

Time

1-2 periods

Targeted Curriculum Expectations

- explain how human activities affect, or are affected by, the environment
- describe how natural systems influence cultural and economic activities
- explain how selected factors cause change in human and natural systems
- predict the consequences of human activities on natural systems

Background Information

This lesson will help bring meaning to the concepts of climate change impacts, mitigation, and adaptation. It is anticipated that even small shifts in normal climate conditions will have potentially large impact in the Region of Peel including increased amount of extreme weather events. Floods, wind storms, ice storms will have negative effects on the built, natural and human systems in our communities. Addressing the impact of climate change requires two complementary actions: reducing greenhouse gas emissions (mitigation) and reducing harm to living things and their environment (adaptation).

Teaching/Learning Sequence

Whole Class

1. Place the words “Impacts of Climate Change” and “Actions to Combat Climate Change” on the walls on either side of the classroom.
2. Hand out the series of Climate change prompts to pairs of students (TR 2.1). After reading and thinking about the prompt, ask students to justify their reasoning by moving closer to the wall that best fits their prompt.
3. Place a VENN diagram on the board (TR 2.2). Have students with the Actions to combat climate change come up and place it in the VENN either in Mitigation, Adaptation or both. Have students with impact statements decide if these actions would combat their impact statement. Ask student to be prepared to justify why.

Mitigation = Actions to reduce GHG emissions
Adaptation = Actions that reduce harm to living things and their environment.
Middle of VENN= Actions that both mitigate and adapt (mostly actions that involve greening the environment)
 i.e. Planting trees both reduces GHG emissions and is an action to adapt to the impact

Groups of Four – Concept Attainment Chart

Students:

1. Students form groups of four.
2. Follow the instructions on the Concept Attainment Chart (BLM 2.3) BLM 2.4 can be used for students who prefer visual learning styles. Students need to determine the differences and similarities between the factors in Column A (impacts) and the factors in column B (action to mitigate and/or adapt for climate change). Task 2 adds testers to assess knowledge of the concepts. The last task asks students to sort column B using a VENN diagram. Teacher circulates to assist and guide student in their understandings of the concepts.
3. As a class, create definitions for impact, mitigation, adaptation. Post in class room on graffiti for use as an anchor chart.

Consolidation and Connection

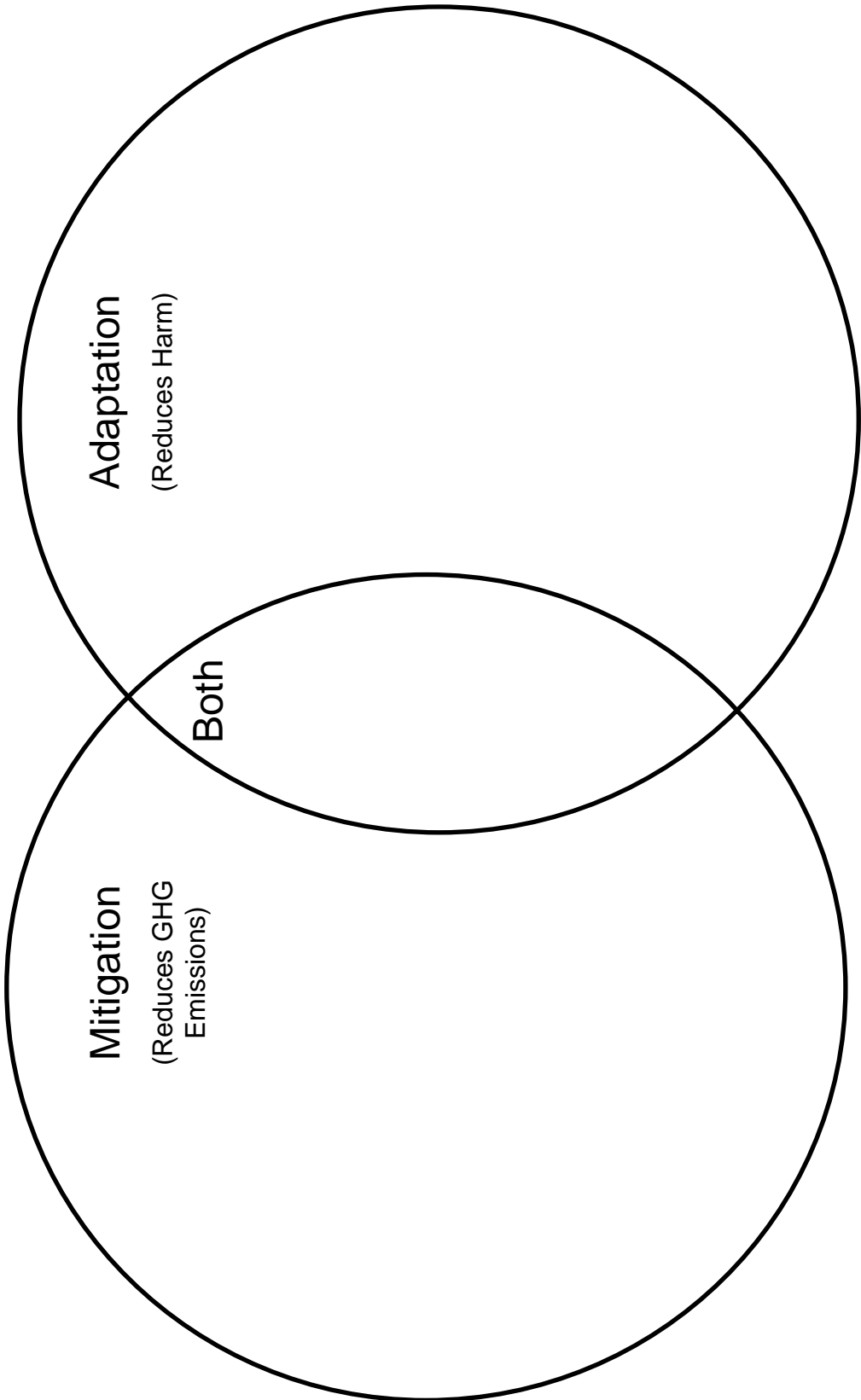
1. Provide an overview and background knowledge to students for completion of BLM 2.3 and 2.4. Students are to individually work through the tasks to build on their understanding of climate change concepts. These assignments will provide students with concrete examples of the impacts of climate change and how we are mitigating and/or adapting to these changes.
2. Observe and assist students as needed.
3. Collect assignments for assessment and to gage student's understanding of the concepts.
4. Assessment criteria for Task 3 of BLM 2.4 need to be developed with the students.



IMPACT, MITIGATION, ADAPTATION PROMPT LINES

1. Intense high wind weather event hits the Region of Peel. Wind storm causes damage to homes and businesses. Roofs and cars are damaged. Clean up costs exceed \$2 million.
2. Increase in seasonal snowfall causes high runoff of snowmelt; resulting in flooding of Cooksville Creek. Basements are flooded.
3. Record heat wave hits the Region of Peel. Power outage occurs due to high demand to power cooling systems.
4. Caledon farmer loses crop due to extreme ice storms; three years in a row.
5. The numbers of Leopard frogs found in the wetland are slowly decreasing.
6. The Region of Peel host a community Tree Planting Day.
7. The City of Brampton upgrades sewers, culverts and overland flow routes for extreme rainfall
8. The City of Mississauga expands the transit system
9. The Region of Peel builds more biking and walking paths. A new website includes an interactive map that will allow cyclists and walkers to plan their trips.
10. A new recycling plant is built and it is heated and cooled by ground source heat pumps (no direct use of fossil fuels)
11. A Solar Thermal Hot Water system is installed at Regional Child Care Centres.
12. There are Indoor recreation programs offered on extreme heat days.
13. Two children's splash pads are built in the Region.
14. One hectare of forest land is donated to the Region of Peel. The land will be protected as parkland.
15. Drive-thrus are no longer permitted in the Downtown areas of Brampton.
16. Cooler uniforms are given to staff working outside in the summer.

