



CREDIT VALLEY  
CONSERVATION

# *Food, Farming, and Climate Change*



*Climate Change Solutions  
for the Credit River*

*Teacher Guide*

# Overview

How does climate change affect your food? Watch a video to learn how climate change affects farms and what farmers in your area are doing about it. Research different farming techniques, and learn how agriculture can affect climate change in both positive and negative ways.

## Contents

I. Learning Objectives.....	1
II. Teacher Background and Vocabulary.....	1
III. Before Viewing the Video .....	3
IV. Viewing Guide.....	3
V. Activity Guide .....	4
VI. Evaluation and Suggestions for Extended Learning .....	6
VII. Curriculum Connections .....	6

## I. Learning Objectives

Students will realize that climate change is not only happening in the arctic or coastal communities but where they live as well. Students will learn that there are actions that they can take to help with climate change mitigation and adaptation locally.

*Learning Objectives:*

1. Food production is associated to soil health
2. Weather associated with climate change affects soil productivity
3. You can make a difference with your food purchases

## II. Teacher Background

### ***Climate Change and Conservation in our watershed***

Instead of working inside a political boundary (within city or provincial limits), CVC works within a *watershed* boundary. A watershed is an area of land that drains into a river - we live in the Credit River watershed. CVC is responsible for the land and water that surrounds the Credit River, including areas of Mississauga, Brampton, Georgetown, Caledon and Orangeville.

A major focus of CVC is to help the river and communities surrounding it prepare for climate change.

**Vocabulary:**

1. **Watershed:** area of land that drains into a river.
2. **Erosion:** movement of soil off of farmland due to forces such as water and wind.

### III. *Before Viewing this Video*

This video is meant to be watched after students have a basic understanding of climate change and global warming.

---

## IV. *Student Activities*

**Materials**

## Activity 1:

- Climate Change on the Farm Video
- Computer and projector (if showing video in class)
- Student Activity Guide

## Activity 2:

- Student Activity Guide
- Example Farming and Climate Change Article
- Library or computer lab to conduct research
- Presentation materials

### *Instructions for Activity # 1:* (To be completed by students at home or in class)

Watch '[Climate Change on the Farm](http://www.creditvalleyca.ca/farmingvideo)' and answer the viewing guide questions

Students may either watch the video at home prior to doing the in-class activity or the video can be watched together as a class. Provide the students with the link to the video (<http://www.creditvalleyca.ca/farmingvideo>) and the Viewing Guide Questions from Activity #1 in the Student Guide. The students will answer the questions while watching the video.

**Answer Sheet for Activity # 1: Viewing Guide Questions:**

1. Why is farming important?
  - Farming provides the food, fibre and fuel that we all need to survive.

2. How is climate change affecting farms in our area?
  - Floods and droughts affect crop survival
  - Storms erode topsoil
  - High winds can erode topsoil or batter crops
3. Three things are being done at Whole Village to mitigate or adapt the farm to climate change. What are they and how do they either help the farm mitigate or adapt to climate change?
  - Collecting water from the barn roof helps prevent taking water from ponds and streams, collecting and saving water helps the farm adapt during drought periods.
  - Planting windbreaks helps prevent wind from blowing across the fields and robbing them of moisture, helps the farm adapt to drought periods and also blocks the wind.
  - Planting cover crops prevents weeds from growing and mitigates climate change by storing carbon in the soil.

---

## ***Instructions for Activity # 2:*** (To be done in class)

### **How Farming Affects Climate Change**

1. **Review** video viewing guide questions in small groups (2 to 4 students). Using shared information from the discussion, students may rewrite their answers to hand in.
2. **Tell the students:**

“We are going to learn about various farms and farm technologies and how they either contribute to climate change or help to mitigate it.”
3. **Have students read** the instructions for Activity 2 in the Student Guide (see Appendix 1). **This can be done individually, in small groups or out loud for the class.**
4. **Divide the students into groups (if they haven’t been already).**
4. When students are done reading the background information, they may **start the activity** – *Choose a topic related to farms, farming techniques or farm technology and prepare a presentation for the class to teach them about your topic and how it either contributes to or helps mitigate climate change.*
5. The class will **present what they’ve learned** to the rest of the class.

## Potential Topics for Presentations

Students can do research to find topics, or here are some ideas:

- Types of farms: large-scale farming operations such as factory farms and cash crops, large- and small-scale organic farms and permaculture gardens.
- Techniques could include things like biodynamic farming, crop rotation, cover cropping, composting and regenerative grazing.
- Technologies could be the evolution of farm machinery, the genetic engineering of crops or the development of new organic pesticides.

An Example Article can be downloaded from this site  
<https://www.patagoniaprovisions.com/pages/buffalo-conservation>  
 about the effect of a farming technique on climate change.

