

Name:

Grade:

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Date:

WithOnePlanet

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Introduce

Lesson 1

Student worksheet

How are we changing our planet?

Years 9 to 10



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INQuIRY



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WithOnePlanet

Climate change education
An xpend Foundation initiative

How are we changing our planet?

Lesson 1: – Student worksheets

Activity 1: What is climate change?

Watch the following video series on climate change, and answer the questions below.



What is climate change? Australian Government Great Barrier Reef Marine Park Authority
<<https://youtu.be/ko6GNA58YOA>>



Q1: What is climate generally understood to mean?

Q2: How do we measure climate?

Q3: What does climate change refer to?

Q4: What do most experts agree is the main cause of climate change?

Q5: How did the experts reach this conclusion?

Source:

Australian Government Great Barrier Reef Marine Park Authority, 2008, *What is climate change?*, [Online Video] 2 March 2008, viewed 13 January 2016, <<https://youtu.be/ko6GNA58YOA>>



Is Earth Warming? *Climate Change, Lines of Evidence: Chapter 2*

<https://youtu.be/-luVzcp39rs>



Q1: Is the information collected by scientists about Earth's temperature reliable? Why/why not?

Q2: How much has Earth's average surface temperature increased over the past 100 years?
When did the biggest change occur?

Q3: What is the estimated global temperature difference between the climate of today and the climate of an ice age?

Q4: In addition to surface temperature, what other parts of the climate system do scientists measure carefully?

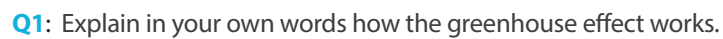
Q5: What has the use of satellites meant for the collection of data?

Q6: What other indicators of global warming have been observed?

Source:

The National Academies of Sciences, Engineering, and Medicine, 2012, *Is earth warming?* Climate Change, Lines of Evidence: Chapter 2 [Online Video] 2 July 2012, viewed 13 January 2016, <<https://youtu.be/-luVzcp39rs>>

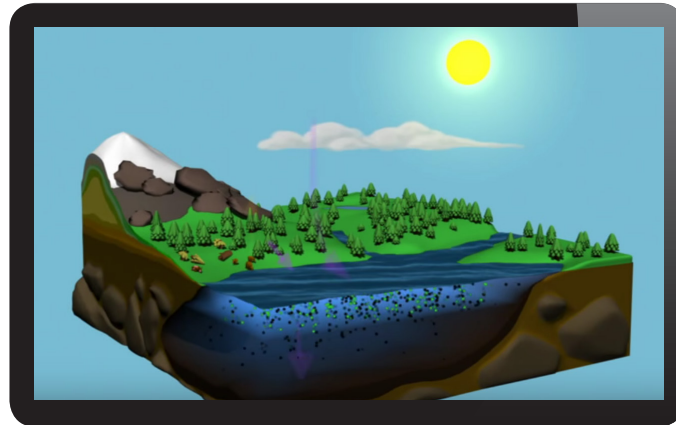
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The National Academies of Sciences, Engineering, and Medicine, 2012, *Greenhouse Gases: Climate Change, Lines of Evidence: Chapter 3* [Online Video] 2 July 2012, viewed 13 January 2016, <<https://youtu.be/3JX-ioSmNW8>>



Increased Emissions: *Climate Change, Lines of Evidence: Chapter 4*
<https://youtu.be/nlu21CNd34Q>



Q1: Why is establishing the human influence of greenhouse gas concentrations challenging?

Q2: What human activity released additional CO₂ into the atmosphere? How do we know this was from human activity?

Q3: How have scientists measured CO₂ concentrations from the past, prior to modern measurements?

Q4: What do these data show?

Q5: What percentage of CO₂ emissions from human activity remains in the atmosphere?

Source:

The National Academies of Sciences, Engineering, and Medicine, 2012, *Increased Admissions: Climate Change, Lines of Evidence: Chapter 4* [Online Video] 2 July 2012, viewed 13 January 2016, <<https://youtu.be/nlu21Cnd34Q>>



How Much Warming? *Climate Change, Lines of Evidence: Chapter 5*
<https://youtu.be/hVvzVs1AKGY>



Q1: What are 'forcing agents'?

