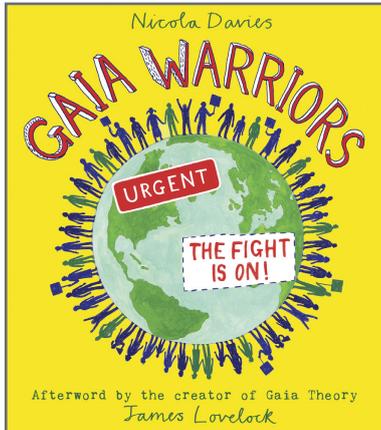




Individual Title Activities



GAIA WARRIORS

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215 x 190mm

192 pages

11 years +

Introduction

The aim of *Gaia Warriors* is to provide children from 11 to 16 with information about climate change – and the actions being taken to combat it – in an accessible form. It is not, however, a conventional information book. It approaches the science of climate change by posing questions that “climate change sceptics” might ask, and presents scientific evidence to answer each question in turn. It also gives scientists the opportunity to speak for themselves, through interviews conducted by the author with climate scientists working on various aspects of climate change across the globe.

Extensive use is made of interviews throughout the book, but especially in the second half, where solutions to the various challenges presented by climate change are shown “first-hand”, explained and discussed by the people shaping them.

Gaia Warriors can be used as a resource for teaching in several areas of the Key Stage 3 and 4 curriculum. Ideas for use in Geography, Science and English are included here but the book can also be used as a resource for aspects of Personal, learning and thinking skills (PLTS) and Citizenship.



Geography

Key Concepts: Place and Space

How do we visualize our planet? How do we visualize what our own or another country is like? When you point to a part of the globe, what would you expect to find there? Ice at the poles? Forest in the Amazon Basin? Wheat growing across the American Midwest?

Discussion

A snapshot of the world

Starting with a globe and the students' existing knowledge, compile a snapshot of Earth – major climatic regions, important habitats, famous cities such as New York, London and Venice, location of "charismatic megafauna", e.g. tigers in India, giraffes in Africa, whales in the oceans. Allow students to put all they know into this snapshot, including cultural information and their own travel experiences and desires ... everything from "It always rains when we go camping in Cornwall", to "Shopping in New York would be so cool" and "I want to go to the Maldives and lie on a beach all day."

This exercise can be done in ten minutes just by writing down on a white-board a list of ideas and impressions, or it can take much longer, giving students the chance to research their input, perhaps finding images from magazines and the internet to support their "snapshot".

The aim is to make the point that our world, as we understand it, depends on climatic stability.

Investigation

Changing climate, changing world

How might climate change alter this snapshot? Has it started to alter our world already?

Read from *Gaia Warriors*, "If It's Only a Few Degrees, What Difference Will It Make?" on p61–65 and the "Living With a Changed Climate" interviews with people living in the Maldives and the Arctic on p29–33.

Research scientific projections of how climate will change with an increase in global temperatures. The Met Office website has good animations and information showing how various parameters will change:
<http://www.metoffice.gov.uk/climatechange/science/projections/>

Explore the four degree hotter world on Google Earth.

Read "No Rainforest, No Monsoon", *New Scientist*, 30 Sep 2009 and "How to Survive the Coming Century", *New Scientist*, 25 Feb 09:

<http://www.newscientist.com/article/dn17864-no-rainforest-no-monsoon-get-ready-for-a-warmer-world.html>

<http://www.twine.com/item/121pb5nqw-7b/how-to-survive-the-coming-century-environment-25-february-2009-new-scientist>

Synthesis and Discussion

A new kind of snapshot

Now revisit the snapshot of the Earth and discuss how those changes in climate might alter it. What might a snapshot of the world look like in 20, 50 or 100 years?

What might human populations do in response to this changed vision of the Earth?



