



Learning intention or WALT

Identify some key impacts of climate change on the world.



Estimated time – 55 minutes



Key words

Earth (Papatūānuku) • Arctic Circle • Antarctic Circle • Pacific Island nations • Starvation
Dehydration • Habitat • Emissions • Predator • Extinction • Erosion
Tūrangawaewae (our place to stand, our home)



Success criteria

- I can read graphs that show how the Earth's temperature is increasing
- I can examine Earth's polar regions and describe the changes I see
- I can explain the impacts of climate change on people, animals and places

Learning experience



Class discussion and video 10 minutes

- 1 Introduce the lesson: *Last time we learned about climate change and what is causing it. In this lesson we're going to learn about the impacts that climate change has on the world.*
- 2 Ask students what else they remember from the last lesson: Do they remember the four main greenhouse gases?
Answer: Water vapour, carbon dioxide, methane and nitrous oxide
- 3 Read and discuss the learning intention or WALT and success criteria for this lesson (page 1). Ask students questions relating to this lesson to see what they already know:

What is the difference between Earth and the world?

Answer: Earth is the planet itself, the sphere that revolves around the sun. The world refers to all the people, places and things that are on Earth.

Where are the Arctic Circle and the Antarctic Circle?

Answer: The Arctic Circle encircles the northernmost regions of Earth (and includes parts of Canada, Greenland, Russia, Norway, Sweden, Finland and the Arctic Ocean). The Antarctic Circle surrounds the continent of Antarctica at the southernmost part of the world.

What do both the Arctic Circle and Antarctic Circle have in common?

Answer: Both areas are largely covered in ice (although the Arctic is mainly sea ice, the Antarctic is a continent covered by a thick ice sheet).

- 4  As a class watch this video: [The causes and effects of climate change](#) (3:00 minutes, National Geographic).

Ask students about the video:

Why have carbon dioxide (CO₂) levels in the atmosphere increased so much?

Answer: Humans are burning fossil fuels (coal, oil and natural gas).

What effects of climate change were mentioned in the video?

Answer: Some examples are increased temperatures, melting ice sheets, coastal flooding, more extreme weather, longer droughts, less water to grow crops and smog.

Where do you find polar ice?

Answer: Polar ice is found in the Arctic and the Antarctic (In the Arctic it is called sea ice because it is made from salt water and on land on Antarctica it is called land ice or polar ice sheets).



Independent online learning 15 minutes

- 5 Page 2: From the '[Climate Time Machine](#)' (NASA website) students go to 'Global Temperature' to see how temperatures have changed since 1884 (indicated by the increasing amount of yellow/red on the globe). Students then go to 'Sea Ice' and see how arctic ice has changed from 1979-2022. Students are then asked to write down their answers to 2 questions (page 3):

What has happened to the temperatures around the world since 1884 and where is this particularly noticeable?

Answer: Since 1884 global temperatures have increased. This is particularly noticeable at the Arctic Circle.

What has happened to the Arctic Sea ice since 1979?

Answer: It has reduced.

- 6 Students read that polar ice is melting, causing sea levels to rise and islands in the Pacific Ocean to sink. Students read about this impact on Pacific Island nations and Tuvalu in particular. They watch a YouTube [video](#) (1:28 minutes) of Tuvalu's Foreign Minister knee-deep in the sea to show what could happen in the future (pages 4-5).

- 7 Students drag and drop missing descriptions to complete the table below about weather events (page 6). **Answers in bold:**

	Cyclone	Flood	Wildfire	Heatwave	Drought
Weather event	Intense circular storm that can cause heavy rain and strong winds.	Overflow of water onto dry land.	A big fire that spreads quickly over bush.	Long periods of very hot temperatures.	Long periods with abnormally little rain.
What happens?	Trees are ripped out and buildings are destroyed.	Crops are damaged, buildings are filled with water which could cause disease to spread and drowning.	Land and buildings burn, habitats are destroyed, and animals are killed.	It can be hard for people, animals, crops and livestock to stay cool; they could die.	Not enough water for crops and livestock; they could die from dehydration and starvation.



Class discussion and video 5 minutes

- 8 Introduce this class video: *Now we are going to learn about some possible impacts of climate change on our weather in the future. This is a 2050 weather forecast for Aotearoa, New Zealand which shows what a typical day's weather might look like in 2050.*

 **Weather forecast for 2050** (1:30 minutes, NIWA - National Institute of Water and Atmospheric Research).

Ask students about the video and check that they have picked up on some of the more subtle weather changes such as increases in temperature (small increases in the world's temperature can have a big effect on climate change):

What types of weather did you hear about in the weather forecast?

Answers: Sub-tropical low, flash flood, flooding, downpour, dry spell

What effects of this weather did you hear about in the weather forecast?

Answers: An outbreak of dengue fever (a viral infection spread by mosquitoes that like warm humid conditions and high rainfall); Tāmaki Drive flooded, so closed to all traffic; A fire ban in Canterbury, Waitaha and Otago because of a 53-day dry spell (any fire could potentially spread out of control).



Independent online learning 10 minutes

- 9 Students read about future weather predictions for Aotearoa, New Zealand and the possible implications (pages 7-8).
- 10 Students read about what could happen to some of our native species, including predators and pests (pages 9-11).

They are asked to match pictures of the following native species with their eggs: Tuatara, Little spotted kiwi (Kiwi pukupuku), Rockhopper penguin (Tawaki piki toka) and Archey's frog (Pepeketua).



Class discussion and pledge 10 minutes

11 Read page 12 out loud with students:

What can we do to help slow down global warming and reduce climate change?

Climate change is a challenge that we humans have created ourselves, but the good news is that we can definitely work together to fix it. Think about it - each of us might seem small on our own, but when we all join forces, we can make a huge difference. It's all about taking care of Papatūānuku, our Earth Mother and remember, every little action counts. When we all do our part, we're not just helping our local community, we're joining a global team of people working to protect the environment. Kia kaha, we've got this!

Discuss what students have learned today – this is an opportunity to help navigate any student climate anxiety by steering them towards positive actions or solutions being undertaken for example by:

- The school – make links to environmental sustainability initiatives in your school, for example the Enviroschools programme, composting or planting trees. Highlight other organisations that the school is working with e.g. Trees for Survival who planted more than 145,000 trees with students in 2023. Also make links to your school's involvement in Auckland Transport's Travelwise programme.
- The local community
- Auckland – for example Auckland Transport is changing the city's entire public transport bus fleet from diesel to low emission vehicles (electric and hydrogen) by 2040.
- Aotearoa, New Zealand or the world – like many countries around the world, Aotearoa has targets to reduce greenhouse gas emissions. The overall target is to be net zero by 2050 with a 50% reduction by 2030.

12 Ask students what they and their families are already doing to help reduce climate change (page 12).

Note: There are many ways in which we can all help. Although travel can have the biggest overall impact on climate change, not everyone can change the way they travel (especially families living in rural and off-grid locations), but they can help in other ways. See the below image for ideas.



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Possible answers: Use less electricity – turn the lights off when not needed • Use solar panels • Use less plastic (most plastic is made from fossil fuels) • Shop where you can use your own containers and reduce product packaging • Reduce food waste • Grow some fruit and vegetables • Compost • Recycle • Cycle or ride a scooter to school (if possible) • Carpool (if car travel is your only option) • Travel using public transport (if possible) • Walk short trips instead of being driven.

Ask students how they can personally make a difference and what pledge they would like to make – or perhaps a whole class pledge? Write the pledge/s down (with student's names) so that you can discuss the progress students are making in the next lessons.

- 13 Mention the next lesson (Lesson 3): *In the next lesson we'll learn **more** about our own impact on climate change and how we can all do something to make a positive difference to our planet's future.*



Class quiz and self-assessment 5 minutes

- 14 **Run the 6-question Kahoot! quiz** (you will need to log in to Kahoot!).

Quiz answers

1. Climate change is:

- a) Not important yet
- b) A problem that we can all help solve**
- c) Going to happen naturally
- d) Nothing to do with humans

2. Which animals are least likely to be affected by climate change?

- a) Animals that can fly
- b) Animals that rely on food from the sea
- c) Animals which thrive in many environments**
- d) Animals which have temperature-dependent eggs

3. Why is sea level rise a problem in the Pacific Ocean?

- a) Aotearoa, New Zealand will move south towards Antarctica
- b) The South Island will sink, and people will have to move to the North Island
- c) Low-lying islands such as Tuvalu are already sinking, destroying homes**
- d) Sea level rise will attract more sharks

4. Which of the following is **not an effect of climate change?**

- a) Loss of animal habitats
- b) Sea level rise
- c) Major weather events like fires and floods
- d) The nights becoming longer in winter**

5. Which species are least likely to face the risk of extinction?

- a) Tuatara
- b) Rats**
- c) Rockhopper penguins (Tawaki piki toka)
- d) Little spotted kiwi (Kiwi pukupuku)

6. What is happening to polar ice because of climate change?

- a) It is melting and causing sea levels to rise**
- b) The amount in the Arctic Circle is increasing
- c) New Zealand beaches are rising higher above sea level
- d) More ice is forming in Antarctica because it is getting colder there

- 15** Students use the tick boxes to indicate if they think they have achieved the success criteria or not (page 14).



Extra activities

If students finish early, they have the option to complete one of the following activities (page 14):

E1. Play **Crunch Time** (Genesis School-Gen) – a multi-level quiz game with points where students are asked several fun questions about energy and the environment.

E2. Explore the **NASA Climate Kids** website.

E3. Explore the **importance of climate change to Māori**.