

The Canada Science and Technology Museum
presents

**Weather Wise:
A Virtual Exploration Guide
to
Weather and Climate Change**

**Section 4: Climate Change
and
Our Responsibility**



Introduction

It is agreed that the global warming that we are now experiencing is being caused by human activity. A report in February 2007 from the United Nations Intergovernmental Panel on Climate Change concluded that man-made greenhouse gas increases are causing the current average temperature increases.

Effects of Climate Change

Since 1900, the average temperature of our planet has increased by about 0.5°C. With increased global warming will come climate change all over the world. Some areas of the world will get warmer, some colder, some dryer, some wetter. Our weather may become more extreme. A warmer atmosphere can hold more moisture. With more evaporation, the planet will be wetter, which will change flood and drought patterns.

Activity 4.1 If the Climate Changes...

(Recommended for Grades 4 to 6)

Students will think about the consequences of climate change.

Discuss the following questions with the students or have them fill out Activity Sheet 4.1 and share their answers in discussion.

- What will happen to the forests if the weather gets warmer?
- What will happen to northern wildlife if the icebergs melt?
- What will happen to the oceans if the icebergs melt?
- What will happen if there is less snow?
- What will happen if summers are warmer?



Name: _____

Activity 4.1: If the Climate Changes...

Answer the following questions.

Question	Answer
What will happen to the forests if the weather gets warmer?	
What will happen to northern wildlife if the icebergs melt?	
What will happen to the oceans if the icebergs melt?	
What will happen if summers are warmer?	
What will happen if there is less snow?	

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Activity 4.2 What about the Weather...?

(Recommended for Grades 6 and 7)

Students will think about the consequences of climate change.

Many newspapers and magazines have articles on climate change. Have the students list on Activity Sheet 4.2 the changes they think will happen to the planet because of climate change. If children have access to a computer, have them research on the Internet the consequences of climate change (e.g. floods; melting polar ice caps; rising oceans; flooding of coastal areas; droughts; heat waves; forest fires; destruction of current wildlife habitats; disappearing species).

Also have them list some extreme weather occurrences. Tabulate all these ideas on the board and ask them if they can



Name: _____

Activity 4.2
Consequences of Climate Change

Impact of Climate Change

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Extreme Weather Occurrences

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think of any more impacts on society (e.g. spread of disease; loss of homes; changes in farming practices, such as growing different crops).

Useful Web Sites:

United Nations Framework Convention on Climate Change

http://unfccc.int/essential_background/background_publications_htmlpdf/climate_change_information_kit/items/281.php

Environment Canada

http://www.ec.gc.ca/climate/overview_science-e.html

Malaspina University College, B.C.

<http://www.mala.bc.ca/~earles/ipcc-tar-feb01.htm>



Consequences of Climate Change

Activity 4.3 Canadian North

(Recommended for Grades 4 to 6)

Students will learn about the changes happening now to Canadians in the Arctic.

Climate change will affect the Arctic and northern settlements the most.

Print and read some of the description of the changing life in the North presented by Kiilinik High School in Cambridge Bay, Nunavut. Find Cambridge Bay on the map of Canada.

Visit the web site for Kiilinik High School at:

<http://www.climatechangenorth.ca/student-exchange/submissions/kiilinik.html>

If you live in the North develop a student project to describe or counter climate change and add it to the site:

http://www.climatechangenorth.ca/student-exchange/G1_Student_Exchange.html

This site also offers a link-up process for northern schools.

Climate change seems to be already happening in certain areas of the globe but there are things we can do to slow it down. Discuss solutions with students before doing the next activity.



Alternative Energy

Activity 4.4 Alternative Energy

(Recommended for Grades 4 to 7)

Students will realize there are alternatives to fossil fuels.

We use fossil fuels to create heat, electricity and energy for transportation. Are there other ways to create energy?

Discuss with the class renewable and non-renewable energy. You will find information at these web sites:

Canada Science and Technology Museum

http://www.sciencetech.technomuses.ca/english/schoolzone/Info_Energy.cfm

Environment Canada

http://www.ec.gc.ca/EnviroZine/english/issues/16/feature1_e.cfm

Using Activity Sheet 4.4, have the students list as many alternative energy sources to fossil fuels as you can. If they have access to a computer, they can search on “alternative energy”. Have them research one alternative energy and write a short essay about it on their activity sheet.

(Solar, wind, thermal, tidal, etc. — what it is, how it works, cost, size)

Activity 4.5 Alternative Energy (for Advanced Students)

(Recommended for Grade 7)

Students will realize there are alternatives to fossil fuels.

Divide students into groups, each group researching one alternative energy source on the Internet. Each group will write an essay on their assigned energy. Ask them to create a spread sheet or a world map indicating the countries heavily using the assigned alternative energy. Develop energy source symbols for your map.