Q2: What is the most significant forcing agent, and why?

Q3: What are some of the other ways that human activities are influencing Earth's climate?

Q4: What percentage of CO₂ emitted to Earth's atmosphere is a result of deforestation?

Q5: What causes cooling of Earth's temperature?

Q6: What is the net result of the warming and cooling of Earth's temperature?

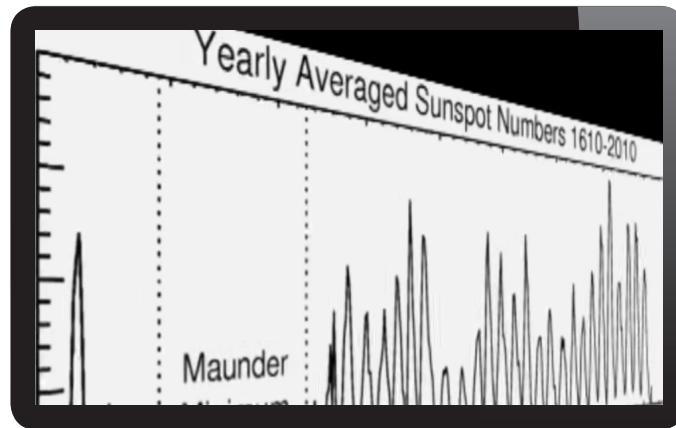
Q7: What is 'positive feedback'? Give an example.

Source:

The National Academies of Sciences, Engineering, and Medicine, 2012, *How Much Warming? Climate Change, Lines of Evidence: Chapter 5* [Online Video] 2 July 2012, viewed 13 January 2016, <<https://youtu.be/hVvzVs1AKGY>>



Solar Influence: *Climate Change, Lines of Evidence: Chapter 6*
<https://youtu.be/0V2HYZbFLn8>



Q1: Could the sun be responsible for global warming? Why/why not?

Source:

The National Academies of Sciences, Engineering, and Medicine, 2012, *Solar influence: Climate Change, Lines of Evidence: Chapter 6* [Online Video] 2 July 2012, viewed 13 January 2016, <<https://youtu.be/0V2HYZbFLn8>>

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[illegible]

The National Academies of Sciences, Engineering, and Medicine, 2012, *Natural Cycles: Climate Change, Lines of Evidence: Chapter 7* [Online Video] 2 July 2012, viewed 13 January 2016, <https://youtu.be/2_10jtPCjQw>

Activity 2: Not the usual suspects

When we think about climate change and pollution, we generally think about things like cars and planes as the big polluters. There is, however, another big way that we are putting carbon into the environment. Look at the following video and website and answer the following questions.



Watch the video to find out about a social enterprise called WithOneSeed
<https://vimeo.com/46006917>



Q1: What are the main benefits of initiatives like WithOneSeed? **Q1:** Now go to the website: www.atag.org/facts-and-figures and answer the following questions.

Q1: How many tonnes of CO₂ did the aviation industry produce in 2013?

Q2: What percentage of human-induced CO₂ emissions is this?

Q3: What can you assume that means about the amount and percentage of carbon emissions from technology use?

Q4: Where do you think your data goes on the internet? (photos, emails, sms, Facebook posts, etc)

Q5: Do you think this has an effect on the environment?

Read the following article and discuss this with your class.

<http://www.greeniacs.com/GreeniacsArticles/Environmental-News/Internet-Carbon-Footprint.html>

Sources:

WithOneSeed, 2014, *Just What is WithOneSeed all about?* [Online video], viewed 4 February 2016, <<https://vimeo.com/46006917>>

ATAG: Air Transport Action Group, 2014, *Facts and Figures*, [Website], April 2014, viewed 4 February 2016 <<http://www.atag.org/facts-and-figures>>

Greeniacs, 2012, William Klein, Internet Carbon Footprint, Posted 29 May 2012, viewed 4 February 2016 <<http://www.greeniacs.com/GreeniacsArticles/Environmental-News/Internet-Carbon-Footprint.html>>