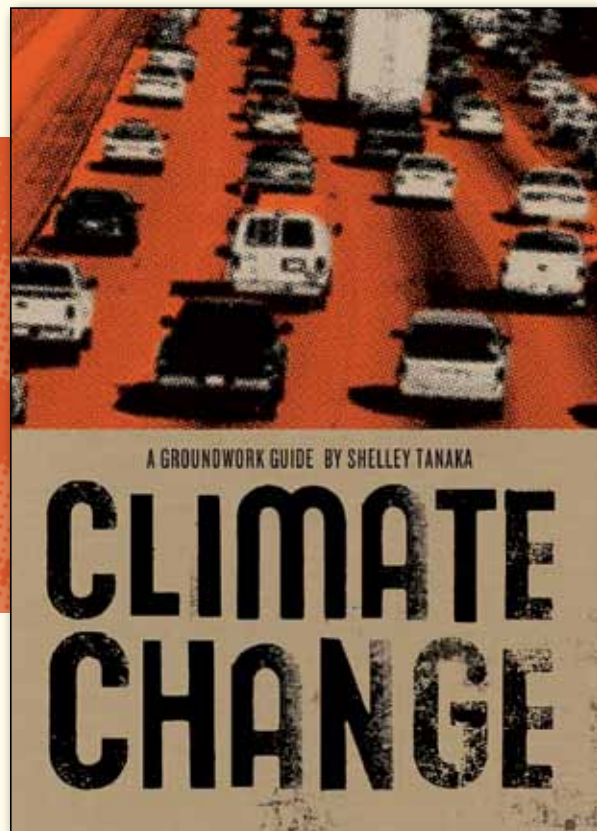


CLIMATE CHANGE

A GROUNDWORK GUIDE

Written by Shelley Tanaka



ABOUT THE BOOK

This book is about the global climate change crisis. The book examines the following topics:

- the evidence showing that climate change is real
- the science behind the causes of climate change
- the effects of climate change
- the political, social and economic factors in facing climate change
- what we can do about climate change

CURRICULUM CONNECTIONS

- Social Studies (Civics, Geography, History, World Studies)
- Humanities and Social Sciences
- English Language Arts
- Business Studies (Economics)
- Arts (Visual Arts, Theater Arts)
- Information and Communications Technology

IDEAS FOR GETTING STARTED

- Introduce the book and your goals for studying it, and briefly outline the issues the book explores. Tell students that issues-based study raises varied opinions, and that, as a class, you will set some ground rules for maintaining a respectful and safe classroom atmosphere for discussing personal views and beliefs. Ask the class to collaborate to create a list of expectations, such as “We’ll respect one another’s privacy,” “We’ll listen to one another” and “We won’t insult one another.” Post the list and revisit it periodically to allow students to make observations and air problems.
- Use Getting Started: *Climate Change* Quiz (included in this Teachers’ Guide). Have students take the quiz in groups, with a quizmaster for each group. After the quiz, have a class discussion about what students want to learn from this study and what their biggest concerns about climate change are. After your study of the book, they can reflect on these earlier discussions. The answers are
 1. F. There will be more precipitation, but shifting wind patterns may carry clouds long distances before they dump their water vapor.
 2. F. It is odorless and occurs naturally in the atmosphere.
 3. T. But those that do occur could be more intense.
 4. c) wind
 5. a) 97%
 6. F. It’s a very *thin* layer.
 7. F. Young forests, especially tropical forests.
 8. T. And the Himalayan glaciers could be gone.
 9. T. But changes to vegetation belts can cause other problems.
 10. F. Eight times as much.
- Conduct a “human graph” activity to reflect students’ current opinions on climate change. In a large, open area, like the gym, post a series of signs on one wall, about 1.5 meters (5 feet) apart, saying, “I strongly agree,” “I agree somewhat” and “I do not agree” (or whatever measurement indicators you choose). You read a series of statements, and the students line up in front of the sign that indicates their opinion, forming a human bar graph. Here are some sample statements: *I can’t do much about climate change. Climate change is the biggest threat we face in the twenty-first century. The worry about climate change is overblown.* You could change the indicators to “Always,” “Sometimes” and “Never” to measure students’ environmental practices, such as using waste-free lunches, turning off lights and computers, not idling the car, and so on.