VENN DIAGRAM





	A	B
1	Extreme ice storm hits city and damages 500 trees.	The students plant 500 trees in Mississauga.
2	Insect infestation causes damage to farmers crops.	No idle-zones are designated in Brampton
3	Flooding causes six families to relocate.	Solar power lights are installed in new bus shelters
4		
5		
6		
7		
8		
9		
10		

Task One:**Compare and Contrast:**

Examine the first pair of A and B statements. How are they different?

Examine the second pair of A and B statements. How are they different?

How are all A statements the same? How are all B statements the same?

Task Two:**Testers:**

In which column does each of the following statements belong – Column A or Column B?

- Mateo cannot afford his electricity bill because energy prices have increased
- Kim buys a hybrid car.
- Heat alert days increase
- Overtime, the stream water is warming and there is an increase in fish mortality rates.
- Sigrid goes to the hospital with heat stroke.
- The local library is being used as a “Cooling Centre” during prolonged heat waves.
- The school plants trees in the school yard
- Tim turns of the lights every time he leaves a room
- Jamal rides his bike to see his friends at the park
- Wind storm causes damage to ten houses in Mississauga
- Create 2 of your own testers; place them in the right column.

Task Three: Draw a VENN diagram. Sort column B into 2 or more categories.



Climate Change

Study the pictures. What do the pictures in column A have in common? What characteristics do the pictures in column A share? What do the pictures in column B have in common? What characteristics do the pictures in column B share?

A	B
	
	
	
	

Name: _____

Task 1: Examine the scenario below. Identify the climate change impact, and the adaptation or mitigation actions that took place. Explain why they are actions of mitigation and/or adaptation.

Scenario 1: Due to extreme ice storms over the past month, a 70 year old woman is unable to purchase groceries. She calls a local food bank organization to deliver her food to her apartment.	
Impacts:	Why is this a climate change impact?
How was the impact Adapted and/or Mitigated:	Why is this action considered to be a mitigation or an adaptation to climate change?

Scenario 2: Increased temperatures over time in Caledon has lengthened the growing season for the farmer. The farmer has calculated that the crop can be grown twice during the season. This will double his farming profits.	
Impacts:	Why is this an impact?
Adaptation/Mitigation or both:	Why is this action considered to be a mitigation or an adaptation to climate change?

Task Two:

Create your own Climate Change Scenario that includes an impact and a response to mitigate and/or adapt to the situation. Explain your thinking. If necessary, you may use resources such as the reading from Lesson 1 or the Internet.

Consider one or more of the following impacts of climate change: health, environment, built structure, or agriculture.

Assignment 2

Task One:

Read the statement below. Underline the impacts and circle how the situation has been mitigated and/or adapted (Place an A for Adaptation; M for mitigation or B for both Mitigation/Adaptation above the circle)

1. A local farmer has less crop production due to increased temperatures during the last ten years in the Region. The farmer decides to grow a different type of crop that can withstand warmer temperatures.
2. There are more frequent power failures in the Region due to a high demand for cooling systems. A family needs power to run their business. They install solar panels on the roof of their house.
3. Extreme flood causes erosion on the side of the stream, 50 trees are damaged. A kids camp plants 100 trees along the Credit River.
4. A heat wave hits the Region. Dara and her friends decide to go to an air-conditioned indoor skateboard park.

Task Two:

Using an on-line news portal or a newspaper, find two articles about climate change that contains information on impacts and how the situation is being mitigated and/or adapted to climate change. Highlight or underline the passages of the article that contain the impact, the mitigation and/or adaptations. Explain why it is important to mitigate or adapt to climate change.

Task Three:

Create your own news flash article that talks about how we can take action to combat climate change.

Due Date: _____