



Overview

This TSM contains a wide range of information and suggestions for teachers to pick and choose from, depending on the needs of their students and their purpose for using the text. The materials provide many opportunities for revisiting the text.

This engaging article explains what is known about the dinosaurs that once roamed New Zealand. It provides some background information on dinosaurs in general, including the most popular theory about why they became extinct. It also explains that for a long time, people believed no dinosaurs had ever lived in this country. Then it gives details of the dinosaur fossils found in various parts of New Zealand, which proved that idea to be wrong.

The text is broken into small sections, each with a sub-heading posed as a question. These sub-headings will guide students through the text, and are also effective models of the kinds of questions readers ask themselves as they read. Each section provides the information to answer the question posed, and there are tables and a map to support the text.

This article:

- is an informational text about the dinosaurs that lived in New Zealand
- includes the names of people, places, and dinosaur groups
- has non-continuous text, with subheadings in the form of questions
- has tables and a map to support the text
- has a sidebar with additional information and a theory to consider
- includes a glossary.

A PDF of the text and an audio version as an MP3 file are available at www.schooljournal.tki.org.nz

Texts related by theme

“Living Fossils” SJ L2 Oct 2012 | “The Dinosaur Hunter” SJ L3 Sept 2012 | “On the Dinosaur Trail” SJ 4.1.11 | “Mary Anning: Fossil Hunter” SJ L3 Sept 2012 | “The Past beneath Our Feet” SJ L3 May 2016 | “The Evolving Flea” SJ L3 Aug 2013 | “Bird Land” Connected 1 and 2, 2008 | “The Tsunami That Washed Time Away” Connected L3 2014

Text characteristics from the year 4 reading standard

What kinds of dinosaur fossils have been found in New Zealand?

So far, less than twenty fossil bones have been found in New Zealand. None of these bones are complete. They are parts of backbones and tailbones, rib bones, and bones from the forepaws and feet. No skeletons, skulls, or teeth have ever been found.

Luckily, these fossil bones all have special features, so scientists

some abstract ideas that are clearly supported by concrete examples in the text or easily linked to the students’ prior knowledge

What were dinosaurs?

Dinosaurs were **reptiles** that lived many millions of years ago (long before humans lived on Earth). Many dinosaurs were enormous.

The name “dinosaur” means “terrible lizard”, but dinosaurs were not really lizards. Dinosaurs had legs beneath their bodies. Lizards’ legs are on the sides of their bodies. Also, a dinosaur’s skull has a big hole behind each eye for its jaw muscles to go through. Lizards’ skulls don’t have these holes.

a straightforward text structure, such as a structure that follows a recognisable and clear text form

When dinosaurs were living, there were also several kinds of large reptiles in the oceans and other reptiles that flew, but these animals are not classed as dinosaurs. Dinosaurs mostly lived on land. But one group of dinosaurs did something special – they developed feathers and the ability to fly.

Today most scientists believe that those flying dinosaurs are

some compound and complex sentences, which may consist of two or three clauses

What? finger bone of a theropod dinosaur
How old? About 150 million years
Found by Brendan Hayes

Where? Northwest Nelson
What? Dinosaur footprints
How old? About 70 million years
Found by Dr Greg Browne

other visual language features that support the ideas and information, for example, text boxes or maps

VOCABULARY

Possible supporting strategies

- Scientific topic vocabulary: “reptiles”, “lizards”, “skull”, “jaw”, “muscles”, “extinct”, “asteroid”, “fossil”, “skeletons”, “paleontology”
 - Names of people, places, and specific periods from history: “Joan Wiffen”, “Brendan Hayes”, “Dr Jeffrey Stilwell”, “Dr Greg Browne”, “Mangahouanga Stream”, “Hawke’s Bay”, “Port Waikato”, “Chatham Islands”, “Nelson”, “Lower Hutt”, “Te Papa”, “Wellington”, “Tioriori”
 - Dinosaur groups and kinds: “theropods”, “sauropods”, “thyreophorids”, “cerapods”, “dromaeosaurid”, “titanosaurid”, “ankylosaur”, “hypsilophodont ornithopod”
 - The repeated use of the expression “ruled”: “ruled the world”, “ruled the land”, “a land ruled by”
- Model strategies for chunking a long word into syllables to pronounce it. Create a word chart for the topic-specific words. This can be added to during and after the reading.
 - Read the glossary together to support understanding.
 - Scaffold students with researching the meanings of prefixes, for example, “ex”, and suffixes, for example, “sauros” – “lizard”; “poda” – “footed”. This could be an activity that precedes the reading or follows several readings.
 - Write key vocabulary on individual cards and have students work in small groups to arrange the cards into sets based on their spelling/prefixes/suffixes or on the meaning of the words and their relationship to each other.
 - Make a concept map to illustrate the classification of living things.
 Students could use an online mapping tool such as [MindMup](#).
 -  Create a word cloud using a site such as [Wordle](#) or [Word Cloud.com](#) and share it with the students. Use the word cloud for further vocabulary discussion, to make predictions, and to ask questions about the text.
 - Remind students about the use of capital letters for place names and people’s names.
 - Explore the map of New Zealand together to locate the places mentioned.
 You could use [Google Maps](#) to do this.
 - The English Language Learning Progressions: Introduction*, pages 39–46, has useful information about learning vocabulary.
 - See also [ESOL Online, Vocabulary](#), for examples of other strategies to support students with vocabulary.

SPECIFIC KNOWLEDGE REQUIRED

Possible supporting strategies

- Some understanding of difficult abstract concepts such as: periods of millions of years, fossils provide scientific information, scientific theories change, classification of living things, not all scientists think the same
- Provide opportunities for the students to consider and respond to the concepts in pairs and small groups, for example, by creating charts with scaled timelines.
 - Prompt mathematical knowledge to support understanding of the metric system and numbers larger than one million.
 - Discuss how scientists work, introducing or revisiting the concepts of theories and evidence and how theories can change when new evidence is found.

TEXT FEATURES AND STRUCTURE

Possible supporting strategies

- The use of subheadings in the form of questions
 - Short paragraphs that answer the questions and support the reader to deal with small amounts of information at a time
 - A labelled map and tables
 - Clear topic sentences
 - A glossary
- Prompt prior knowledge about non-fiction articles. *What features can we expect to find in this text?*
 - When discussing the visual language features, prompt critical thinking and discussion about why there are no actual photographs of any dinosaurs but we have an idea of what they might have looked like.
 - Direct students to the subheadings and clarify the question format. *Are the questions useful? Do they ask what we need to know?*
 - Have students locate the topic sentence, then clarify the purpose and the usefulness of the topic sentence in setting the reader up for further information. (If the students have difficulty with this, photocopy a paragraph, cut it up into individual sentences, and have them work in pairs to reconstruct the paragraph. This will help them identify the topic sentence and the supporting ideas. Once students can confidently reconstruct one paragraph, they could do the same with two or more paragraphs.)



Possible curriculum contexts

ENGLISH (Reading)

Level 2 – Ideas: Show some understanding of ideas within, across, and beyond texts.

– Structure: Show some understanding of text structures.

ENGLISH (Writing)

Level 2 – Ideas: Select, form, and express ideas on a range of topics.

– Structure: Organise texts, using a range of structures.

SCIENCE (Living World)

Level 2 – Evolution: Recognise that there are lots of different living things in the world and that they can be grouped in different ways.

– Explain how we know that some living things from the past are now extinct.

Possible first reading purpose

- To learn more about the dinosaurs found in New Zealand.

Possible subsequent reading purposes

- To explore how the organisation of the text helps us to find information
- To use maths knowledge to make sense of periods of time and of size
- To consider and explore how scientific theories change when new evidence is discovered.

Possible writing purposes

- To write an article about a particular dinosaur that interests you, using sub-headings, text boxes, and labelled illustrations
- To write an explanation of what you think happened to the dinosaurs.



Instructional focus – Reading

English Level 2 – Ideas: Show some understanding of ideas within, across, and beyond texts; Structure: Show some understanding of text structures.

Science (Living World) Level 2 – Evolution: Recognise that there are lots of different living things in the world and that they can be grouped in different ways; Explain how we know that some living things from the past are now extinct.

First reading

- Set the purpose for reading.
- Prompt the students to share what they know about different kinds of dinosaurs and where they have been found. If necessary, refer to the section “Text and language challenges” for suggestions on how to support students’ background knowledge.
- Skim and scan the article together, looking at the bold headings and the visual text.
- Draw attention to the headings used as questions and how they help you think about the information in the accompanying paragraph.
- Prompt the students to identify the main topic.
- Read the first page together and prompt a response to the last sentence.
- Encourage the students to make links to what they know and to make predictions about the information the article is going to provide.
- Have the students finish reading the article on their own. Give them stickies to mark any points they are unsure of or would like to find out more about.

