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The Science of Climate: Are BC's microclimates changing?

From the temperate rainforests of our coast, to BC's more extreme mountains and plateaux, to the drier regions of the south and east, the local climates or weather conditions (called microclimates) around British Columbia are amazingly diverse. Our global climate, or macroclimate, is changing as the Earth warms, but are BC's microclimates changing too?

Climate change is a very active research area at the University of Victoria. For example, marine ecologist Julia Baum is working to advance understanding of the impacts of climate change in the ocean, and to inform and catalyze effective ocean conservation solutions. Biology professor Terri Lacourse studies plant records from the past to understand how climate changes affected vegetation over time, and Colin Goldblatt, professor of earth and ocean sciences, studies the past, present and future climate by analyzing the state of the atmosphere.

This activity has three parts: exploring how climates may have changed in our own communities by interviewing family or community members, making a model to see how the greenhouse effect works, and being part of the solution to global warming!

Activity #1: Be a climate change reporter

Find an adult who has lived for a long time in your area of BC (like a grandparent, parent, aunt, uncle, or community elder), and interview them using the following questions:

1. How would you describe the current micro (local) climate where you live?
2. Do you think the microclimate has changed since you were young?
3. If so, how has it changed? Examples might be: warmer/cooler, drier/more moisture, windier, or any other changes.
4. Do you think humans affect the world's climate? Why or why not?

Write up what you find out, as a letter or article, and see if you can think of a way of sharing it with others (what about your local or school newspaper or website?).

Activity #2: Global warming in a jar

You need: A sunny day!

- Two clean, see-through wide-mouthed canning or spaghetti jars
- Plastic wrap and a rubber band
- Two small thermometers
- The Experiment Results Sheet
- A pencil

This is an activity to model how the greenhouse effect works. Gather some friends or the people you interviewed earlier and see what you find out.

1. Print off a copy of the Experiment Results Sheet.
2. Take everything outside on a bright sunny day.

3. Place one small thermometer into each jar. Make sure you can read them easily.
4. Leave one jar open at the top and cover the second one with clear plastic wrap. Place the jars so that they will receive the same amount of sunlight.
5. Read off the temperature in each jar every five minutes for 30 minutes, and make a note of your results on the Experiment Results Sheet.

What do you notice? Did one jar get warmer than the other? If so, why do you think this happened?

Answer: The plastic wrap mimics what certain gases in the atmosphere, like carbon dioxide and methane, do when they form a layer or 'greenhouse' over the Earth.

Activity #3: You be the solution!

Global warming is caused by our increased use of fossil fuels (like oil, gas and coal) for electricity, transportation and many other uses. Emissions from burning fossil fuels build up in the earth's atmosphere and act in much the same way as the plastic wrap in your experiment.

So let's be part of the solution! Brainstorm with your friends or family how each of you can change something you do, to help our planet. Here are some ideas to get you started:

- Reduce your energy consumption at home by turning off the lights and your computer when not in use.
- Try to walk or bicycle a few times a week instead of asking your parents to drive you!
- Reduce, reuse and recycle! What can you recycle in addition to household collection? By recycling half of your household waste, you can save 2,400 pounds of carbon dioxide annually. That's a lot of greenhouse gas!

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Experiment Results Sheet

Global Warming in a Jar

Once you have placed the two jars for the global warming experiment in the sun, make a prediction about what will happen. Will they be the same or different in some way? Write what you think will happen in the space below.

My prediction or hypothesis:

My temperature observations:

Time	Jar #1: Uncovered	Jar #2: Plastic wrap
0 minutes		
5 minutes		
10 minutes		
15 minutes		
20 minutes		
25 minutes		
30 minutes		

What happened in your experiment? Was your prediction correct? Record your results and thoughts below: