until the discussion afterwards. There will be many opportunities to provide support with word solving and comprehension on subsequent readings.

### Student behaviours

*Examples of the sorts of behaviours (often overlapping and developed over several readings) that will help students achieve their learning goal(s).*

#### The students use text and visual language features to identify and track information.

- They use the headings to clarify what each section is about.
- They notice the use of inverted commas to indicate key topic words and the use of parentheses and phrases such as "Magnetism is ..." or "are called ..." to indicate definitions.
- They use the labelled diagrams on page 3 to clarify their understanding of what it means for magnets to "attract" and "repel" and on page 4 to visualise how people used lodestones.
- They use indicators of time and their knowledge of past- and present-tense verbs to distinguish between information about magnets in the past and magnets in the present.

#### They make connections between information in the article and their prior knowledge to make inferences and visualise.

- They make connections to their knowledge of Earth having a north and south pole to clarify the use of this term to describe the two ends of magnets.
- They use the page 5 photograph to visualise what a magnet "as big as a room" might look like and how it might be used.
- They make connections between their prior knowledge of magnets (including the introductory discussion) and the information on page 5 (the photograph, the fact that magnets are now made in factories, and the references to big and small magnets) to infer that people have discovered many more ways of using magnets.

#### They ask questions and look for or think about possible answers.

- The students notice information that helps answer their questions from the introductory discussion, and they think of new questions as they read. For example, they might wonder about:
  - how ancient people discovered that some stones attracted metal
  - how knowing where north is helps travellers
  - why a compass has a needle
  - other ways that magnets might be used.

#### They demonstrate self-monitoring and problem solving.


- They use a range of word-solving strategies. For example:
  - they break words into chunks or syllables
  - they use their awareness that letters or letter clusters can have more than one sound (for example, "opposites", "special", "scientist", "electricity").
- They reread and check punctuation and linking words, such as pronouns, to clarify meaning, for example, "They [magnets] do this [attract or repel other magnets] because each end of a magnet is different".
- They mark aspects they want to come back to.

### Deliberate acts of teaching

*How you can support individual students (if needed).*

- Remind the students of strategies they can use for solving unfamiliar words (for example, looking for the biggest known word chunk and applying their knowledge of letters, sounds, and word structure) and for clarifying meaning (rereading or reading on, noticing definitions in parentheses, and checking the photographs and diagrams). Provide specific support as necessary, for example, with the proper nouns.
- Prompt the students to note things they are not sure about or that are of particular interest to discuss after the reading. Reassure them that when reading non-fiction, they may sometimes need to read more slowly, reread parts, and check aspects such as photographs or captions to build their understanding.

### Discussing and rereading the article

You can revisit this article several times, providing opportunities for the students to build comprehension, vocabulary, and fluency. **Select from and adapt** the following suggestions according to your students' needs and responses to the reading. Some of the suggestions overlap, and several can be explored further as after-reading activities.  For some suggestions, you may find it helpful to project the PDF of the story so that you can zoom in on relevant sections. Have magnets and a compass (for example, a compass app on a phone) handy to support the students' understanding as you discuss and reread the text.

- Remind the students of the reading purpose. *What did you find out about magnets and magnetism?* Focus on the explanation of magnetism on page 3. The students could work in pairs to use magnets to replicate what is shown in the diagrams. Remind them of the word "invisible" in the title. *If magnetism is invisible, how do we know about it?* Draw out the idea that although we can't see magnetism, we can see and feel what it can do. Discuss the forces the students can feel but not see as they move the magnets. You could relate this to other things that are invisible such as gravity, oxygen, or sound waves.
- Together, identify and discuss any answers the students found to their questions. Encourage them to share any new questions they thought of as they were reading. Discuss other ways of finding answers to questions that are not answered in the article. Either now or later, you could try out the experiments in this journal or view video clips such as Suzy's World "What makes a compass point north?" to build their understanding.
- Reinforce understanding of topic words by adding definitions to the vocabulary chart created when introducing the text. Find where the words are first used in the text (indicated in several cases by the use of inverted commas) and discuss the supports for their meanings, including the explicit definitions and information in the photographs and captions.