Key concepts: Scale and interdependence and Environmental interaction and sustainable development

Understanding the causes of climate change, its impact on ecosystems and on humanity and the steps we can take to mitigate that impact, encompasses all these key concepts.

Scale and Interdependence

Discussion

Me and the atmosphere

How do we all as individuals, have an effect on the atmosphere? (There will be the usual obvious flatulence jokes here ... but you can use that to talk about methane and global warming.) One way to do this is to take students through their "typical day" and look at the direct and indirect emissions resulting from their behaviour. Did they get the bus to school or get a lift in the car? Did they have the heating turned up in their bedroom? Cereal for breakfast or a bacon butty? New jeans or trainers? The aim here is, obviously, not to play "I'm greener than you" but to make the point that everything we do uses energy and anything that uses energy has an effect on the atmosphere.

Investigation

Adding it up

How do you measure exactly what your greenhouse gas emissions are? There are now many sites online that allow you to feed in data about your lifestyle and get an estimation of your carbon footprint. But how does that fit with what's going on in the rest of the world?

In *Gaia Warriors*, read "It's All Too Big and Scary And There's Nothing I Can Do About It" and the "Making Sense of Carbon" interview with Antony Turner on p75–81. Also take a look at the CarbonSense website. Use the websites listed on p79 (or others of your choice) to allow students to investigate their own carbon footprints.

How do individual carbon footprints fit into the bigger picture? In *Gaia Warriors*, read "Is Climate Change Our Fault?" on p53–59, paying special attention to comparing carbon emissions around the world on p58–9.

Discussion and investigation

Whose fault and whose responsibility?

Is climate change the fault of industrialized nations? And, if so, should they have to cut their emissions and let the developing world increase theirs? Or should everyone have to cut? Is it true that arguing about this is like quarrelling over who should bale out a sinking ship?

Allow students to investigate further. If they find it hard to form an opinion, look at the climate change witness statements on the WWF website:

http://www.panda.org/about_our_earth/aboutcc/problems/people_at_risk/personal_stories/

Also read in *Gaia Warriors* the "Living With a Changed Climate" interviews with people living in the Maldives and the Arctic on p 29–33 and read "Lawyers for The Earth" on p153–159.



Role play

Taking sides

Divide the class into three groups. One group, the Industrialists, will represent greenhouse gas-producing industries, like energy companies and car manufacturers. The other group, the Victims, will represent a group of people – Inuit, Saami, Maldivian islanders etc. – who are suffering from the impact of climate change. The final group, the Public, represents the ordinary people living in the countries where the industries operate.

Step 1

Each group works together to put forward arguments and evidence to support its position.

The Victims want the Industrialists to take responsibility for climate change. They want them to pay the Victims compensation for the damage climate change has done to their lives. (Students may have to do some further research to find out exactly what the Victims would ask for, but there are plenty of clues in the material they have read and looked at so far.)

The Industrialists want to keep making money, and avoid having to take any financial responsibility for their emissions.

The Public want ... what? To keep having cheap energy and polluting cars? To switch to clean energy and fewer, smaller cars? To take care of their own interests? To be fair to everyone? The Public must decide what it is they want most.

Step 2

Debate...

The Public announce what it is they want most.

The Industrialists and Victims present their arguments.

...and Discussion

How does what the Public wants influence the outcome of the argument between Industrialists and Victims?

Might the Public change what they want? What might influence that?

Is there an outcome where everyone wins? And one where everyone loses?



Environmental interaction and sustainable development

1. Investigation and discussion

Taking Action

Divide the class into groups and assign each group with the task of reducing the carbon impact of one aspect of ordinary life. They can begin their investigations by reading the relevant section in *Gaia Warriors*.

Food: read "Rock-Star Food" on p124–129.

Clothing: read "Dressing for the Climate" on p136–141.

Housing: read "Homes for Climate Heroes" on p130–135.

Transport: read "Driving Mad" on p112–117.

Holidays: read "Plane Foolish" on p118–129.

