



Teacher Resource

Zero Emissions

Focus Questions

Discuss the BTN story as a class and record the main points of the discussion. Students will then respond to the following:

1. What did the Zero Emissions story explain?
2. What year do many countries want to reach net-zero carbon emissions by?
3. What are fossil fuels? Give one example.
4. What is it called when the sun's heat gets trapped in the Earth's atmosphere?
5. What does it mean to be net zero or carbon neutral?
6. What is a greener alternative to petrol cars?
7. What gas do trees absorb?
8. Name one country that has committed to net zero carbon emissions by 2050.
9. Why has Australia been criticised by other countries about its commitment to becoming carbon neutral?
10. What did you learn watching this story?

Activity: Class Discussion

After watching the BTN Zero Emissions story students will reflect on the story and then respond to the following:

- What do you THINK about what you saw in the BTN story?
- What does it mean to have net zero emissions?
- What are some ways that we can achieve net zero carbon emissions by 2050?
- Think of three questions you have about the BTN story.
- What are the positives and challenges of trying to reach zero emissions?
Create a T-chart.

Positives	Challenges

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KEY LEARNING

Students will investigate ways to reduce carbon emissions at home, school and in the community.

CURRICULUM

Geography – Year 4

The use and management of natural resources and waste, and the different views on how to do this sustainably.

HASS – Year 4

Reflect on learning to propose actions in response to an issue or challenge and consider possible effects of proposed actions.

HASS – Year 5 & 6

Reflect on learning to propose personal and/or collective action in response to an issue or challenge and predict the probable effects.

HASS – Year 7

Reflect on learning to propose personal and/or collective action in response to an issue or challenge, taking into account different perspectives, and describe the expected effects.

Science – Year 4

Science knowledge helps people to understand the effect of their actions.

Science – Years 5 & 6

Scientific knowledge is used to solve problems and inform personal and community decisions.

Activity: Vocabulary

Students will brainstorm a list of keywords that relate to the BTN Zero Emissions story. Here are some words to get them started. Students will create their own class glossary of keywords and terms. Students can use illustrations and diagrams to help explain each keyword.

CARBON EMISSIONS	FOSSIL FUELS	RENEWABLE ENERGY
ATMOSPHERE	CLIMATE CHANGE	FOOTPRINT
GLOBAL WARMING	SUSTAINABILITY	GREENHOUSE GAS

Further investigation: Tricky Words

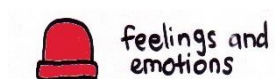
Students will choose additional keywords and terms to add to their class glossary that are tricky. For example, carbon offsetting, CFCs, emission trading scheme, Kyoto Protocol or greenhouse effect. Students will find a definition and explain to their classmates what the keywords mean.

Activity: Six Hat Thinking

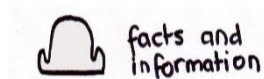
As a class, use Edward De Bono's Six Hat Thinking to explore the issues raised in the BTN Zero Emissions story. Make your own coloured hat cut-outs and place on the floor. Students will take it in turns answering questions in relation to what they already know about the issue, what they have learned from the story and what they want to learn further about the topic.

Reflection

After this activity, ask students to reflect on what they have learnt. Students can include details about how their thinking on this issue has changed.



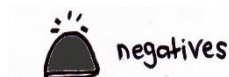
How did the *Zero Emissions* story make you feel?



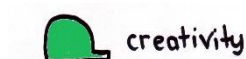
What do you know about the topic?
What have you learnt from the story?



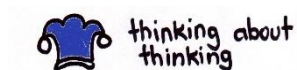
Were there any positives from the story? If so, what were they?



What are some of the negatives or challenges that you learnt from the story?



Why is it important to find out more about the topic?



What questions were raised during this activity?
What do you want to learn further about this topic?

Activity: KWLH

Hold a class discussion about the information raised in the BTN Zero Emissions story. What questions were raised in the discussion and what are the gaps in their knowledge? The following KWLH organiser provides students with a framework to explore their knowledge on this topic and consider what they would like to know and learn.

<i>What do I <u>k</u>now?</i>	<i>What do I <u>w</u>ant to know?</i>	<i>What have I <u>l</u>earnt?</i>	<i><u>H</u>ow will I find out?</i>

Research questions for Inquiry

Students will start to think like a scientist and develop their own question/s for inquiry, collecting and recording information from a wide variety of sources. Students may develop their own question for inquiry or select one or more of the questions below.

- What is carbon offsetting? Find a real life example of a company that is carbon offsetting and explain what they have committed to, to reduce their carbon footprint.
- What is the difference between weather and climate? Use meteorological terms in your explanation.
- What is currently being done to reduce our carbon footprint? Think about how your family, school, businesses and the government are trying to reduce their carbon footprint. Give examples.
- What is the difference between the Kyoto Protocol, the Paris Agreement and the Geneva Convention? How is Australia committing to these agreements?
- How can a city reach net zero carbon emissions? Design a sustainable community (think about transport, renewable energies, being water smart, recycling programs, growing food locally, changing habits) to represent your findings.
- What does climate change look like? Use images to show the impact of climate change in Australia. For example, bleaching of coral reefs in the Great Barrier Reef, dry lightning storms in Tasmanian World Heritage Forests or rising sea levels flooding mangroves.

Activity: Take action

Ask your students 'What can we do and why is it important to get involved in tackling climate change?' Facilitate a brainstorming session and record students' responses on a mind map. Individually or in pairs, students will explore ways their school and home can reduce their carbon emissions and become more environmentally sustainable.

Students can undertake one or more of the following activities:

- School energy audit – track your school's energy usage and calculate your carbon emissions. How can your school reduce its carbon emissions? For example, turn off lights when not in use, turn off

computers at the end of the day, find alternatives to driving to school, buy locally sourced seasonal food and reduce your waste. Share your results with the school community.

- Does your school have solar panels? If not, conduct a study and present it to your school. Research the benefits of using solar energy at your school. Does your school have a plan to reduce its carbon footprint? If so, find out what your school's targets are in reducing its carbon emissions. Would installing solar panels reduce your school's carbon emissions? Explain.
- Write letters to local or federal politicians expressing your school's views on greenhouse gas emissions and its impact on communities, plants and animals in your local area.
- Contribute a class article to the school newsletter sharing your research.
- Invite a scientist to visit your school to talk about the difference between weather and climate.
- Contact your local council and/or other schools in the area to find out how they are reducing their carbon footprint. Share ideas on how your community can reduce their greenhouse gas emissions.
- Design a special lesson to teach other kids at your school about why it's important for people to take action against global emissions.
- Propose some goals (short-term and long-term) that your school could set to try and reduce their carbon footprint. Include a pact or plan of action in your proposal.

Activity: What is the Greenhouse Effect?

Working in pairs or small groups, ask students to discuss their understanding of the greenhouse effect. Use the following questions to guide discussion.

- What is the greenhouse effect?
- Why is it called the greenhouse effect?
- How is the earth a greenhouse? What are the similarities between earth's atmosphere and a greenhouse that you would find in a garden?

In their pairs or groups, students will create a diagram/illustration to explain the greenhouse effect, including the following elements in their image: sun, earth, atmosphere, ozone layer and greenhouse gases.

What are the Consequences?

Ask the class to consider a range of consequences for not reducing greenhouse gas emissions. Rate the consequences on a scale of 1 to 10, where 1 is a low impact and 10 is severe impact.

Have students give their opinion on the likelihood of each consequence. Below are some suggested consequences:

- Rising temperatures
- Ice will melt
- Sea levels will rise
- Plants and animals at risk
- How are our natural ecosystems affected by climate change? (e.g., the Great Barrier Reef ecosystem)
- Health will be affected
- Extreme weather (heat waves, flooding, bushfires, drought)

Activity: What is climate change?

The following video explains what climate change is and the impact rising temperatures could have. Watch the [Newsround video](#) and answer the following questions:

- Pollution that causes climate change comes from what?
- Why is 2 degrees an important number?
- What are some of the effects of climate change?
- What can be done to reduce the impact of climate change?



Activity: BTN stories

Watch one of the following BTN stories to learn about hands-on projects that kids around Australia are working on at home, in the classroom and in the community to help the environment and reduce their carbon footprint. After watching any one of the BTN videos ask students to respond to the discussion questions (to find the teacher resources go to the related BTN Classroom Episode and download the Episode Package).



[Climate Change Court Battle](#)



[School Recycling Campaign](#)



[Clean Up Australia](#)



[Recycling Solution](#)



[Bush Tucker Garden](#)



[Aquaponics School](#)



[Electric Car Class](#)



[Endangered Seeds](#)



[War on Waste School](#)

Activity: Quiz

1. What is the international treaty on climate change?

- A. Paris Agreement
- B. Kyoto Protocol
- C. Geneva Convention

2. Which of these is a greenhouse gas?

- A. Carbon dioxide
- B. Methane
- C. Nitrous oxide
- D. All of the above

3. What is the chemical formula for carbon dioxide?

- A. CO₂
- B. C₂O
- C. O₂

4. The Earth's atmosphere is made up mostly of oxygen.

- A. True
- B. False

5. What is NOT a fossil fuel?

- A. Coal
- B. Natural gas
- C. Wood

6. What does CFC stand for?

- A. Carbon fluoro compound
- B. Chloro fluoro carbon
- C. Carbon fuel cycle

7. What produces the MOST greenhouse gas emissions?

- A. Electricity
- B. Manufacturing
- C. Transportation

8. What is it called when there is a balance between emitting carbon and absorbing carbon from the atmosphere?

- A. Global warming
- B. Greenhouse effect
- C. Net zero emissions

9. What gas do trees absorb?

- A. Methane
- B. Carbon dioxide
- C. Oxygen

10. Which country has NOT yet committed to net-zero emissions by 2050?

- A. Australia
- B. Sweden
- C. United Kingdom

Quiz Answers: 1A, 2D, 3A, 4B, 5C, 6B, 7A, 8C, 9B, 10A.

Useful Websites

- [Understanding Climate Change](#) – BTN
- [Climate change: What is it and why is everyone talking about it?](#) – Newsround
- [Choose your climate future](#) – WWF
- [Net Zero Coalition](#) – United Nations
- [‘No blank cheque’ on net zero carbon emissions target, PM says, as global ‘code red’ issued](#) – ABC News
- [Climate](#) – WWF