

# Educator's Guide



## Eco 360

---

**Activity 13: Circular Economy, Sustainability and Climate Action**  
[greenlearning.ca](https://greenlearning.ca)  
*Copyright © 2022 GreenLearning Canada Foundation.*  
*All Rights Reserved.*

# Table of Contents

---

1. **Backgrounder**
2. **Curriculum Connections**
3. **Activity Number and Title**
  - a. **Overall Objective**
  - b. **Materials**
  - c. **Time Required**
  - d. **Learning Outcomes**
  - e. **Grade Level**
4. **Activity Outline**
  - a. **Steps Involved**
  - b. **Learner Assessment**

## Backgrounder: Plastics and Anthropomorphic Climate Change

---

The pollution problem of plastic is obvious and most talked about. To date, 6.3 billion tons of plastic waste has been produced in the world, polluting marine environment, land and air. A high proportion of plastic waste is composed of single-use plastics which are discarded after one use, which poses additional challenges of efficient land use due to the need for more and more landfills. However, there is also another consequence of plastic—exacerbating anthropomorphic climate change, i.e., climate change attributed to human activity that has led to an increase in greenhouse gas emissions in the earth's atmosphere. Refer to GreenLearning's Decoding Carbon program activity below for more information:

<http://www.greenlearning.ca/decodingcarbon/how-is-climate-change-shaping-this-world.php>

Plastic is made from fossil fuel and fossil fuel extraction results in greenhouse gas emissions. Plastic production, therefore, results in greenhouse gas emissions. Plastic is also incinerated in many parts of the world, which adds to GHG emissions. Increase in GHG emissions adds to climate change, with global earth temperatures continually rising. Scientists predict severe adverse environmental impacts of anthropomorphic climate change if the temperature of the earth rises beyond 1.5 degrees Celsius. In order to act together to limit temperature rise, 196 world countries came together in 2016 to sign on to the Paris Climate Agreement, which is a legally binding international treaty on combating climate change (UNFCCC, 2021). The main goal of the agreement is to limit global warming to well below 2 degrees Celsius, and preferably to 1.5 degrees Celsius, compared to pre-industrial levels (UNFCCC, 2021).

As plastic production and incineration results in GHG emissions, addressing plastic production is important to keep the temperature of the earth from rising beyond 1.5 degree Celsius. To-date, almost 8.3 billion metric tons of non-recyclable plastic has been produced in the world (National Geographic Society, 2019). In 2019, it is estimated that the production and incineration of plastic produced more than 850 million metric tons of GHG emissions, which is equivalent to 185 500MW coal power plants (Center for International Environmental Law, 2019).

If plastic continues to be produced at given rates, then by 2030 the GHG emissions from plastic production can reach almost 1.34 billion tons per year, and that is equivalent to emissions arising from constructing almost 295 new coal-fired power plants each generating 500MW of electricity (Center for International Environmental Law, 2019).

Therefore, climate action requires eliminating plastic pollution and more importantly, its production. Moving towards a circular economy for plastics will not only address plastic pollution but also help reach climate action goals.

For more reading on impacts of plastic industry on climate change, we highly recommend the following:

- Report from the Center for International Environmental Law <https://www.ciel.org/wp-content/uploads/2019/05/Plastic-and-Climate-FINAL-2019.pdf>
- Paris climate agreement: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

## Bibliography

Center for International Environmental Law. (2019). *Plastic & Climate: The Hidden Costs of a Plastic Planet*. Center for International Environmental Law.

National Geographic Society. (2019). *A Whopping 91 Percent of Plastic Isn't Recycled* .