Energy: read "Bad Habits" on p98–103.

2. Investigation and discussion

The bigger picture

Whose fault? Whose responsibility?

Ask the whole class to read "Who's The Climate Change Baddie?" on p57–59.

Then divide the class into three groups, each group to read one of the following sections about big scale solutions to climate change. Within their groups students should discuss these from their reading (and possibly further research). Groups then get together to see how the big scale solutions can be joined up to strengthen overall action.

Group 1: read "Keeping Gaia Green" on p142–149.

Group 2: read "Lawyers for the Earth" on p153–159.

Group 3: read "Seeing the Future" on p174–179.



Science

Key concepts: Scientific thinking, Application and implications of science, Cultural Understanding and Collaboration

The entire first section of *Gaia Warriors* is devoted to explaining the science behind climate change, step by step, in an easily accessible way. It includes several examples of the first-hand research experience of climate scientists. The science of climate change, with its use of complex computer models and its history of international collaboration in the form of the Intergovernmental Panel on Climate change (IPCC), illustrates every aspect of the Key Stage 3 curriculum – Scientific thinking, Applications and implications of science, Cultural understanding and Collaboration. So, *Gaia Warriors* combined with exploration of websites such as the Met Office, Hadley Centre and even the IPCC's own site, could be used to help to convey all aspects of Key Stage 3 Science. However, the following outlines offer examples of specific key concept links in the text.

Scientific thinking and Application and implications of science

1. Investigation and discussion

What do we need to measure?

One of the most important aspects of climate science is the use of computer models to forecast what the climate will be like in the future. The accuracy of these models depends on the best information possible on how the climate works now and how it worked in the past.

Read "What's Causing Climate Change?" on p35–37 then discuss what you might need to measure to get an accurate picture of how climate works.

For examples of scientists finding ways to measure some of those things, read the interviews under "Earth Watching?" on p20–23, "Air Monitor" on p38–41, and "Measuring the Climate of The Past" on p47–51.

Are there aspects of how climate works that might be very hard to measure or predict? Read "Nasty Shocks and Tipping Points" on p66–69.

2. Investigation

Making Models

Use the following resources to find out how climate models are made, what they do and how accurate they might or might not be.

Read "Is Climate Change Our Fault?" on p53–59.

Look at Met Office website for information on how models work and what they predict:
<http://www.metoffice.gov.uk/climatechange/science/projections/>

Look at this article to find some of the potential problems with climate models:
<http://www.scientificamerican.com/article.cfm?id=new-climate-mode>



3. Investigation

How is climate science used to shape our world?

Use this section of the book to find out what the IPCC is, what it does, and why it's important.

Read "Big Science" on p166 (interview with IPCC scientist and joint Nobel Prize Winner, Beth Holland) and "A Short History of Treaties and Deals" on p170–173.

4. Discussion

So, what shall we do?

Climate change models aren't perfect and we can't be absolutely sure what will happen. So, do we wait and see, or take BIG action now?

Read "What If The Scientists Have Got It Wrong, and We Waste Money Preparing For Something That Never Happens?" on p71–73 to help you decide. Also look at the YouTube link listed on p73.

Cultural Understanding and Collaboration

1. Investigation and Discussion

What's the evidence for Climate Change?

What evidence do we have from observations of the world as it is today, and how it was in the past, for climate change?

Divide the class into four groups; each one reads a different section of the book to find information to help them answer this question. (Obviously this can be done as a much bigger exercise, offering students the opportunity to use the book as a springboard for their own investigations.)

Group 1: read "How Do We Know Climate Is Changing" on p25–28.

Group 2: read the "Living in A Changed Climate" interviews on p29–33.

Group 3: read "But Hasn't Climate Always Changed?" on p43–46.

Group 4: read "If It's Only A Few Degrees, What Difference Can It Make?" on p61–65.

Groups discuss together what they have discovered.



