

Climate Change: Our Biggest Challenge

by Tricia Glensor

School Journal
Level 4, June 2018
Year 8



Overview

This TSM contains 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 material provides many opportunities for revisiting the text.

This article explains what climate change is and why the author believes human-induced climate change is the biggest challenge the world has faced. It explains the greenhouse effect and the reality that continued climate change is inevitable, given the high level of greenhouse gases already in the atmosphere. However, it finishes on a positive note, explaining what governments, scientists, community groups, and individuals can do to lessen the impact of climate change by reducing greenhouse gas emissions.

This article:

- provides facts and information about climate change and its impact
- supports students to understand and think about how to address a complex problem that requires the combined expertise of a lot of people
- includes a short interview with Jan Wright, the former Parliamentary Commissioner for the Environment
- has diagrams and photographs that clarify or extend the text
- has non-continuous text with subheadings.

A PDF of the text is available at www.schooljournal.tki.org.nz

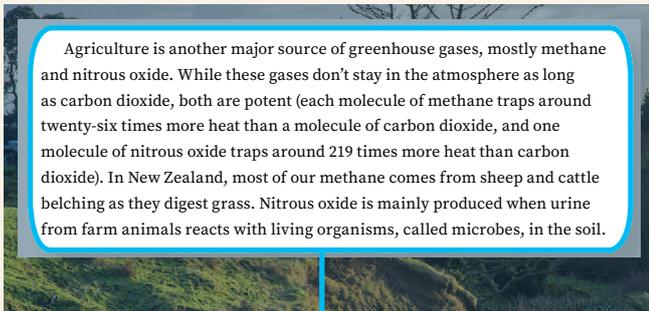
Texts related by theme

“The Village” SJ L4 June 2018 | “The Great Barrier Reef: See It While You Can” SJ L4 May 2013 | “The Subantarctic Islands” SJ L3 August 2017 | “Frogs” SJSL L4 2013 | “Captured in Ice” *Connected* L3 2017 | “Global Action” *Connected* L4 2017 | “Rising Seas” *Connected* L3 2014

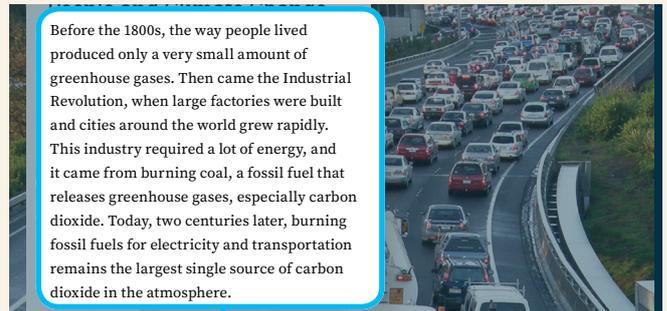
Text characteristics from the year 8 reading standard

We have retained the links to the National Standards while a new assessment and reporting system is being developed.

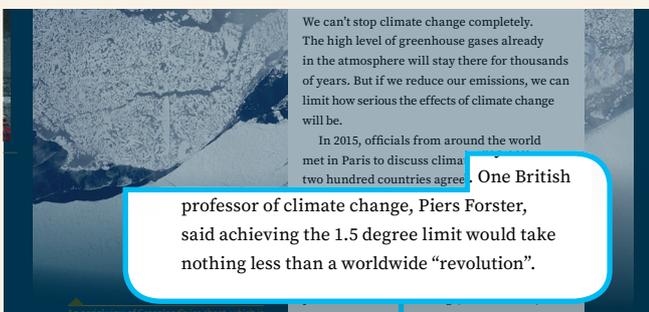
For more information on assessing and reporting in the post-National Standards era, see: <http://assessment.tki.org.nz/Assessment-and-reporting-guide>