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TEACHING/LEARNING APPROACHES

- Read the book as a class with group or class discussions at the end of each chapter and a culminating activity at the end. You could use a combination of teacher read aloud, guided reading and independent reading.
- Have students read the book independently and create their own independent study project.
- Assign groups of students one chapter each and have them read it and present it to the rest of the class.
- Have students read the book in groups and then either collaborate on a culminating activity or complete one independently.
- Ask students to keep an Issues Journal (in writing or on audio or video) in which they comment on what they have read and/or discussed. Encourage frequent updates throughout the study of *Climate Change*. Let students know from the outset whether the journal is for personal use only or if it's meant to be part of their assessment.

IDEAS FOR DISCUSSION

- How worried are you about climate change? How does reading this book affect your thinking about it?
- Some people believe that changes in climate are a natural occurrence and some refute claims that it is a crisis. What do you think?
- What is a carbon sink?
- If climate change caused a wave of migration to your country, what do you think your government's migration policy should be?
- Why are some corporations changing their systems to address climate change? Why are some corporations resisting?
- The author of *Climate Change* writes, "Western culture, rapidly spreading throughout the globe, is based on acquiring stuff, and success is judged by whether one has more or better stuff than others" (p. 82). What do you think of this statement? How does it relate to the topic of climate change?
- Do rich nations have a right to tell developing countries not to cut down their forests?
- Reread the sidebar about Tuvalu on page 70. What do you think: Should Tuvalu be given compensation? What about developing countries with low greenhouse gas emissions? Should they be compensated in some way?
- What developments and actions make you the most hopeful about facing climate change? What worries you the most about climate change?

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- Most people now know what they can do as individuals to help address climate change. But how can everyone be urged to do it? How do people get their governments to take action? How can the feeling that it's too big an issue for individual action be addressed?
- What do you think about the last paragraph in *Climate Change*? How did you feel when you read it?

IDEAS FOR ACTIVITIES

- Students arrange for a guest speaker for the class or school, such as an environmental studies or science professor, a teacher from an outdoor education center, a member of a school's environment club or a member of an environment organization. Students organize, advertise and host the event.

Subjects: Geography, Science, World Studies, Humanities and Social Sciences, English Language Arts

- Students choose five or six facts from the book that affected or resonated with them the most and jot them down. They discuss their choices in groups and explain the reasons for their choices.

Subjects: Geography, Science, World Studies, Humanities and Social Sciences, English Language Arts, Health/Career and Life Management

- Students survey current advertising for cars and trucks on television, the Internet, billboards, and in print media to see what is emphasized in the ads. They could create a tool, such as an observation checklist to gather their data. They can then share and discuss their observations and opinions in groups. Students might then research the fuel efficiency and amount of carbon dioxide released for different types of vehicles.

Subjects: English Language Arts, Geography, Science, World Studies, Humanities and Social Sciences

- Students choose an ecological or geographical process or system they read about in the book and create a detailed graphic to explain it. For example, they could create a flow chart of the carbon cycle or the hydrologic cycle, or a diagram of thermohaline circulation, the greenhouse effect, the effects of carbon dioxide on climate or what happens when glaciers melt. They can decide on their audience; for example, they might want to explain the process to a class of younger students, or a group of parents.

Subjects: Geography, Science, World Studies, English Language Arts

- Students work in groups and represent data from the book and other sources in a series of graphs and tables, using graphic software. They decide on the purpose and theme of their data representations and create a way to display/present them. They can present their work to a group or another class.

Subjects: Mathematics, Geography, Science, World Studies, Health/Career and Life Management, English Language Arts, Information and Communications Technology

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- Students work in groups to select a piece of writing — a short story, article, essay, poem, song, children’s story — that relates to themes of climate change or of human interaction with nature or other themes about the environment. They present the work as Readers’ Theater.

Subjects: Arts (Theater Arts), English Language Arts, Geography, Science, World Studies, Humanities and Social Sciences, Health/Career and Life Management

- Students interview people about climate change to find out about people’s general awareness, knowledge and concerns about it. They should plan their interview (or survey) questions in advance. They may also want to create an information sheet or brochure to leave with the interviewees. Be sure to set guidelines for the interview process to ensure student safety, such as interviewing in pairs, interviewing people they know, explaining the purpose of the interview, etc.

Subjects: English Language Arts, Geography, Science, World Studies, Humanities and Social Sciences

- Students work in groups to select a country and research the impact that climate change is having on that country currently and the impact it may have in the future. To share the information, organize an “International Summit on Climate Change.” The groups play the roles of representatives from their country, share their information and then try to reach agreement on what to do to combat climate change.

