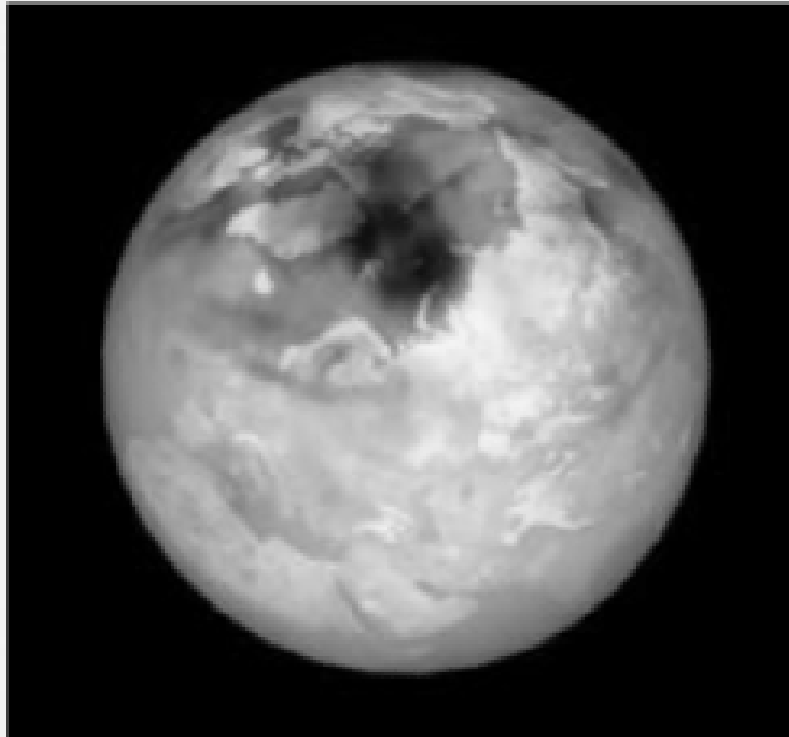


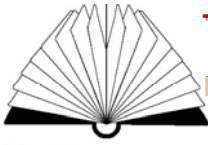
The Northern Edge

Study Guide

# Climate Change

***Climate Change***





## Climate Change

### Introduction

This story is from **Issue #5 of The Northern Edge**. The story tells how three adult learners do research about climate change. They go on-line and learn about Inuit perspectives of climate change. They talk to local Elders and to Bob Bromley from Ecology North. They learn about unpredictable weather and some effects of climate change on things such as wildlife and communities.

There are three on-line learning activities: 1) eight tips to use less energy, 2) ecological footprint quiz, and 3) writing personal thoughts and feelings about climate change

This story offers a chance to discuss cause and effect. Learners can also look at possible ways to take action to help reduce greenhouse gases, and think about why people need to take action.

This section first presents a list of eight learning activities and the written text for the story. The pages following the written text give instructor notes and handouts for each activity, in the order on the list.

This symbol marks the written text for the story.

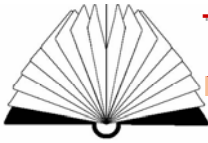




This symbol marks instructor notes.

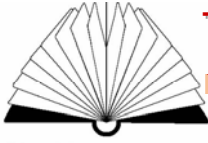


This symbol marks handouts to copy for learners.





<b>Climate Change</b> List of Learning Activities		
<b>Instructor Notes</b> 	<b>Handouts</b> 	<b>Page #s</b>
1) Vocabulary	1 handout	7 to 10
2) Language skills	1 handout	7, 11, 12
3) Questions	2 handouts	13 to 17
4) Writing	2 handouts	18 to 23
5) Cause and effect	1 handout	24 to 29
6) Where is the comma?	1 handout	30 to 32
7) Climate change – what’s the big deal?	4 handouts	33 to 42
8) Ideas for hands-on activities	No handout	43, 44



**Text - Climate Change**  
Issue #5 The Northern Edge

Three adult students, Sara, Ken, and Jim are going to do a research project on climate change in the north.

**Ken:** Hey Jim and Sara. We have to find partners for our research project. Do you want to work together?

**Jim:** Sure Ken. Have you thought about a topic?

**Ken:** I was thinking we could do something about the environment.

**Sara:** Count me in. We could do some research on climate change.

**Ken:** That's a great idea Sara. One of the Elders was just telling me how winters now are a lot warmer than when she was a child.