## vi. Evaluation

1. Students hand in Viewing Guide questions and participate in discussions.
2. Students prepare and present a topic related to farming and climate change.

*Suggestions for extended learning:*

1. The carbon footprint of your lunch:
  1. Pick a food item (pizza, hamburger or soup) that you would typically find at a school cafeteria or in your lunch box.
  2. Create a flow diagram to show the carbon footprint of the food (or each item in the food) over the entire life-cycle of the food from production, to consumption and disposal.
  3. Try to include all inputs and outputs at all stages. It is not necessary to find exact weights for carbon emissions at each stage. Simply indicate all the points where emissions are created with arrows.
2. Calculating food miles:
  1. Plan a meal, go to a grocery store (or “shop” online) for the items and identify where each food item comes from.
  2. Calculate how many “food miles” the meal costs. (How far each item had to travel to get to the grocery store).
  3. Visit a farmer’s market in your area
4. Plan a visit with your class to Whole Village farm in Caledon, Ontario. Contact Brenda Dolling at [bdolling@wholevillage.org](mailto:bdolling@wholevillage.org) to book your trip.

## vii. Curriculum Connections

### **D. Earth and Space Science: Climate Change**

D1.1 - Analyse current and/or potential effects, both positive and negative, of climate change on human activity and natural systems (e.g. loss of habitat for Arctic mammals such as polar bears and loss of traditional lifestyles for Inuit as Arctic ice shrinks; famine as arable land is lost to

desertification; an increase in water-borne disease and human resettlement as coastal lands are flooded; and expansion of the growing season in some regions).

D1.2 - Assess, on the basis of research, the effectiveness of some current individual, regional, national or international initiatives that address the issue of climate change (e.g. community tree-planting programs) and propose a further course of action related to one of these initiatives.

D2.1 - Use appropriate terminology related to climate change, including, but not limited to albedo, anthropogenic, atmosphere, cycles, heat sinks and hydrosphere [C].

D2.3 - Analyse different sources of scientific data (e.g. lake cores, tree rings, fossils and preserved organisms and ice cores) for evidence of natural climate change and climate change influenced by human activity.

D3.8 - Identify and describe indicators of global climate change (e.g. changes in glacial and polar ice, sea levels, wind patterns and global carbon budget assessments).

### **A. Scientific Investigation Skills and Career Exploration**

A1.1 - Formulate scientific questions about observed relationships, ideas, problems, and/or issues, make predictions, and/or formulate hypotheses to focus inquiries or research.

A1.5 - Conduct inquiries, controlling some variables, adapting or extending procedures as required, and using standard equipment and materials safely, accurately and effectively to collect observations and data.

A1.7 - Select, organize and record relevant information on research topics from various sources, including electronic, print and/or human sources (e.g. websites for public health organizations, federal and provincial government publications, reference books, personal interviews), using recommended formats and an accepted form of academic documentation.

A1.8 - Analyse and interpret qualitative and/or quantitative data to determine whether the evidence supports or refutes the initial prediction or hypothesis, identifying possible sources of error, bias or uncertainty.

A1.10 - Draw conclusions based on inquiry results and research findings and justify their conclusions.

A1.11 - Communicate ideas, plans, procedures, results and conclusions orally, in writing and/or in electronic presentations, using appropriate language and a variety of formats (e.g. data tables, laboratory reports, presentations, debates, simulations and models).

A1.12 - Use appropriate numeric, symbolic and graphic modes of representation and appropriate units of measurement (e.g. SI and imperial units).

A2.1 – Identify and describe a variety of careers related to the fields of science under study (e.g. meteorologist, medical illustrator, geochemist and optical physicist) and the education and training necessary for these careers.

**Appendix 1: Information for student Activity # 2 (from the student guide)****Activity # 2 - How Farms Affect Climate Change**

As mentioned in the video we all rely on agriculture for food, clothing and energy. Different types of agriculture affect the environment in different ways. Some types of agricultural practices can help mitigate climate change, while others contribute to climate change through carbon emissions.

For this activity you will research different types of farms, farming techniques or farm technologies and describe their impact on climate change. For example there are large-scale farming operations such as factory farms and cash crops, large-and small-scale organic farms, and permaculture gardens. Techniques could include things like biodynamic farming, crop rotation, cover cropping, composting and regenerative grazing. Some examples of technologies could be the evolution of farm machinery, the genetic engineering of crops or the development of new organic pesticides. Choose a topic that is of interest to your group.

Research your topic of interest at the library or online and then use what you learned to make a presentation to your class. During your presentation you should cover the following:

What type of farm, farming technique or technology did you research? Describe the farm, technique or technology.

What does the farm produce? (food - animal or vegetable, fuel, or fibre for clothing, paper etc) or what type of crop(s) is the technology used for?

In what way does this type of farming (or farm technology) either contribute to or mitigate climate change?