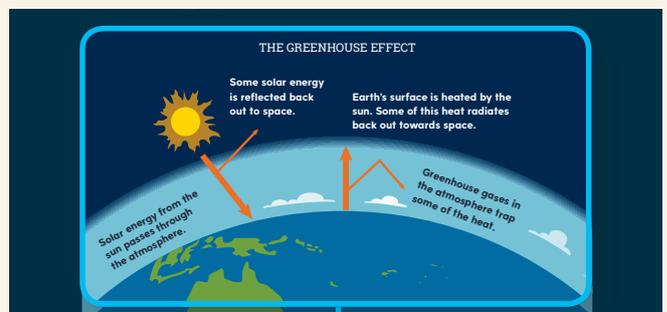
complex layers of meaning, and/or information that is irrelevant to the identified purpose for reading (that is, competing information), requiring students to infer meanings or make judgments



academic and content-specific vocabulary



metaphor, analogy, and connotative language that is open to interpretation



illustrations, photographs, text boxes, diagrams, maps, charts, and graphs, containing main ideas that relate to the text's content



Reading standard: by the end of year 8

VOCABULARY

- Scientific and technical vocabulary, including “Climate change”, “ice sheets”, “greenhouse effect”, “natural process”, “carbon dioxide”, “methane”, “nitrous oxide”, “atmosphere”, “radiates”, “fossil fuels”, “Deforestation”, “emissions”, “carbon sinks”, “potent”, “molecule”, “microbes”, “organisms”, “ecosystems”, “1 degree Celsius”, “coastal erosion”, “global warming”, “zero greenhouse gas emissions”, “pastoral agriculture”, “1080 poison”, “investigating”, “acidic”, “electric-powered car”
- Other possibly unfamiliar words and phrases, including “southerly gale”, “distant future”, “ice age”, “problematic”, “ambitious”, “vulnerable”, “contaminated”, “climate change refugees”, “revolution”, “slash”, “higher aim”, “radical policies”, “radical change”, “plight”, “for granted”, “retired”
- Names of people, events, and places, including “Industrial Revolution”, “South Island’s West Coast”, “Bangladesh”, “Paris”, “British professor of climate change, Piers Forster”, “Greenland”, “Kiribati”, “Riibeta Abeta”, “South Tarawa”, “United Kingdom”, “Generation Zero”, “Parliamentary Commissioner for the Environment, Jan Wright”
- Metaphorical/abstract language, including “alarming rate”, “a worldwide ‘revolution’”, “pledged to slash its greenhouse gas emissions”, “everyone needs to step up”, “more people are waking up to the problems we face”

Possible supporting strategies

- Identify words and phrases that are likely to be unfamiliar to your students.
- Explain that this article has a lot of scientific and technical vocabulary, but it doesn’t have a glossary. Instead, key words are explained in the text. Prompt the students to recall the strategies they can use to work out word meanings, such as:
 - using the context and or reading on to see if the meaning becomes clear
 - looking for base words, prefixes, suffixes, chunks, or word families.
- As the students read, have them note words that are unfamiliar. Work together to construct a class glossary of topic-specific words. Challenge the students to draw pictures to illustrate what the words mean. Keep the glossary on display as you engage with this text.

 You could use a Google Doc so that the glossary can be constructed collaboratively and projected for the whole class to see.
- Students could find and insert images into the class Google Doc glossary.

 Use Google Maps to identify the places mentioned in the article and help the students understand that this is a global problem.
- 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

- Some knowledge of climate change and its impact
- Some familiarity with related concepts, such as the greenhouse effect
- Some understanding that human beings, like all living things, have evolved to live in particular habitats
- Some understanding that all living things find it difficult to adapt to rapid environmental change
- Some familiarity with slogans about keeping New Zealand clean and green
- Some familiarity with concepts about social action