**Sara:** Why don't we interview some people in our community?

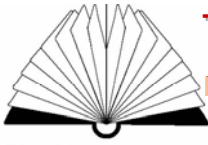
**Jim:** Right and let's use the internet to do some of our research.

**Ken:** Okay great. Let's get started.

**Jim:** I did a search in Google and found a great site. It's called [www.inuitcircumpolar.com](http://www.inuitcircumpolar.com)

**Ken:** What did you find there?

**Jim:** I found some really good information on climate change in the north written by a woman named Sheila Watt-Cloutier. She's from Iqaluit and she's the chair of the Inuit Circumpolar



Conference. They defend the interests of Inuit living in Canada, Alaska, Greenland and Russia.

**Ken:** What did she say?

**Jim:** I took some notes when I read her speech. Ms. Watt-Cloutier says we are at a key moment in the history of the planet. She says the earth is melting and we must come together and address climate change. She says global warming is affecting the entire planet, but it is impacting the Arctic much faster.

She says that "our region is the globe's barometer of climate change, and Inuit are the mercury in that barometer. Protect the Arctic and you will save the planet," she said. "Use us as your early warning system. Use our stories as vehicles to reconnect us all so that we can understand the people and the planet are one."

She said, "Our Elders and hunters have intimate knowledge of the land, sea ice, and animals. Talk to hunters across the north and they will tell you the same story. The weather is increasingly unpredictable. The look and feel of the land is different. New species of animals including barn owls, robins, pin-tailed ducks, and salmon are 'invading' our region. The sea-ice is changing. Winters are not as cold as they used to be and permafrost is melting. Hunters are having difficulty navigating and traveling."

**Ken:** That's great Jim. Good work. Sara made an appointment with a biologist, Bob Bromley, right here in Yellowknife. He's from the environmental organization Ecology North.



**Jim:** Okay. Let's meet again tomorrow and find out what she learned.

**Sara:** I had a good meeting with Bob Bromley at Ecology North. He said some very interesting things.

**Jim:** What did he say?

**Sara:** He said that in the past the weather was very predictable. Our Elders and hunters knew where to go to harvest what they needed and they knew how to get there safely. This is part of what is called traditional knowledge and it has been developing over hundreds and thousands of years.

Bob said that one major effect of climate change is that the weather is not as reliable as it used to be. Hunters are now going through the ice on paths that used to be safe and secure. When they use routes that used to be reliable they're finding water on top of the ice.

**Jim:** Did he say anything about the permafrost melting?

**Sara:** Yes. He said that the melting of the permafrost is causing landslides in some areas. It's also making it harder to build and maintain pipelines and roads. Airstrip maintenance costs are going up. Buildings are sinking and need expensive renovations.

**Jim:** The other thing I was thinking about is wildlife. How are they being affected by climate change?

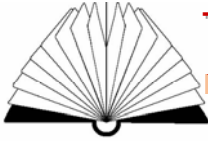
**Sara:** Caribou travel north each spring to their summer habitat and leave their main predator, the wolf, behind. Wolves follow



the caribou only to the tree line. Bob said that today with climate change the tree line is marching north. Caribou may soon lose their ability to escape their predators during calving season.

As well there are more bugs and maybe even more species of bugs. Bugs harass the caribou so much it affects their energy. As a result, they aren't able to store sufficient fat to make it through the winter carrying their calves. Scientists predict that caribou reproductive rates will decline.

**Jim:** Excellent work Sara. Ken found some really good information on climate change from an Inuit perspective. Now you've added important information about how changes in the climate are affecting Dene and other Aboriginal people.



**Vocabulary  
Learning Activity 1**

One handout

Learners define words from the story and use them in sentences. Encourage learners to work with a partner if they want. Discuss the words as a group.

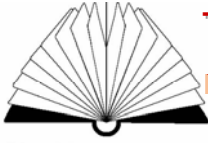


**Language skills  
Learning Activity 2**

One handout

Learners learn about compound words from the story Climate Change. Learners also make a list of other compound words they know.





### Vocabulary Learning Activity 1

Use a dictionary to find the meaning of the words from the story.

1) Rely \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

2) Environment \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

3) Unpredictable \_\_\_\_\_

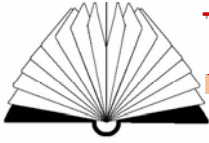
\_\_\_\_\_  
\_\_\_\_\_

4) Permafrost \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

5) Atmosphere \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



6) Reliable \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

7) Renovations \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

8) Ecology \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Write a sentence with each of the above words.