Useful Web Sites:

World Energy Council

<http://www.worldenergy.org/wec-geis/edc/>

CBC

<http://www.cbc.ca/news/background/climatechange/>

National Research Council — Hydrogen and Fuel Cells

http://www.nrc-cnrc.gc.ca/highlights/2007/0704vancouver_e.html

Edugreen — Solar Energy in India

<http://edugreen.teri.res.in/explore/renew/solar.htm>



Name: _____

Activity 4.4
Alternative Sources of Energy

List as many alternative energy sources to fossil fuels as you can. Research one, research and write a short essay (what it is, how it works, cost, benefits, etc.)

1. _____ 2. _____
3. _____ 4. _____
5. _____ 6. _____

My chosen energy source is: _____

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BBC News — Iceland Launches Energy Revolution
<http://news.bbc.co.uk/2/hi/science/nature/1727312.stm>

Israel Ministry of Foreign Affairs
<http://www.mfa.gov.il/MFA/Facts%20About%20Israel/Science%20-%20Technology/Solar%20Energy%20in%20Israel>

Greenpeace — Wind Energy
<http://www.greenpeace.org/international/campaigns/climate-change/solutions/wind>

Environment Canada — Envirozine
http://www.ec.gc.ca/EnviroZine/english/issues/16/feature1_e.cfm

World Energy Resources and Consumption
http://en.wikipedia.org/wiki/World_energy_resources_and_consumption

Natural Resources Canada Technologies and Applications
http://www.canren.gc.ca/tech_appl/index.asp?CaId=5&PgId=121

Personal Choices

How can we save energy and reduce greenhouse gases?

Activity 4.6 Saving Energy

(Recommended for Grades 4 to 7)

Students will be reminded of their responsibility to save energy to reduce greenhouse gases.

Ask students to fill out Activity Sheet 4.6.

With the students, compile a master list on the board of all the ideas they have listed to save energy at home or while traveling. Discuss the things they have already done or are doing.

Then have several students go to the sites below to find out if there is anything else to add to the list.

United States Environmental Protection Agency
<http://www.epa.gov/climatechange/kids/difference.html>

Environmental Youth Alliance - Saving the Planet 101
<http://eya.ca/files/attachments/sp101booklet.pdf>

(This is a very useful site.)

Energy Alternatives
<http://www.energyalternatives.ca/conservation.asp>

Ministry of Energy Ontario
<http://www.energy.gov.on.ca/index.cfm?fuseaction=conservation.tips>



Name: _____

Activity 4.6
Ways To Save Energy

Make a list of the things you are already doing to save energy at home and when traveling.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

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- Alternative energy and the auto industry; what is available now; what is forecast for the future?
- Transportation of food, the production of CO₂, the impact on the planet and possible solutions.
- or a topic of their choice.

Students should use reliable sites on the Internet, which can be a good source of information on climate change. Have them credit the site they referenced.

There are also many magazines in the school library that will have articles on these subjects.

Books where you can find information on the subject:

Hawkes, Nigel. **Climate Crisis (Saving our World)**,
London: Watts, 2003. ISBN 0-749650-96-6

Jennings, Terry J. **Changing Climates**,
North Mankato, MN: Smart Apple Media, 2006. ISBN 1-583407-28-6

Silverstein, Alvin. **Weather and Climate**,
Brookfield, Conn.: Twenty-First Century Books, 1998. ISBN 0-761332-23-5

Spilsbury, Louise. **Changing Climate: Living With the Weather**,
Chicago, Ill. : Raintree, 2006. ISBN 1410911128

Suzuki, David & Dressel, Holly. **Good News for a Change**,
Vancouver, B.C.: Greystone Books, 2002. ISBN 0-155054-92-6

Unwin, Mike. **Climate Change**,
Chicago, Ill.: Heinemann Library, 2007. ISBN 1-403482-16-0

With this growing awareness of the fragility of our planet, your students will set examples for the adults in their lives.

Name: _____

Activity 4.1: If the Climate Changes...

Answer the following questions.

Questions	Answers
What will happen to the forests if the weather gets warmer?	
What will happen to northern wildlife if the icebergs melt?	
What will happen to the oceans if the icebergs melt?	
What will happen if summers are warmer?	
What will happen if there is less snow?	

Name: _____

Activity 4.2 Consequences of Climate Change

Impacts of Climate Change

1	
2	
3	
4	
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Extreme Weather Occurrences

Name: _____

Activity 4.4 Alternative Sources of Energy

List as many alternative energy sources to fossil fuels as you can. Choose one, research and write a short essay (what it is, how it works, cost, benefits, etc.).

- | | |
|----------|----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | 6. _____ |
| _____ | _____ |

My alternative energy source is: _____

Name: _____

Activity 4.6

Ways to Save Energy

Make a list of the things you are already doing to save energy in the home and when travelling.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