Possible supporting strategies

- Discuss the title of the article and have the students think, pair, and share what they know about climate change and how they know it. Some students may have experienced what they believe to be direct experience of its impact, such as seeing the effect of rising seas on a nearby beach.
- English language learners could view an online video explaining the greenhouse effect prior to reading. This will help them to connect their prior learning with the content of this text and to build their academic vocabulary. Consider students’ level of English language, age, and prior knowledge when making decisions about which video is most appropriate to view. You can find some examples here:
 - https://www.youtube.com/watch?v=BPJJM_hCFj0
 - <https://www.youtube.com/watch?v=7mADYuCHf7M>
- Prompt discussion about whether climate change really is our biggest challenge. You could ask the students to stand on a continuum to indicate whether they agree or disagree with the statement. Ask them to explain the reason for their stance.
- Invite the students to share what they know about the idea of keeping New Zealand clean and green. *When have you heard this message, or a version of it? What do you think of this message? Is New Zealand really “clean and green”? What makes you say this?*
- Focus on the statements about radical change and the need for a worldwide “revolution”. Start by unpacking what the students know about the Industrial Revolution (page 5) and the extraordinary changes that took place in western countries from around 1760 to 1840. If you haven’t already done so, explore the word “revolution” and find synonyms. Connect this discussion with the term “radical change”.

TEXT FEATURES AND STRUCTURE

- A strong authorial point of view that is supported by facts and figures and incorporates the perspectives of other authorities
- Complex ideas and information that have been carefully structured so that new information comes on a “need-to-know” basis
- Informative headings that provide a summary of what is to follow
- Captions that reiterate key points
- Extensive use of “transition signals” to link sentences and paragraphs and make it easier for the reader to follow the ideas, for example, “Over the last century” (to indicate time), “But think again” (indicates a contrasting idea), “Climate change also” (to add more information), “Understanding climate change means understanding” (to introduce a similar idea), “In recent years, however” (to introduce an opposing idea), “and it’s caused by people” (to indicate cause and effect), “In turn, this impacts” (to indicate sequence), “such as Bangladesh” (to refer to a specific example), “especially vulnerable” (to provide emphasis)
- The direct address (and challenge) to the reader that quickly dispels a myth about any possible positive impact of climate change: “But think again”
- The repetition of key words and phrases, for example, “climate change”, “greenhouse gases”
- Three diagrams to support the text

Possible supporting strategies

- Prepare the students for the fact that this is a complex topic and this article has a lot of information. Explain that several readings will be necessary to get a full understanding of the content.
- Skim the article with the students to help them get a sense of its structure and purpose. Prompt them to use the headings to predict the focus of each section and use the captions to identify what the visual images show.
- Write the headings on a whiteboard to help the students notice how the information has been organised. Prompt them to observe the way the writer has sought to logically build our understandings about what climate change is, what causes it, its impact, and what can be done about it.
- A vanishing cloze activity is a fun way of supporting students to notice and take advantage of the support provided by the transition signals. Select a short piece of text, such as the introductory paragraph, and write it on the whiteboard. Point out the transition signals and explain their purpose. As a group, read the text together chorally several times until the students are very familiar with it. Then erase one or two of the transition signals. The students then choral-read the text again, saying the missing words as they read. Keep erasing more of the signals and rereading the text until all the transition signals have been erased.
- Select another paragraph and have the students work in pairs to locate the transition signals and identify their purpose, for example: “But people can change, and governments are responding, ... has decreased its emissions by 38 percent.
- Once students are familiar with transition signals, using text reconstruction tasks will help students to notice the transition signals used in this text. Have the students reconstruct sentences from the text into paragraphs, or paragraphs into whole texts, depending on your teaching focus. Select a suitable piece of text. Cut it up into sentences or paragraphs, mix them up, and have the students try to put them back into the correct order without referring to the original text. Once completed, the students discuss their reconstruction with a partner and then compare their own with the original text.



Sounds and Words

Possible curriculum contexts

ENGLISH (Reading)

Level 4 – Ideas: Show an increasing understanding of ideas within, across, and beyond texts.