1) Rely \_\_\_\_\_

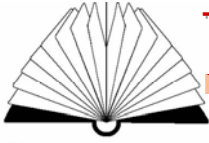
\_\_\_\_\_  
\_\_\_\_\_

2) Environment \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

3) Unpredictable \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



4) Permafrost \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

5) Atmosphere \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

6) Reliable \_\_\_\_\_

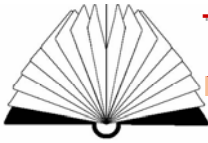
\_\_\_\_\_  
\_\_\_\_\_

7) Renovations \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

8) Ecology \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



Language skills  
Learning Activity 2

What is a compound word? We make a compound word when we put together two smaller words. Here are some examples.

Two smaller words		Compound word
Under	Pass	Underpass
After	Noon	Afternoon
To	Day	Today
Birth	Day	Birthday
Arm	Chair	Armchair

The story Climate Change has some compound words. We took them apart and made two lists. Draw a line to connect the two smaller words that make a compound word from the story.

- |       |        |
|-------|--------|
| Land  | life   |
| Air   | thing  |
| Pipe  | slides |
| May   | strip  |
| Under | lines  |
| Wild  | be     |
| Any   | stand  |



Talk with your classmates. Can you think of any more compound words you know? If so, write the two smaller words and the compound word in the table below.

<b>Two smaller words</b>	<b>Compound word</b>



**Questions  
Learning Activity 3**

Two handouts

**3-1: Story questions**

Learners use sentences and correct punctuation to answer eight questions about the story **Climate Change**.

**3-2: Journal writing**

Learners use questions to guide their journal writing.



**Questions  
Learning Activity 3**

**3-1: Story questions**

Answer the following eight questions. Use one or more sentences for each answer. Begin each sentence with a capital letter and end with the correct punctuation.

- 1) Sara, Ken, and Jim learned about climate change from two main sources. What or who were they?

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- 2) Who does Sheila Watt-Cloutier speak for? What does she say affects our entire planet?

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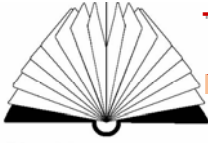
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3) Why does Sheila Watt-Cloutier say that we should use the Arctic as an early warning system?

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4) The weather is increasingly unpredictable. Name four changes in the environment that are caused by the change in weather patterns.

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5) Hunters can no longer rely on traditional knowledge to survive. What are some dangers that hunters face because of climate change?

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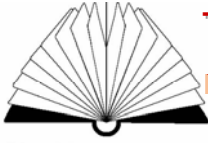
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6) What happens when the permafrost melts?

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7) Bob Bromley says the tree line is marching north. What does this mean? In what way does this affect the caribou?

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8) In what way do bugs affect caribou?

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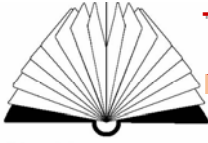
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## Questions Learning Activity 3

### 3-2: Journal writing

Use these questions to guide your journal writing.

- ✓ What changes have you noticed in the weather patterns in your community or region?
- ✓ What have your Elders told you about the changes they have noticed since they were young?
- ✓ What do you think will happen in your area if unpredictable weather patterns continue?
- ✓ What do you think you can do about it?



## Writing Learning Activity 4

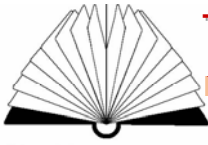
Two handouts

### 4-1: Word beginnings

Learners look at prefixes re-, in-, im-, and un-.

### 4-2: Write a letter

Learners write a letter to the Prime Minister of Canada or to the Premier of the NWT. The handout offers two ideas of what learners can write about, or they can use their own ideas. The handout offers tips to write a letter.



## Writing Learning Activity 4

### 4-1: Word beginnings

What is a prefix? A prefix is a group of two or three letters at the beginning of a word. A prefix changes the meaning of the word and makes a new word. Here are a few examples.

Root word	Prefix	New word
New	Re-	Renew
Complete	In-	Incomplete
Passable	Im-	Impassable
Able	Un-	Unable

What do these root words mean?

- ✓ Call
- ✓ Join
- ✓ New
- ✓ Trace

Put re- in front of each root word. Read the new word and meaning.

- ✓ Recall: Call again
- ✓ Renew: Make new again
- ✓ Rejoin: Join again
- ✓ Retrace: Trace again



The prefix re- at the beginning changes the meaning of the root word. Here is a list of words from the story **Climate Change** that have the prefix re-. What do the root words and the new words mean?

We did the first one. Do the others the same way.

**Return**      Turn means to go around.  
Return means turn again.

**Reproduce** \_\_\_\_\_  
\_\_\_\_\_

**Research** \_\_\_\_\_  
\_\_\_\_\_

**Reconnect** \_\_\_\_\_  
\_\_\_\_\_

**Recycle** \_\_\_\_\_  
\_\_\_\_\_



Complete the following sentences in the same way as we did the first sentence.

- 1) If un- means not, then the word unpredictable means not predictable.
- 2) If un- means not, then the word unable means \_\_\_\_\_.
- 3) If in- means not, then the word incomplete means \_\_\_\_\_.
- 4) If im- means not, then the word impassable means \_\_\_\_\_.
- 5) If re- means back again, then refund means \_\_\_\_\_.



## Writing Learning Activity 4

### 4-2: Write a letter

Write a letter to the Prime Minister or to the NWT's Premier.

Right Honourable \_\_\_\_\_  
Prime Minister of Canada  
House of Commons  
Ottawa, ON  
K1A 0A6

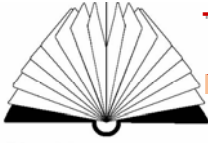
Premier \_\_\_\_\_  
Legislative Assembly  
Box 1320, Yellowknife, NT  
X1A 2L9

Two ideas of things to write about:

- ✓ Ask what the federal or territorial government is doing in the NWT to reduce greenhouse gases.

Canada signed the Kyoto Protocol. It is an international agreement to reduce greenhouse gas emissions. The Kyoto Protocol came into effect on February 16, 2005. Canada has committed \$10 billion in the next seven years to decrease greenhouse gas emissions.

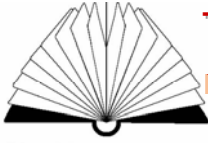
- ✓ Ask what the federal or territorial government is doing to tell people what they can do to reduce greenhouse gas emissions.  
People produce many greenhouse gases when they burn fossil fuels such as gasoline, propane, coal, and oil.
- ✓ What other issue about climate change could you write about?



Tips to write your letter.

- ✓ Say why you are writing. Make your request in the first paragraph.
- ✓ Say what you have learned and how you learned it. State your feelings about the issue. Set out the necessary and truthful facts.
- ✓ Tell the steps you have taken to lessen the impact on the environment.
- ✓ Be brief and organized and try to keep the letter to one page.
- ✓ Be polite and don't use slang.
- ✓ Ask yourself if you should send the letter to anyone else?
- ✓ Ask for a reply. You should get one.





## Cause and effect Learning Activity 5

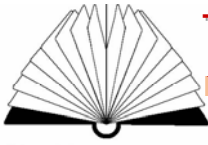
One handout

We cannot assume learners know the concept of cause and effect. Use the following or another concrete example to demonstrate.

- i) Ask learners what is cause? What is effect? With no warning grab a 3-hole punch and something breakable, such as an apple. Smash the apple with the punch. You now have the learners' full attention.
- ii) Ask who or what caused the apple to break? The response is that you did and the punch.
- iii) Ask what is the effect? The response is that the apple smashed.

Use the information on the following page to show learners about the concept of cause and effect, to discuss it, and to write about it.

The handout uses some examples of cause and effect from the story **Climate Change** to give learners some practice with the concept. It also shows how effects can become a cause to create other effects and so on.



**Cause** A person, thing, or action that makes something happen.

**Effect** What happens or the result.

Think about the instructor, the 3-hole punch and the apple.

**What is the cause?** The instructor and the hole punch

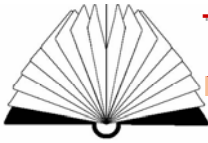
**What is the effect?** The apple smashed

We can write a sentence about cause and effect in two ways.

<b>Cause</b>	<b>Effect</b>
When the instructor hit the apple with a hole punch	the apple smashed.

Reverse the headings. Enter the effect and ask learners for the cause.

<b>Effect</b>	<b>Cause</b>
The apple smashed	when the instructor hit it with the hole punch.



### Cause and effect Learning Activity 5

Use this handout to explore the idea of cause and effect. Learn to write about cause and effect in different ways.

i) **Think about this. What happens when you peel an onion?**

What is the cause? Peeling an onion

What is the effect? crying

First, read a sentence with the cause at the beginning.

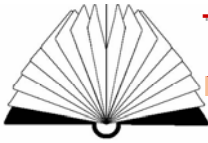
✓ When I peeled the onion I cried.

<b>Cause: peeling an onion</b>	<b>Effect: crying</b>
When I peeled the onion	I cried.

Second, read a sentence with the effect at the beginning.

✓ I cried when I peeled the onion.

<b>Effect: crying</b>	<b>Cause: peeling an onion</b>
I cried	when I peeled the onion.



ii) **Think about this. What happens when you cut your finger?**

What is the cause? \_\_\_\_\_

What is the effect? \_\_\_\_\_

<b>Cause:</b>	<b>Effect:</b>

Write a sentence with the cause at the beginning and the effect at the end.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

<b>Effect:</b>	<b>Cause:</b>

Write the same sentence with the effect at the beginning and the cause at the end.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



- iii) **Think about some things we learned from the story Climate Change. Notice in this list that an effect can become a cause that creates another effect. Cause and effect doesn't just stop. It shows how things are connected.**

Fill in five more things you learned about cause and effect related to climate change.

<b>Cause:</b>	<b>Effect:</b>
Too many greenhouse gases	Climate change
Climate change	Permafrost melting
Permafrost melting	Landslides
Climate change	More bugs
More bugs	Caribou less energy
Caribou less energy	Caribou fewer calves



Pick one cause and effect from the list on the previous page.

What is the cause? \_\_\_\_\_

What is the effect? \_\_\_\_\_

Write a sentence with the cause at the beginning and the effect at the end.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Pick a different cause and effect from the list.

What is the cause? \_\_\_\_\_

What is the effect? \_\_\_\_\_

Now write the sentence with the effect at the beginning and the cause at the end.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## Where is the comma? Learning Activity 6

One handout

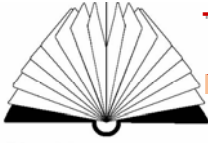
Learners explore what the comma is and how they should use it.

- i) Review the first part of the handout to introduce or reinforce correct punctuation.

The handout gives examples of using a comma to create a brief pause between parts of a sentence. It also shows that if we write the sentence in a different order we don't need a comma.

The handout also talks about how to use a comma to separate each item in a list in a sentence. It recognizes that the last item before the 'and' may or may not have a comma after it – that both ways are correct punctuation.

- ii) The second part of the handout asks learners to put commas in the correct places in four sentences. It also asks them to rewrite one sentence so it doesn't need the comma.



## Where is the comma? Learning Activity 6

What is a comma? A comma is a punctuation mark. We use a comma in two main ways.

- i) To mark a little pause or break between parts of a sentence
- ii) To separate items in a list in a sentence

### i) Read an example of how to use a comma to mark a little pause.

- ✓ Because I broke my tooth, I went to the dentist.

When a sentence starts with a 'because' phrase, we put a comma at the end of the phrase and before the rest of the sentence.

We can also write the sentence in a different order and it doesn't need the comma. Read this version of the sentence.

- ✓ I went to the dentist because I broke my tooth.

Most sentences that need a comma have two ideas.

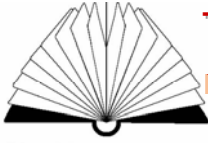
### ii) Read an example of how to use a comma to separate items in a list.

- ✓ Mary and John went camping. They took the tent, pots and pans, sleeping bags, food, fishing gear, and the dog.

We always use commas to separate items in a list in a sentence. Some people leave out the comma after the last item in the list. Either way is proper punctuation.

- ✓ Mary and John went camping. They took the tent, pots and pans, sleeping bags, food, fishing gear and the dog.





Put commas in the correct places in the following sentences.

- 1) Because the climate is changing we have unpredictable weather.
- 2) Because of thin ice hunters can't always find safe places to travel.
- 3) Climate change can cause warmer winters thin ice more bugs new species melting permafrost and landslides.
- 4) People help reduce greenhouse gases when they drive less walk more use less electricity and turn down the heat.