- Have the students reread the article, stopping to discuss points of interest, including aspects they have marked with sticky notes. For example, you could explore:
  - the structure of the report. Support the students to identify the introduction (page 2), the headings that show the focus of each section, and the concluding phrase (“they all have an invisible force”) that refers back to the title.
  - how the diagrams on pages 3 and 4 helped them. Discuss the use of arrows to show movement. On page 4, explain that capital letters (N, S, E, W) are used to indicate compass points. Support them to notice the connection between the compass points in the diagram and those in the photograph. If possible, provide an opportunity for students to practise using a compass.
  - the shifts in time. Support the students to notice on pages 2 and 3, perhaps by reading the heading and a few key sentences, the use of present-tense verbs (“do”, “keeps”, “is”, “are”, “can”). Clarify that these pages are describing what we know about magnets now, in the present. Draw attention to the page 4 heading. *How does this help you know what this page will be about?* Together, underline the words and phrases in the first paragraph that show that this page is about what has happened in the past. Read the rest of the article, prompting the students to notice the clues (indicators of time as well as the use of past- or present-tense verbs) that show whether the text is referring to the present or the past.

For English language learners, you may need to explicitly teach the difference between past- and present-tense verbs.

- how to locate information. Zoom in on one section and create oral questions for the students that are clearly answered in the text, for example, on page 2: *What is magnetism? What are objects that have magnetism called?* Support the students to identify key words and phrases to find the information they need.
- how ideas are linked within and between sentences, for example:
  - » the use of dashes on page 3 to indicate extra information.
  - » the use of pronouns. Read a section together, tracking the pronouns and who or what they are referring to, for example: People also found that if they held up a lodestone and let it swing round, the lodestone would always turn to face north. They discovered that they could use the lodestones to help them find their way on long journeys.
- how the students worked out (or tried to work out) unfamiliar words or phrases. Provide support as required. You could also draw attention to:
  - » the different forms of the word “magnet” (“magnets”, “magnetism”, “magnetic”). Read the sentences where the words appear to clarify their meanings. Together explore some other examples that the students may be familiar with, such as “hero”, “heroic”, “heroism”; “optimist”, “optimistic”, “optimism”.
  - » the importance of reading on to the end of a noun phrase to support word solving and to get the full meaning (“invisible force”, “some metal objects”, “magnetic needle”).
  - » the less common meanings of “face” (used as a verb rather than a noun) and “poles” in this text.
- Note any aspects you might want to follow up on later, perhaps as a mini-lesson or as an after-reading activity.

## After reading: Practice and reinforcement

After-reading tasks should arise from your monitoring of the students during the lesson and provide purposeful practice and reinforcement. Where possible, make links to other texts, including texts generated by the students, and to the wider literacy programme (for example, oral language, writing, handwriting, and word games and activities) and other curriculum areas. **Select from and adapt** these suggestions, according to the needs of your students.

For English language learners, SELLIPS and ELIP also have ideas for purposeful and relevant tasks.

- Provide opportunities for the students to reread this article and to read the linked texts in this journal. You could read library books about magnets to the group or whole class. The students could do the experiments in “Investigating Magnets” or try out the ideas in “Let’s Race”. Note that for some of the activities, plain metal paper clips work better than plastic-coated clips.
- The students can build their comprehension and fluency by rereading the text as they listen to the audio version.
 

Audio versions are particularly supportive for English language learners because, as well as clarifying pronunciation, they provide good models of the prosodic features of English, such as intonation and phrasing.
- Encourage the students to talk with family members about how they use magnets at home. You could use this activity as part of your introduction to “Amazing Magnets”, the second article in this journal.
- Ask the students to write and illustrate the three facts from the article they found most interesting. Alternatively, you could have the students each write three questions for other students to answer.
- Support the students to find and share answers to their questions about magnets that are not answered in the article. (They may discover some answers when they read “Amazing Magnets”).
- The students could paint or draw what “the invisible force” might look like if they could see it.
- Have the students create a glossary using words and pictures or diagrams for terms such as “lodestone”, “compass”, “attract”, “repel”, “poles”.

For English language learners, you could provide cloze reading activities to reinforce new vocabulary or the past- and present-tense verb forms.

- Provide opportunities for the students to learn more about compass points. The humorous play “Buried Treasure” (JJ 53) could be a lighthearted starting point. You could also use the following level 2 maths activity: <https://nzmaths.co.nz/ao/gm2-6-describe-different-views-and-pathways-locations-map>