Subjects: World Studies, Geography, Science, Arts (Theater Arts), English Language Arts, Humanities and Social Sciences

- Students calculate the amount of CO₂ they create when they travel. They could calculate it for particular trips, for a typical day or for other specified times. They could also calculate their total daily personal impact on the environment. There are a variety of online carbon emission calculators that can be used.

Subjects: Mathematics, Geography, Science, Health/Career and Life Management

- Students work in groups to create, perform and videotape a public service announcement for television about one action that people can take to lower emissions.

Subjects: Arts (Theater Arts), English Language Arts, Geography, Science, World Studies, Humanities and Social Sciences, Health/Career and Life Management

- Students investigate their school’s (or Board’s) actions and policies for addressing climate change and for teaching ecological literacy. If there is an existing environmental club in your school, they could be invited to make a presentation to the class. The class could look into how to take part in school initiatives or how to start one themselves.

Subjects: Health/Career and Life Management, English Language Arts, Geography, Science, Humanities and Social Sciences

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- Students describe their own relationship with the natural world by writing a poem, essay or short story, or writing in a journal. They could reflect on, for example, their awareness of the natural world around them, their degree of concern for particular animals or types of vegetation in the face of climate change, or what they would worry about or miss most if their environment or climate were to change drastically.

Subjects: English Language Arts, Health/Career and Life Management, Geography, Science, World Studies, Humanities and Social Sciences

- Groups each research a renewable energy technology or a current initiative that is underway to meet the challenge of climate change. They present their research to the class in an interesting format, for example a slideshow, skit, brochure, interactive map, display or game.

Subjects: Geography, Science, English Language Arts, Humanities and Social Sciences, Arts (Theater Arts)

- Students create a webquest for peers or for younger students on the topic of climate change. They choose a scenario and issue (such as “You are a salmon fisher in British Columbia ...”) and develop the questions or tasks that are to be answered about the scenario and issue. They find what they think are the best websites and resources on the topic, and build them into the webquest. They should include an introduction and conclusion for the task.

Subjects: Information and Communications Technology, Geography, Science, English Language Arts, Humanities and Social Sciences, Health/Career and Life Management

CONNECTIONS WITH OTHER GROUNDWORK GUIDES

- See *The Betrayal of Africa* for themes of the Western world’s effects on developing countries.
- See *Cities and Hip Hop World* for themes of urbanization’s effect on the environment, the overcrowding of cities and social protest.
- See *Oil and Empire* for themes of energy sources and their related political, social and economic issues, and of industrialization’s effects on climate change.
- Have students select other books in the series for independent study.

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GETTING STARTED: CLIMATE CHANGE QUIZ

- 1. Climate change will cause less precipitation worldwide.**
 True False
- 2. Carbon dioxide is a smelly gas that is not found in the natural world.**
 True False
- 3. Global warming does not mean that there will be more tropical storms.**
 True False
- 4. The fastest-growing source of energy today is**
(a) solar (b) tidal (c) wind (d) hydroelectricity
- 5. The oceans hold this percentage of the earth's water:**
(a) 97% (b) 85% (c) 77%
- 6. The earth's atmosphere is a very thick layer of gases, mostly nitrogen.**
 True False
- 7. Of all vegetation, young forests are the least efficient at taking in carbon.**
 True False
- 8. If the warming trend continues as expected, polar bears could be extinct by 2050.**
 True False
- 9. Carbon dioxide speeds plant growth because it stimulates photosynthesis.**
 True False
- 10. A person driving alone in a car produces three times as much carbon dioxide as someone taking public transit.**
 True False