Retrieved from National Geographic:

<https://www.nationalgeographic.org/article/whopping-91-percent-plastic-isnt-recycled/>

UNFCCC. (2021). *The Paris Agreement* . Retrieved from UNFCCC: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

# Curriculum Connections

---

## Activity 13: Circular Economy, Sustainability and Climate Action

### Alberta

- ❖ Biology 30 Unit D: Population & Community Dynamics
  - 30-D2.1sts explain why Canadian society supports scientific research and technological development to facilitate a sustainable society, economy and environment
- ❖ Social 10-1
  - 3.7 explore multiple perspectives regarding the relationship among people, the land and globalization (spirituality, stewardship, sustainability, resource development)

### Ontario

- ❖ Grade 9 Geography
  - C1. The Sustainability of Resources: analyze impacts of resource policy, resource management, and consumer choices on resource sustainability in Canada
- ❖ Grade 9 Bio (B1.2, B2.3, B2.4, B3.5)
- ❖ Grade 10 Bio (B1.3)

# Activity 13: Circular Economy, Sustainability and Climate Action

---

## Overall Objective

Learners will learn about the United Nations' Sustainable Development Goals. Learners will explore how a circular economy for plastics fits within the climate action goals of a country.

## Materials

- Internet-enabled device
- Topic backgrounder
- Eco 360 notebook (we recommend asking learners to maintain a notebook for this program to write down reflections as they go through the program)
- [Report: Clean Canada: Protecting the Environment and Growing our Economy](#)

## Time Required

75 minutes - 90 minutes

## Learning Outcomes

By the end of this activity, learners will:

- identify and describe United Nations' Sustainable Development Goals
- understand how a circular economy for plastics should be an important aspect of a country's climate action goals
- understand Canada's climate action goals and strategy for tackling plastic waste

## Grade Level

Suitable for Grades 9 to 12

## Activity Outline

---

### Step One

Begin by introducing the learners to the United Nations' Sustainable Development Goals. Spend time on goal # 12 - Responsible Consumption and Production - that focuses on reducing plastic waste in the environment:

- a. UN Sustainable Development Goals: <https://sdgs.un.org/goals>
- b. Goal # 12 - Responsible Consumption and Production:  
<https://sdgs.un.org/goals/goal12>
  - i. Have learners explore the "Overview", "Targets and Indicators" and "Progress and Info" tabs. Ask learners to take notes in their Eco 360 notebooks.

### Step Two

Continue by exploring how plastic pollution is connected to climate change.

- a. Using the backgrounder, explain to learners how greenhouse gas emissions from plastic lifecycle poses a challenge to keep the temperature of the earth from rising beyond 1.5 degree Celsius. Besides adding emissions to the environment, the plastic waste pollution ending up in the environment has severe adverse impacts.

### Step Three

Now that learners have a good understanding of the connection of plastic pollution to climate change and sustainable development goals, dive into Canada's climate action goals, and how tackling plastic pollution is addressed there.

- a. In groups, learners will answer the following questions as they read the [Report: Clean Canada: Protecting the Environment and Growing our Economy](#).
  - i. How is the plastic policy connected to United Nations' Sustainable Development goals?
  - ii. How does eliminating plastic pollution help in fighting climate change?

- b. Learners may also review the following additional resources for this research:
- i. 'Government of Canada taking action to reduce plastic pollution' <https://pm.gc.ca/en/news/backgrounders/2019/06/10/government-canada-taking-action-reduce-plastic-pollution>
  - ii. 'Canada to ban harmful single-use plastics and hold companies responsible for plastic waste' <https://pm.gc.ca/en/news/news-releases/2019/06/10/canada-ban-harmful-single-use-plastics-and-hold-companies-responsible>



## Learner Assessment

Consolidation: After reading the case study, discuss the following questions as a class. Learners can record their answers in their Eco 360 notebooks:

- a. What is the importance of national policy solutions towards tackling plastic pollution, given waste management is a shared responsibility across all levels of government?
- b. Are national policy solutions more important than individual action? Why or why not?
- c. Are there any challenges in implementing Canada's zero plastic waste policy?
- d. How can we hold our governments at all levels accountable for eliminating plastic waste?