If the students require more scaffolding

- Activate the students’ prior knowledge about the topic. *Have a chat with your partner. Share some ideas and we’ll see what we already know about dinosaurs.*
- Prompt students to recall what they expect from an article – facts, information, diagrams, labels, subheadings, and so on.
- Use the word cloud activity described in “Text and language challenges: vocabulary”.
- Model thinking aloud. *The title is “New Zealand Dinosaurs”. These sub-headings are questions. They are the sorts of things I want to find out as I’m reading. I expect that the text will answer the questions.*
- Have the students read the first page and provide opportunities for wondering. *This makes me wonder what it was that changed scientists’ minds. We don’t really have any clues. What do you think might have happened?*
- Focus on the number 150 million and acknowledge the challenging concept. *It’s hard to even imagine 150 million years.*
- You could introduce the concept of the history of Earth being a 24-hour clock. *If you take the whole history of Earth as being 24 hours, dinosaurs would appear just over an hour before midnight. Humans would appear in the last 2 minutes before midnight.*



“Evolution of Life on Earth” – this short video by AsapSCIENCE condenses 4.5 billion years into 2 minutes. (Check before you use this with your students – the language level may be challenging for some students, especially English language learners.)

Subsequent readings How you approach subsequent readings will depend on your reading purpose.

The teacher

Lead a discussion with the students to recognise the purpose of subheadings, diagrams, and tables. Explain that the writer has organised the ideas in a particular way. Focus on the subheadings and point out the use of questioning.

Have the students respond to a scavenger hunt, using the subheadings.

- Which subheading would have the answer?
 - How many kinds of theropods were found?
 - What group does an ankylosaur belong to?
 - How long ago did dinosaurs become extinct?
 - What does the name dinosaur mean?
 - What evidence is there that birds are related to dinosaurs?

A text reconstruction activity will help the students understand the purpose of the title and subheadings and how to group information. Copy the article and cut it into separate parts – the title, subheadings, paragraphs, diagrams, and illustrations. Have the students work in pairs or small groups to recreate the article. They can compare theirs with the original text and discuss what helped them decide what belonged where.

The teacher

Discuss the use of tables and diagrams to display information.

- What information in the map and diagrams is new and what information has been mentioned in the text already?
- How do the diagrams, tables, and maps help you to understand more about the dinosaurs?

The students:

- identify the features that help them to understand of the information in the text
- discuss with a buddy what information they expect to find out from each sub-heading
- work in pairs to locate information in response to a clue, and identify the section and subheading
- read each section and confirm whether the information they expected to find is there.

The students:

- use the diagrams on page 18 to clarify the information in the text about the differences between dinosaurs and lizards
- locate the examples in the tables that accompany the map on page 24 and use the tables to make comparisons, for example, about where the fossils were found, the age of each piece of evidence, and what evidence was found
- notice the repeated headings in the table and describe their purpose
- discuss how evidence provides information
- link the information in the text with additional information in the map and diagram.

Subsequent readings (cont.)

The teacher

Direct students to the opening paragraph. It says that for a long time, scientists thought that no dinosaurs had ever lived in New Zealand. Why was that?

Lead a discussion about how scientists develop their theories.

- *What is evidence?*
- *What is a theory?*
- *Why do scientists change their ideas?*
- *Do all scientists agree with each other?*

Have the students work with a partner to find examples in the text that show how scientists work and how their ideas can change. They could complete a table showing the text and what conclusions they can draw from the text about scientists and scientific theory. (The students could work on a printout of the PDF version of the text and use a highlighter to mark and number the sections of text.)

 Alternatively, they could cut and paste the text into a [Google Doc](#).)

The students:

- work with a partner to find text that gives information about scientists and scientific theories
- complete a table like the one below that shows what conclusions can be drawn from the text.

Text	What this tells us
There are many ideas about why they disappeared, but nobody is completely sure. Most scientists think that the dinosaurs all died after a large meteorite crashed into Earth from space.	Not all scientists agree. There can be more than one theory to explain the same thing.
Then, in 1975, Joan Wiffen found the first dinosaur fossil in New Zealand.	Scientists change their ideas when they find new evidence.
... these fossil bones all have special features, so scientists can work out what kind of dinosaur each bone belongs to.	Scientists compare evidence with what they already know.
They can work out what group each fossil came from, but they can't always tell exactly what kind of dinosaur it was.	Scientists group animals into large groups and smaller sub-groups.
Today most scientists believe that those flying dinosaurs are still with us. But instead of calling them dinosaurs, we call them birds. This idea was first put forward in the 1970s.	Scientists put forward new ideas about things. Not all scientists agree.

GIVE FEEDBACK

- *It was great to see you using skimming and scanning to locate the information you were looking for. It's a really useful strategy to use for non-fiction articles like this one.*

METACOGNITION

- *Has this article made you want to find out more about dinosaurs in New Zealand? Where would you go to find out what you want to know?*



Reading standard: by the end of year 4



The Literacy Learning Progressions



Assessment Resource Banks

Instructional focus – Writing

English Level 2 – Ideas: Select, form, and express ideas on a range of topics; Structure: Organise texts, using a range of structures

Text excerpts from “New Zealand Dinosaurs”

Examples of text characteristics

Teacher (possible deliberate acts of teaching)

Page 19

What happened to the dinosaurs?

