Activity 3: Adaptation and Mitigation

Summary

In this activity, students collaborate to define and identify the concepts of adaptation and mitigation as they pertain to climate change. They also further their understanding of how Canada is helping biodiversity adapt to climate change.

Duration: 60 to 75 minutes			
Learning outcomes		Competency outcomes	
After participating in the activity, students will be able to:		During this activity, students will develop or improve these abilities:	
•	Define and differentiate between the concepts of adaptation and mitigation as they pertain to climate change,	CollaborationInferenceResearch	
•	Identify examples of adaptation and mitigation measures,	Critical thinking	
•	Discuss the importance of using both		
	adaptation and mitigation measures to fight		
	against climate change, and		
•	Identify resources and processes that		
	ecosystems provide (ecosystem services)		
Set-up and materials			
	Computer, tablet, or dictionary (one per team) Colour printout of teacher BLM Adaptation and Mitigation Goals , cut into strips Copies of student BLM Adaptation or Mitigation? student worksheet		
	Adapting to Our Changing Climate in Canada poster		
• • • •	concepts of adaptation and mitigation as they pertain to climate change, Identify examples of adaptation and mitigation measures, Discuss the importance of using both adaptation and mitigation measures to fight against climate change, and Identify resources and processes that ecosystems provide (ecosystem services) -up and materials Computer, tablet, or dictionary (one per team) Colour printout of teacher BLM Adaptation and Copies of student BLM Adaptation or Mitigatio Copies of the Climate Change: Adaptation and Adapting to Our Changing Climate in Canada p	 Inference Research Critical thinking Initigation Goals, cut into strips n? student worksheet Mitigation infographic oster 	

Tip: Check out Natural Resources Canada's new poster, **Adapting to Our Changing Climate in Canada**. It will help students learn more about our changing climate, the impacts it's having, and how Canadians are adapting. Request your copy using the online order form or by calling 1-800-387-2000 (Product # M174-13/2016). Alternatively, you can download the web-accessible version.

What to do

1. Following the **Conceptual Map activity**, write this question on the board:

Why should humans help biodiversity thrive and survive?

- 2. Launch a discussion on the ecological services that nature provides and invite students to put as many examples as possible on the board. Examples may include:
 - Resources such as timber, food, fuel, and bioproducts,

- Ecological processes such as carbon storage, nutrient cycling, water and air purification, erosion control, cooling, shade, pollination, seed dispersal, waste decomposition, and maintenance of wildlife habitat, and
- Social and cultural benefits such as recreation, traditional resource uses, and spirituality.
- 3. Synthesize the benefits of ecological services by proposing that it's in our best interests to do everything we can to help biodiversity thrive and survive in the face of climate change.
- 4. To launch the discussion on adaptation and mitigation, watch the video: Climate change adaptation: It's time for decisions now (GIZ online)-www.youtube.com/watch?v=FO46sPwm4xk.
- 5. On the blackboard or Smart Board, write "Adaptation Measures" (on one side) and "Mitigation Measures" (on the other side).

Brainstorming phase: Ask students if they know what these words mean (synonyms, resemblances) and write their ideas under each heading.

Research phase: Ask students to find two or three words related to these concepts using the Internet or the dictionary.

Validation phase: Synthesize the results and work with students to define the concepts.

6. Provide students with the following examples of adaptation measures and mitigation measures with respect to biodiversity and nature. Work with students to refine their definitions further.

Adaptation measures:

- Plant different types of crops to respond to changing growing seasons and temperatures.
- Research natural alternatives to deter any pests migrating northwards from attacking trees and crops.
- Build alternative physical corridors to help fish migrate when rivers are reduced due to evaporation.

Mitigation measures:

- Increase the amount of food grown locally to reduce the greenhouse gas emissions caused by transporting food over long distances.
- Plant millions of trees to absorb and trap carbon dioxide from the atmosphere.
- Feed cattle seaweed instead of traditional hay and grains to reduce the methane content of cow belching and flatulence.
- 7. As a whole-class activity, ask students to help you classify the **Adaptation and Mitigation Goals** as either "Adaptation" or "Mitigation."
- 8. Hand out the Adaptation or Mitigation? student worksheet.
- 9. Assign two measures per pair of students and ask them to justify whether they fall under "Adaptation" or "Mitigation."
- 10. Ask each pair to join another group to compare answers.
- 11. As a class, decide where each example should be classified and why. Hand out the **Climate Change:** Adaptation and Mitigation infographic to compare answers.

Tip: Your class answers may vary from the **Climate Change: Adaptation and Mitigation** infographic. The important part for assessment purposes is that students are able to justify their choice based on the goals of adaptation and mitigation.

Extension

- Return to the Mind Map activity (p. 16) and ask students to assign adaptations to their consequences.
- Discuss with students: When it comes to adaptation or mitigation, is one more important than the other? Are there some measures that address both at the same time?
- Tap into any first-hand knowledge and make connections to their lives outside the classroom by inviting students to share their stories. Some students may have experienced climate change impacts, large or small (e.g., recurrent flooding; earlier spring smelt runs). They may also have witnessed adaptation measures (e.g., their village may have been relocated; they may go smelt fishing earlier in the season).
- Discuss the implications of assisted migration with respect to the disruption of the receiving ecosystem.
- Talk about whether fishers, like farmers, may be able to adapt their practices to adapt to climate change.
- Discuss whether genetic modification could help some species adapt. Watch the following video as an introduction:

What can genomics do for Canada's forestry sector? (NRCan) www.nrcan.gc.ca/forests/video/17158

• Read the following article and justify whether this is an example of adaptation or mitigation:

P.E.I. farmer assists in near-eradication of methane from cow farts www.cbc.ca/news/canada/prince-edward-island/pei-cow-farting-1.3856202

Activity 3–Teacher BLM: Adaptation and Mitigation Goals

Cut out the goals and work with students to assign each to either adaptation or mitigation.



Improve the ability of animals and plants to thrive under different climate conditions.



Build resilience to extreme weather and climate changes.



Increase the capacity of species to adapt.

Cut down greenhouse gas emissions.



Trap greenhouse gas emissions.

Name: _____

Date: _____

Activity 3–Student BLM: Adaptation or Mitigation?

What type of measure does each example below represent: adaptation or mitigation? Justify your answers.

	Adaptation	Mitigation
Create or increase protected natural areas.		
Connect protected areas by changing the landscape or waterscape to ease migration and movement.		
Physically displace species within their range or move them to a new territory.		
Restore damaged ecosystems.		
Improve access to water.		
Involve citizens in monitoring climate change impacts.		
Invest in research on the biology and ecology of plants and animals.		
Increase sources of renewable energy.		
Improve industrial processes on nearby farms and industries.		
Create community and home gardens for food production and to create habitat.		

Bear in Cage by Gan Khoon Lay from the Noun Project Microscope by Akshar Pathak from the Noun Project Wheat by Aleksandr Vector from the Nound Project