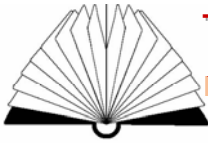
Rewrite sentence 1) and sentence 2) so you don't have to use a comma.

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## Climate change – what's the big deal? Learning Activity 7

Four handouts

### 7-1: What is weather and climate?

Before learners see the handout, brainstorm these two questions:  
What is weather? What is climate?

Review the handout after the brainstorm. Use the questions in the handout to have a class discussion.

### 7-2: What is the greenhouse effect?

Before learners see the handout, brainstorm these two questions:  
What is atmosphere? What are greenhouse gases?

Or ask learners to do research to find the answers to these questions. The following website is an excellent resource:

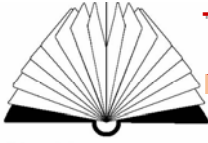
✓ <http://www.climatechangenorth.ca/index.html>

Review the handout after the brainstorm or the research.

Ask learners to do the experiment to show how greenhouse gases trap heat.

Discuss these six questions on the handout after learners complete the experiment.

- i) Which cup had the warmer temperature? Why?
- ii) Which cup is a better model of the earth and its atmosphere?
- iii) Why does the earth need the atmosphere?
- iv) What would happen if the atmosphere didn't trap the heat and the heat escaped?
- v) What would happen if too much heat gets trapped?



- vi) What would happen if more and more greenhouse gases go into the atmosphere?

### 7-3: What are the impacts of climate change?

Learners do research to find out the impacts of climate change.

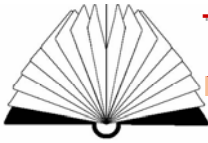
First, brainstorm things they learned from the on-line story **Climate Change** or things they know from their experience.

The handout asks learners to write down three impacts of climate change on wildlife and three impacts of climate change on people from the story **Climate Change**.

Ask learners to work in pairs or groups of three. The handout asks them to do research about impacts of climate change in their community and region. It asks them to write a paragraph to explain if the impacts on wildlife and people are the same or different in their community or region as in the story.

### 7-4: What can we do to help reduce greenhouse gases?

- i) Brainstorm the questions on the handout with learners.
  - ii) Ask learners to make their personal commitment – name and write down three ways they can use and burn less fossil fuels.
  - iii) Use the following websites for other good interactive activities that raise awareness and encourage people to take action.
- ✓ <http://www.climatechange.gc.ca/onetonne/calculator/english/index.asp> This is the federal government's one tonne challenge.
  - ✓ [www.cpawscalgary.org/education/pdf/how-connected.pdf](http://www.cpawscalgary.org/education/pdf/how-connected.pdf) This website has a great 'lifestyle' activity, including a living lightly checklist.
  - ✓ <http://www.onelesstonne.ca/> A tool to help people identify ways they can use less energy at home and on the road.



## Climate change – what’s the big deal? Learning Activity 7

### 7-1: What is weather and climate?

#### What is weather?

Weather describes what is happening outdoors in a given place at a given time. Rain or snow, temperature, and wind conditions are all part of the weather. Weather can change in a very short time.

Weather is all around us. It may be one of the first things you notice when you wake up in the morning. If it’s cold and snowy, you wear a jacket. If it’s hot and sunny, you wear shorts.

- ✓ What is the weather this week where you are?
- ✓ What was the weather like at this time of year last year? Or ten years ago?
- ✓ What changes have you heard about on the weather reports or from Elders or other people who live close to the land?
- ✓ Have you noticed any changes in the weather where you live over the past few years? If you have, what are the main changes?



### **What is climate?**

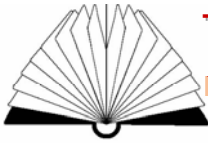
Climate describes the main weather conditions over time for an area. It describes the total of all weather that happens over a period of years in a given place. This includes

- ✓ Regular weather conditions
- ✓ Seasons of summer, fall, winter, and spring
- ✓ Weather events such as tornadoes and floods

Climate tells us what it is like in the place where you live.

Vancouver has a mild, wet climate.

- ✓ **What kind of climate does the NWT have?**
- ✓ **What is the difference between climate and weather?**
- ✓ **Think about cause and effect. What is the cause and effect relationship between weather and climate?**



## Climate change – what’s the big deal? Learning Activity 7

### 7-2: What is the greenhouse effect?

To learn about the greenhouse effect we first need to define the atmosphere and greenhouse gases.

#### What is the atmosphere?

- ✓ The atmosphere is layers of air that surround the earth. It’s a mixture of gases and solid and liquid particles.
- ✓ Fifty percent of the atmosphere is within 5 km of the surface of the earth – lower than the top of Mount Everest.
- ✓ The atmosphere helps to protect us from things such as ultraviolet or UV radiation from the sun.
- ✓ The atmosphere includes greenhouse gases.

Main greenhouse gases	Some important sources
Water vapour	Rivers, lakes, oceans, plants
Carbon dioxide	Burning oil, gasoline, coal, diesel
Methane	Decomposing garbage, manure
Nitrous oxide	Fertilizers, burning organics



### How does the atmosphere create the greenhouse effect?

Do this experiment to learn about the greenhouse effect.

#### Gather these materials to do the experiment.

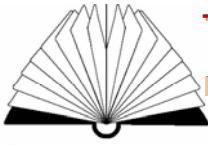
- ✓ Two foam cups
- ✓ Two thermometers
- ✓ Rubber bands
- ✓ Pencils
- ✓ Potting soil
- ✓ Plastic wrap
- ✓ Sunlight

#### Follow these steps to do the experiment:

- 1) Fill both cups half full of damp potting soil.
- 2) Cover one cup with plastic wrap. Hold the plastic wrap with an elastic rubber band.
- 3) Use a pencil to poke a hole into the side of each cup one inch up from the bottom.
- 4) Push the thermometer through the hole into the potting soil. Make sure the thermometer doesn't go through the cup.
- 5) Put the cups in sunlight for 30 minutes.
- 6) Pull out the thermometer, quickly read the temperature, and write it down.

Open cup \_\_\_\_\_

Covered cup \_\_\_\_\_



Discuss these questions as a group.

- i) Which cup had the warmer temperature? Why?
- ii) Which cup is a better model of the earth and its atmosphere?
- iii) Why does the earth need the atmosphere?
- iv) What would happen if the atmosphere didn't trap the heat and the heat escaped?
- v) What would happen if too much heat gets trapped?
- vi) What would happen if more and more greenhouse gases go into the atmosphere?

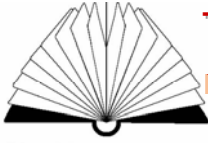
Greenhouse gases in the atmosphere trap the heat from the sun close to the earth, like a blanket traps your body heat close to your body.

**This is the greenhouse effect.**

Many scientists and other people believe that human activity produces way too many greenhouse gases. They believe these greenhouse gases cause unwanted climate change

Cause	Effect
Human activity	Too many greenhouse gases
Too many greenhouse gases	Too much greenhouse effect
Too much greenhouse effect	Climate change
Climate change	Impacts on the land, wildlife, communities.





**Climate change – what’s the big deal?  
Learning Activity 7**

**7-3: What are the impacts of climate change?**

Think about the on-line story **Climate Change**. Sara, Ken, and Jim found out that northern people, communities, and wildlife feel the impacts of climate change.

From the story, list three impacts of climate change on wildlife:

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From the story, list three impacts of climate change on people:

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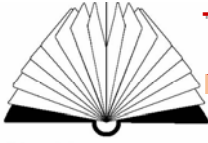
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Think about your own community and region. Talk to hunters, trappers, Elders, and other people.

Write a short paragraph to answer each of these questions:

- i) Are the impacts of climate change on wildlife in your community or region the same or different from those in the story? Explain.

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- ii) Are the impacts of climate change on people in your community or region the same or different from those in the story? Explain

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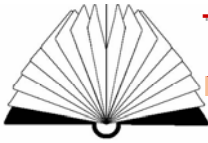
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## Climate change – what’s the big deal? Learning Activity 7

### 7-4: How can we help reduce greenhouse gases?

#### Brainstorm as a group:

- ✓ How do we use and burn fossil fuels in our homes and our community every day?
- ✓ What could we do to use and burn less fossil fuels in our homes and our community every day?
- ✓ What prevents us from using and burning less fossil fuels in our homes and our community?
- ✓ What helps us use and burn less fossil fuels in our homes and our community?

#### Make a personal commitment

- ✓ What three things will I do to use and burn less fossil fuels in my home and my community?