ENGLISH (Writing)

Level 4 – Purposes and audiences: Show an increasing understanding of how to shape texts for different purposes and audiences

SCIENCE

Level 4 – Nature of Science: Participating and contributing: Use their growing science knowledge when considering issues of concern to them; Explore various aspects of an issue and make decisions about possible actions.

Level 4 – Living World: Ecology: Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human-induced.

Possible first reading purpose

- To find out the processes and causes of climate change and why the author thinks it is our biggest challenge.

Possible subsequent reading purposes

- To identify the impact of climate change on New Zealand and other countries
- To identify ways various groups of people and countries are dealing with climate change
- To explore how visual images such as photographs and diagrams enhance our understanding of complex issues .

Possible writing purposes

- To write a paragraph explaining your understanding of the causes and effects of climate change
- To develop a flow chart showing the causes and effects of climate change
- To write a response to the article outlining your opinions about how your class, your school, or your community could take action to raise awareness of climate change.



The New Zealand Curriculum

First reading

- Share the purpose for reading with the students.
- Provide a brief overview and explain that this is a very informative text about a very important subject, so you will take the time to work through it together over several readings.
- Read the first paragraph together and have the students identify and respond to the main idea (“Climate change is here, and it’s the biggest challenge the world has ever faced”). Consider the continuum approach suggested on page 2 of these notes.
- Have the students use a KWL chart to record what they think they already know about climate change (K) and what they want to find out (W). As they read and find answers to their questions, they record what they’ve learnt (L). When they finish reading, have them evaluate their initial thoughts and discuss with a partner how their thinking has changed. They could record their findings as “What I now know”.
 The students could create their KWL chart as a [Google Doc](#) so that they can add to it and share it with others.
- Skim and scan the rest of the text together, focusing on the various features and how they are used. Use “think-alouds” to invite responses. *Why do we have that big, dark spread on the first two pages? The sky is full of dark clouds. They look menacing. What do you think? In that photo, Jan Wright is standing on a rock by the ocean. I wonder why?*
- Most students will benefit by taking a shared reading approach to their first encounter with this text, but others might work in pairs. Either way, take the article one section at a time.
- After reading each section, prompt the students to ask each other questions to find out how the information connects with things they already know and to see if they have any shared questions about the content. Record the students’ questions for discussion in subsequent readings.

If the students require more scaffolding

- Use a shared reading approach and provide focused guiding questions for each section, for example:
 - *On page 1, the writer tells us to think again. Why does she want us to do that?*
 - *The first diagram is “The Greenhouse Effect”; the subheading is “Understanding Climate Change”. Why does the writer want us to know about this? How will it set us up for understanding the rest of the article?*
 - *Let’s take another look at the text on page 7: “1 degree Celsius”. That really doesn’t sound like much. Why does the writer claim that this is a bigger problem than it sounds? How does the diagram help you to understand the text?*
 - *On page 8, we read about the effect of climate change on the people in Kiribati. What do you imagine it feels like to be at risk of becoming a climate-change refugee?*
 - *Bangladesh is another place where people are experiencing more floods. Both Bangladesh and Kiribati are low-lying. What else do they have in common? (Draw out that both are poor countries and have contributed very little to the problem of climate change.)*
 - *How do you respond to the statistics on page 10? What questions does this information raise for you? Do you agree with Generation Zero and their campaign for zero carbon emissions by 2050? What makes their campaign “radical”?*
 - *What is the main message of the final section? Why has the writer included information from an interview with Jan Wright?*
- Take note of sections, ideas, visual features, sentence structures, and vocabulary that are challenging for students and focus on clarifying these in subsequent readings.

Subsequent readings How you approach subsequent readings will depend on your reading purpose. Where possible, have the students work in pairs to discuss the questions and prompts in this section.

The teacher

Focus on the diagrams and photographs. Prompt the students to recall and share what they know about how to get meaning out of visual images. Put the students in groups and give each group a double-page spread to focus on. Ask questions to help them think critically about the images on their spread:

- *What does this image show? What can you see? What can you read?*
- *Why is the image there? How does it connect to the text?*
- *How effective is this image in adding to your knowledge or clarifying an idea?*
- *How helpful was the caption and any other words in helping you to understand the information in the image?*
- *Is this the photograph you would have selected or the diagram you would have drawn? How might this image have been improved?*

Ask them to analyse the images on their spread, reread the text, and then prepare a presentation to the class in which they explain why the images are there, what they mean, and how they work with the text to help communicate important ideas.

The students:

- identify the purpose of the visual images in this article
- analyse how each of the visual images helps to convey meaning
- think critically about whether the visual images have achieved their purpose
- explain the visual images to the class and share their opinions about their value.

Subsequent readings (cont.)

The teacher

Point out that the article includes a range of perspectives, both implicitly and explicitly. Have them create a chart like the one below to show the author's perspective and then the perspectives of the other individuals, groups, and nations to which she refers.

Person/group	Perspective
Tricia Glensor	
The people of Bangladesh	
Riibeta Abeta and the people of Kiribati	
The Paris climate change conference	
Piers Forster	
Generation Zero	
Jan Wright	

Discuss how these perspectives add to the article.

- *Why has the writer included so many different points of view?*
- *Why has she chosen to include these people's perspectives?*
- *Are there other points of view you would like to know more about? Whose?*

The students could take part in a Hot Seat activity that requires them to justify a position on climate change or to take on the role of a particular person in the text.

The teacher

Support the students to review their KWL charts and then update them with what they have learnt from subsequent readings and note any questions they might still have.

Have the students discuss the various ways they might organise what they have learnt. Then have them work in pairs to decide on three or four headings and write summaries of the information. Ask each pair to swap their summaries with another pair and give feedback on how well they have captured the main ideas.

Consider following up the students' questions with further inquiry. You can find suggestions for scientific inquiry on climate change in the Connected articles listed on page 1 of this TSM (Texts related by theme).

The teacher

Revisit the discussion about whether climate change really is "our biggest challenge". You could repeat the continuum exercise (page 2) and prompt the students to explain any firming or change in their position, drawing on what they have learnt. Extend their thinking: *You said there needs to be change? How much change? Do you agree with people like Generation Zero that it needs to be radical?*

METACOGNITION

- *Looking at your questions, which was the most important to you? Where did you find information to answer this question? Do you feel satisfied with the answer you have? What other reading might you do to find out more?*
- *How did this diagram help you to understand the text? Could it have been improved? What is another way the same information could have been conveyed?*

The students:

- locate information and draw inferences to understand the perspectives of different people and groups whose views are represented in the text
- think critically about why the author chose to include these perspectives and what other perspectives she might have included.

The students:

- review their KWL charts and reflect on what they have learnt since the first reading
- synthesise what they have learnt to summarise the main ideas
- identify questions for follow-up inquiry.

The students:

- think critically about the author's message
- locate, integrate, and evaluate evidence in the article to decide on and justify their personal point of view
- engage in respectful debate about a major global issue.

GIVE FEEDBACK

- *I noticed you rereading the section on the greenhouse effect after you'd taken a closer look at the diagram. I could see that you integrated what you learnt from the diagram to make better sense of the written text.*
- *You considered the evidence in the article and brought to it your family's observations about how weather patterns seem to be changing. The family connection really brought the science to life.*



Reading standard: by the end of year 8



The Literacy Learning Progressions



Assessment Resource Banks

Instructional focus – Writing

English Level 4 – Purposes and audiences: Show an increasing understanding of how to shape texts for different purposes and audiences.

Text excerpts from “Climate Change: Our Biggest Challenge”

Page 7

Climate Change: Impact

Burning fossils fuels, deforestation, and agriculture – these activities mean our planet and oceans are now around 1 degree Celsius warmer than they were a century ago. This is a much bigger problem than it sounds. Even a small change in temperature affects Earth’s weather and ecosystems. In turn, this impacts our food sources and our health.

Examples of text characteristics

EXPLANATION USING TEXT

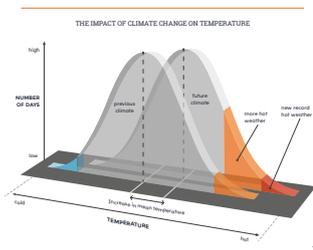
Informational texts often feature explanations. These tell how or why a process or phenomenon happens. They follow a logical sequence and illuminate cause and effect. This example could also be described as persuasive. The writer takes a stand and justifies it.

Teacher (possible deliberate acts of teaching)

Support the students to select a person or individual who would be an appropriate audience for a piece of writing explaining the causes and effects of climate change. Discuss what they would want to communicate and how.

- What are the most important facts to include?
- How will you convince your reader that these are facts and not opinions?
- How will you signal the relationship between the causes and effects?
- Why is it important to know this?
- Are there any “myths” you may need to dispel?

Page 7: diagram



EXPLANATION USING DIAGRAMS

A diagram is a drawing that illustrates or explains something, such as an idea, machine, or system. It is intended to clarify information. Writers use diagrams to explain something that is difficult to show in words alone.

As a class, focus on the diagram on page 7. This is a particularly difficult one to interpret. Encourage groups to work together to create an alternative diagram that communicates the same information. Bring the groups back together. Have them share their alternative diagrams and select the one they think is best.

- How has this added to your thinking about what makes for an effective diagram?
- What are some criteria we could create?

Have the students work independently to create diagrams that will integrate with their written explanations of the cause and effects of climate change. If necessary, provide and talk to some examples, such as flow diagrams. Support the students to use their criteria to evaluate the effectiveness of their diagrams.

DIGITAL TOOLS The students could create a digital flow chart using [MindMup](#).

Page 3

Over the past century, our planet has been getting warmer. When you’re playing winter sports in a southerly gale, this might not seem like a bad thing. But think again. Climate change isn’t only about warmer weather. A rise in the temperature means more extreme weather, including wild storms and heatwaves. Climate change also means more frequent droughts and wildfires, melting ice sheets, melting glaciers, and flooding. These things aren’t waiting for us in the distant future. Climate change is here, and it’s the biggest challenge the world has ever faced.

PERSUASIVE WRITING

Persuasive writing is intended to persuade the reader to adopt a particular viewpoint or act in a particular way. To be effective, the writer must present a logical argument and support it with facts.

Discuss the difference between straightforward factual writing and writing that is intended to persuade.

- Where does this article sit?
- What is the writer’s argument?
- How does the writer seek to persuade us?

The students could write a piece of persuasive writing about ways their class, school, or community could take action to raise awareness of climate change. It might be in the form of an essay, structured logically and supported by facts as modelled by the article. Alternatively, you could make connections to other persuasive writing formats the students have encountered, such as posters, poetry, graphic novels, or blogs. There is potential for this to be an authentic piece of writing, intended to bring about specific changes that the “average person” could make.

DIGITAL TOOLS The students could use a digital tool such as [Postermywall](#) or [Google Slides](#) to create their poster or use [Blogger](#) (a simple blogging platform within the Google Apps For Education environment) for writing their blog.

Ensure that your English language learners understand how to structure an argument in English: thesis (the statement of the writer’s opinion), point (1) and elaboration, point (2) and elaboration, and so on, then a final reiteration of the thesis. Provide model texts to explain the structure and use joint or guided writing to model writing an argument. Using a graphic organiser to organise their main points and each supporting idea will help.

GIVE FEEDBACK

- You’ve been clear about your opinion, and you’ve provided good evidence to support it. That helped to make your argument convincing.

METACOGNITION

- What did you want people to know through your diagram? What did you do to make sure the diagram