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STUDENT SELF-ASSESSMENT OF RESEARCH SKILLS

Name: _____ Date: _____

CRITERIA	LEVEL 4 (EXCELLENT)	LEVEL 3 (GOOD)	LEVEL 2 (FAIR)	LEVEL 1 (LIMITED)
Conveys information clearly and in an organized way	<ul style="list-style-type: none">shows a high degree of skill and organization in conveying information, and shows confidence	<ul style="list-style-type: none">conveys information skillfully and in an organized way	<ul style="list-style-type: none">conveys information somewhat effectively with some degree of organization	<ul style="list-style-type: none">conveys information in a limited and disorganized way
Communicates appropriately for the intended audience and purpose	<ul style="list-style-type: none">demonstrates great awareness of intended purpose and audience and communicates in a highly proficient way	<ul style="list-style-type: none">demonstrates awareness of intended purpose and audience and communicates effectively	<ul style="list-style-type: none">demonstrates some awareness of intended purpose and audience and communicates fairly well	<ul style="list-style-type: none">demonstrates little understanding of intended audience and purpose
Listens attentively	<ul style="list-style-type: none">demonstrates high degree of attentiveness and interest when listening	<ul style="list-style-type: none">demonstrates attentiveness and interest when listening	<ul style="list-style-type: none">demonstrates some degree of attentiveness and interest when listening	<ul style="list-style-type: none">demonstrates little attentiveness or interest
Listens respectfully	<ul style="list-style-type: none">listens respectfully and shows encouragement to the speaker	<ul style="list-style-type: none">listens respectfully	<ul style="list-style-type: none">listens with some degree of respect; sometimes demonstrates distracting behavior	<ul style="list-style-type: none">demonstrates distracting behavior and disrespect when others are speaking
Responds to the speaker constructively	<ul style="list-style-type: none">responds with highly relevant and thoughtful comments; expertly builds on what the speaker says	<ul style="list-style-type: none">responds with relevant and thoughtful comments; builds on what the speaker says	<ul style="list-style-type: none">responds with some relevant and thoughtful comments	<ul style="list-style-type: none">responds to the speaker in a limited way, with comments that are off-topic and not thought out

SHELLEY TANAKA



ABOUT THE AUTHOR

Shelley Tanaka is a well-known editor and author of books for young people. She has written several non-fiction books, including *Attack on Pearl Harbor* and *The Heat Is On: Facing Our Energy Problem*, as well as seven titles in the award-winning *I Was There* series. She has won the Science in Society Book Award, School Library Journal Best Book, VOYA Nonfiction Honor List, Texas Bluebonnet Master List and two nominations for the Deutsche Jugendliteraturpreis. Shelley Tanaka lives in Kingston, Ontario.

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CLIMATE CHANGE

“[The Groundwork Guides] are excellent books, mandatory for school libraries and the increasing body of young people prepared to take ownership of the situations and problems previous generations have left them.”

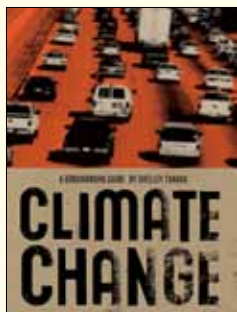
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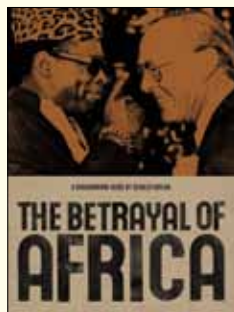
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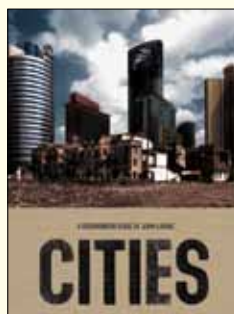
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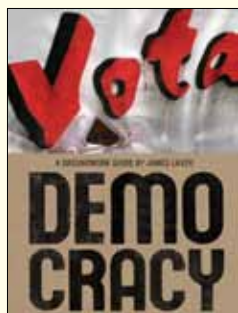
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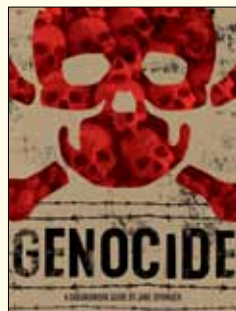
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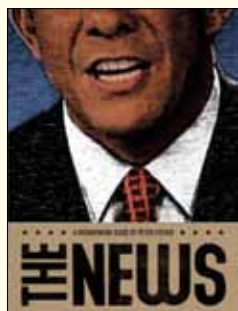
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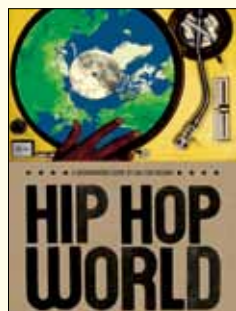
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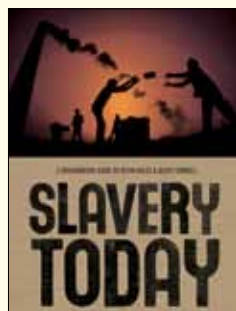
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