2. Investigation

Describing the problem

How is all the evidence from scientists around the world used to show what is happening and what might happen in the future to the Earth's climate?

Read "Big Science" on p166 (interview with IPCC scientist and joint Nobel Prize winner, Beth Holland) and "A Short History of Treaties and Deals" on p170–173.

Look at the Met Office Hadley Centre web site to see computer models of future climate in action:

<http://www.metoffice.gov.uk/climatechange/science/projections/>

3. Investigation and discussion

Solutions

Divide the class into groups to investigate what science can contribute to finding solutions to specific problems. Use sections of *Gaia Warriors* (and the websites listed in them) as a springboard for the students' own research into new technologies and ideas that might help.

Group 1 – Low Carbon Energy: read "Keeping Switched On" on p104–111.

Group 2 – Transport: read "Driving Mad" on p112–117 and also "Plane Foolish" on p118–123.

Group 3 – Housing: read "Homes for Climate Heroes" on p130–135.

4. Investigation and Discussion

What are we aiming for?

If all the solutions that students found in the previous section were implemented, what would the world look like? What would be different? This could be a whole project in itself looking at positive applications of science and technology to create a better world, and could involve cross-curricular activities such as creative writing, artwork, sculpture, technical model making, IT and even music!

Read "Seeing the Future" on p174–179 to help you come up with your vision of the low carbon world.



English

Gaia Warriors is not a conventional “information book”. It was written to be read as a series of narratives. It packages information in a chatty, readable style that offers a model of non-fiction writing for young readers and writers. It also makes extensive use of interviews and quotations from other texts and sources, offering readers examples of how to handle a variety of inputs in their own writing. It makes many cross-curricular links – with Science, Geography, PLTS and Citizenship.

Here are just a few ideas of the ways in which specific aspects of the book might be used to help deliver features of the Key Stage 3 English curriculum.

Reading and writing that develops cross-curricular links.

Read one or more of the chapters in Section One of the book that explains the science behind climate change in a question and answer form. Now explain what you’ve learned to a friend. Think about how you might communicate that information to someone even younger than yourself, and rewrite what you have read for a much younger reader.

Write for contexts and purposes that extend beyond the classroom.

Play with language and explore different ways of shaping students’ own meanings.

Read one of the chapters in Section Two about how we can make changes to our everyday lives to help fight climate change; for example, read about campaigning and changing people’s minds on p88, or about food on p124, clothes on p136 or transport on p112.

Each chapter consists of an interview with a person putting changes into action and some tips for what the rest of us can do. Choose one chapter and come up with some snappy slogans to deliver its message. Try different kinds of slogans for different audiences.

Taking on different roles and meanings

Read one of the many interviews in *Gaia Warriors*, for example: “Measuring the Past” on p47, “Driving Mad” on p112, “Dressing for the Climate” on p136 and “Lawyers for the Earth” on p153.

Then make notes in response to the following questions:

1. What information did the interview convey?
2. Where did you find that information – in the direct quotation of the interviewee’s words, in the author’s text, or in both?
3. What sort of person do you think the interviewee is? Which parts of the text helped you form your opinion?

Now, try conducting your own interview. Think of someone you know with a particular interest or hobby – knitting, bungee jumping, wakeboarding, whatever – and interview them about it. Remember the job of an interview like this is to tell your readers about the subject (wake boarding, knitting etc.) *and* give an impression of the personality of the interviewee.



English

Tips for interviewing technique

1. If it's someone you know, keep it quite formal. Remember that you are being a professional writer. So book a specific place and time, somewhere quiet where you won't be disturbed, to do your interview. Make sure you do some research into the subject (*know* about knitting etc.) before you do the interview.
2. Make notes, but don't let that stop you listening to what your interviewee says.
3. Write a first draft of the interview as soon as you can, even if you know you need to do more research. It will help you see what you need to find out.
4. Do a second follow-up interview if you can, to fill in any gaps.