Dinosaurs became extinct about 66 million years ago. There are many ideas about why they disappeared, but nobody is completely sure. Most scientists think that the dinosaurs all died after a large meteorite crashed into Earth from space.

TEXT STRUCTURE: PARAGRAPHS AND SUBHEADINGS

Writers make it easier to follow a non-fiction text by organising their ideas into paragraphs. Each paragraph usually has a topic sentence that states the main idea of the paragraph. The rest of the paragraph adds details or explains more about the main idea of the topic sentence.

Writers also use subheadings to organise the paragraphs into sections to make the text easier to follow. Each subheading signals a new section. Writers sometimes use questions as subheadings. The details they include in each paragraph should answer the question in the subheading.

Explain how writers organise their ideas into sentences and paragraphs.

Direct the students back into the text to examine one paragraph. Consider using a text or paragraph reconstruction activity here.

- *What is the main idea?*
- *What is the topic sentence?*
- *What do the other sentences in the paragraph do?*
- *How are they related to the main idea?*

Discuss the use of subheadings in the article.

- *What has the writer done with the subheadings?*
- *Do the ideas that follow answer those questions?*
- *Is this a useful way to organise the information? Why/Why not?*

Ask the students to add subheadings to a piece of their own writing.

- *How many subheadings will you need?*
- *Does the content in each paragraph match the subheading?*
- *Do you need to reorganise your writing to make the subheadings work?*
- *Will you use a question as a subheading?*

Page 25

When dinosaurs were living, there were also several kinds of large reptiles in the oceans and other ones that flew, but these animals are not classed as dinosaurs. Dinosaurs mostly lived on land. But one group did something special – they developed feathers and the ability to fly.

Today most scientists believe that those flying dinosaurs are still with us. But instead of calling them dinosaurs, we call them birds. This idea was first put forward in the 1970s. Like that special group of dinosaurs, birds have feathers. Bird skulls are also very like dinosaur skulls, and birds have legs beneath their bodies, too.

SUPPORTING DETAILS

Writers include details to clarify an idea. In non-fiction texts, the details support the meaning for the reader and sometimes provide an extra concept to consider.

Direct the students to the section of text. Unpack that section together, gathering the key points that the text provides. Use further questions to guide students.

- *What do we find out in these paragraphs?*
- *Do the details clarify the main ideas or are they interesting “extras”?*

Strengthen the links between reading and writing by supporting students to make connections.

- *When we are writing, we choose which details to include, and which to leave out. We consider what our reader will be interested to find out.*

Have the students share their first draft with a partner to receive peer feedback on the details they have included (or missed out).

- *As you listen to your partner’s draft, notice whether they have given you enough information.*
- *Are the details useful for you to understand what they are telling you?*
- *Do you need more information about anything?*

Text excerpts from “New Zealand Dinosaurs”

Page 18

The name “dinosaur” means “terrible lizard”, but dinosaurs were not really lizards. Dinosaurs had legs beneath their bodies. Lizards’ legs are on the sides of their bodies. Also, a dinosaur’s skull has a big hole behind each eye for their jaw muscles to go through. Lizards’ skulls don’t have these holes.

Examples of text characteristics

DESCRIPTIVE LANGUAGE

Writers choose specific words to describe things clearly in a scientific description.

Teacher (possible deliberate acts of teaching)

Discuss what is meant by description. Prompt students’ prior knowledge through questioning, building on what they already know.

- *Where do we find examples of description?*
- *When we are writing as a scientist, we need to describe by choosing precise, specific names for things. What do we find out about the skull of a dinosaur?*
- *So what is the difference between lizards and dinosaurs? What words help us to be precise?*
- *Go back to your writing and look for places where you need more precise descriptions. Have a go at rewriting those sentences, and then share with your buddy to see if those changes make your writing clearer and more descriptive for the reader.*

Some English language learners may benefit from giving oral descriptions before attempting written ones. Have them describe some of the illustrations to a partner. Monitor what they say, listening for language gaps. Provide explicit language teaching to help them understand the grammar point. For example, it may be using the right preposition, the order of the adjectives in the noun group, or which article (a, an, the) or pointing word (this, that, these, those) to use. You may need to provide language scaffolds such as sentence frames until they are confident.

GIVE FEEDBACK

- *I see that you have included an extra detail and used brackets. It’s an interesting fact. I think your readers will enjoy that and it will add to their understanding.*

METACOGNITION

- *What helped you choose how to organise your text? Will your readers need to consider the order in which they read the sections? How might you make that clear?*

Writing standard: by the end of year 4

The Literacy Learning Progressions