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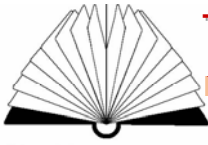
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## Ideas for hands-on activities Learning Activity 8

No handout

- ✓ Make posters that show how climate change affects an animal or bird that lives in the area.
- ✓ Make a mural that shows changes taking place in the NWT. Divide into small groups. Ask each group to do research and focus on an area of the NWT.
- ✓ Interview an Elder who is willing to talk about what the climate was like in the past and what changes they see and know about. Make a poster to show what the environment looked like in the past. Show how the environment looks today. Remember to credit the Elder with the information on the poster.
- ✓ Write a story about a fictional character that fishes, hunts, or picks berries. Ask learners to identify the plot, the setting, a conflict, a conclusion, the purpose, and the point of view.

For example, the **plot** revolves around an Elder hunter who sees changes in the land over a number of years and how it affects his culture. The **setting** is the far north. The **conflict** happens because the caribou changed their migration route and fewer caribou means less food. The **purpose** is to remind people that we can't control change. The **point of view** is the first person – the Elder hunter tells the story.

- ✓ Write a poem using the free writing strategy. See Learning Activity 7 for the story 'Before I was Born' in this Study Guide.



- ✓ Write and record an environmental song. Brainstorm background information on climate change. Write key words on the board. Divide into small groups of two or three people. Ask each group to pick a melody they already know or to make up a new melody. Ask each group to write the words to match their melody.

Encourage learners to use any music style they like – folk, rap, ballad, drum song, etc. Write the name of the group on chart paper. Write down the words of the song. Ask each group to practice their song and perform in front of others. Tape the songs and share them among the small groups.

- ✓ Use environmental songs as a teaching tool. Ask learners about environmental songs they already know. Introduce them to environmental songs they don't know or search the internet for songs.

Talk about the music and the words. What message is the singer giving? Who is the audience? Why do people sing these songs?

- ✓ Hold a science fair. Put up posters, a mural, Elders' stories, written materials, soap sculptures, etc. and invite the public to come and see. Prepare and distribute advertisements. Serve refreshments, give prizes.



## Resources

### Websites:

- ✓ [www.climatechangenorth.ca/index.html](http://www.climatechangenorth.ca/index.html)

This is the best northern educational resource about climate change. It helps northerners understand climate change and what we can do to help. Backgrounders, lesson plans, resources, curriculum links, glossary, and student exchange. Includes lots and lots of other links. Things for students, teachers, and everyone else about climate change.

- ✓ [www.cpawscalgary.org/education/pdf/how-connected.pdf](http://www.cpawscalgary.org/education/pdf/how-connected.pdf)

Use the free downloadable teaching resources from the Canadian Parks and Wilderness Society. **How We're Connected**. 2005

- ✓ [www.climatechange.gc.ca/onetonne/calculator/english/index.asp](http://www.climatechange.gc.ca/onetonne/calculator/english/index.asp)

How many greenhouse gases do you produce every day? Answer the questions to find out how you compare with other Canadians. Take the One Tonne Challenge. Find out how you can help reduce greenhouse gas emissions and make a commitment to do it.

- ✓ [www.onelesstone.ca/](http://www.onelesstone.ca/)

A simple web-based tool that helps you combat climate change by choosing among 20 actions and committing to change the way you use energy at home and on the road. Sponsored by the Pembina Institute.



- ✓ [http://adaptation.nrcan.gc.ca/posters/post-affich\\_en.asp?Poster=wa](http://adaptation.nrcan.gc.ca/posters/post-affich_en.asp?Poster=wa)

Order a great poster 'Climate Change in the Western Arctic'. See it and order on-line or call toll free 1-800-622-6232 or fax 819-779-2833.

- ✓ [www.inuitcircumpolar.com](http://www.inuitcircumpolar.com)

This is the Inuit Circumpolar Conference website. This is the website where Jim in the story found information about climate change in the north.

- ✓ [www.taiga.net/nce/schools/primer/index.html](http://www.taiga.net/nce/schools/primer/index.html)

An on-line slide show about climate change.

- ✓ [edugreen.teri.res.in/explore/climate/climate.htm](http://edugreen.teri.res.in/explore/climate/climate.htm)

EduGreen – learn more about climate change and the greenhouse effect.

### Videos:

- ✓ Blagg, Linda.

**Greenhouse Warming** 16 minutes, with teacher's notes.

Burnaby, BC.

Available at Aurora College Thebacha Campus