

Ag *for* Life



**AGRICULTURE &  
THE ENVIRONMENT**  
AIR QUALITY

# Curriculum Connections



## Science Grade 5: Outcomes



### Science Grade 5: Outcomes

Conservation agriculture is a sustainable practice that responds to local climate and weather events.

Climate and weather events may influence agricultural practices by affecting components such as

- crop type
- crop production
- animal population
- soil quality
- water access

Conservation agriculture practices are adapted to the requirements of plants and animals farmed.

Agricultural practices involve monitoring and responding to climate or weather.

Conservation agriculture practices include :

- minimizing soil disturbance
- maintaining soil cover
- using water efficiently
- using sustainable harvesting practices

Sustainable harvesting practices support the maintenance of stable plant or animal populations over time and include :

- crop rotation
- companion planting
- limiting hunting and trapping
- considering future harvests





# Curriculum Connections



## Science Grade 7: Outcomes

### Science Grade 7: Outcomes

#### Unit A: Interactions and Ecosystems (Social and Environmental Emphasis)

**Overview:** Ecosystems develop and are maintained by natural processes and are affected by human action. To foster an understanding of ecosystems, this unit develops student awareness of ecosystem components and interactions, as well as natural cycles and processes of change. Building on this knowledge, students investigate human impacts and engage in studies that involve environmental monitoring and research. By reflecting on their findings, students become aware of the intended and unintended consequences of human activity, and recognize the need for responsible decision making and action.

#### Unit B: Plants for Food and Fibre (Science and Technology Emphasis)

**Overview:** Humans have always depended on plants as a source of food and fibre, and to meet a variety of other needs. To better meet these needs, technologies have been developed for selecting and breeding productive plant varieties and for maximizing their growth by modifying growing environments. Long-term sustainability requires an awareness of the practices humans use and an examination of the impacts of these practices on the larger environment.





## AIR QUALITY AND AGRICULTURE

Air pollution has been a large problem for decades and has had a serious impact on both the environment and our population's health.. There are lots of pollutants in the air that we breathe. Some of these pollutants come from natural sources but the majority comes from human activity. Air pollutants can be found everywhere (indoors and outdoors), and can include fibres, mists, bacteria and gases.

Part of air pollution is known as particle pollution. Particle pollution is made up of tiny particles (tiny pieces) of solids or liquids that are in our air. You can actually see some of these particles, for example, when you see smoke in the air.

### Did You Know?

Did you know that agricultural crops can be injured when they are exposed to high amounts of air pollutants? Injuries to plants can include visible markings on the foliage, reduced growth and yield, and even premature death. These injuries can show up quickly, as dead spots on the plant-, or slowly, as a yellowing of the leaves.





Particle pollution, like cement dust, magnesium–lime dust, or carbon soot (fine black soot from carbon combustion), that lands on plants, restricts the ability of photosynthesis in those plants (if the plant surface is covered it cannot utilize the sunlight to its full potential). Likewise, the accumulation of alkaline dusts in the soil can increase soil pH to levels that are harmful to crop growth. Fertilizer efficiency is also decreased in those areas exposed to high levels of air pollutants due to the plants ability being restricted to properly use sunlight, water and carbon dioxide. This results in the disruption of food production and access.

### What is Agriculture’s Role in Air Quality?

We all have a part to play in reducing air pollution and improving air quality. Farmers have adopted sustainable practices to protect air quality and the environment. For example, some farmers plant trees and install raised landforms to reduce wind speed. Planting trees as a buffer reduces the impact of odors and dust. Gravel can also be used to reduce dust. Farmers even have effective nutrient, waste and manure management systems that improve air quality and preserve our environment.



# Air Quality Activity:

## Materials:

Index card, pencil, quarter, scissors, hole punch, string, clear packing tape, permanent marker, magnifying glass or microscope AND various materials for controlling dust.



## Procedure:

1. Read the background information on air quality.
2. Place a quarter in the centre of an index card. Use a pencil to trace around the quarter. Repeat this process on both the left and right side of the centre circle to create three circles spaced equally apart. Use scissors to cut out each circle without damaging the card.
3. Use a hole punch to put a small hole in one end of the index card. Tie a string through the hole. The string will be used to hang the card at a selected monitoring site.
4. Put a long piece of clear packing tape over the quarter holes on one side of the index card. Be sure to completely cover all three holes. The sticky side of the tape will show through the hole and be used to collect dust. Do not touch the exposed sticky surface.
5. Before hanging the index card at a selected site, use a permanent marker to write your name, date and site location at the top of the strip.
6. Brainstorm with your class to identify different monitoring locations in your environment, both inside and outside. Use a piece of tape to secure the index card by its string to a stable surface at your chosen site. The index card should be able to move freely without contacting other objects and not be easily reached by others.
7. After one week, collect your index card. Use a magnifying glass to observe particles and record observations in your science journal. You may be able to identify different particles, such as dust, ash or pollen.
8. Collaborate with your colleagues to place the index cards in ascending order, from the least amount of dust to the most amount of dust. Identify the locations with the greatest prevalence of dust.
9. Work in small groups to create a strategy to reduce the dust in a specific area. Gather necessary materials and implement your strategy. After one week, collect your index card. Use a magnifying glass to observe particles and record observations in your science journal. Did your strategy reduce the dust?
10. Share your findings with your class. Identify the area, control techniques and pre- and post-intervention results. Explain how you could apply your strategy to a different setting or scale.





## Adapted from the following sources:

Adapted from the following sources:

Copyright 2018 American Farm Bureau Foundation for Agriculture® 1  
Educator's Guide · Agriculture and the Environment

Biodiversity Conservation Guide for Farmers and Ranchers in Alberta  
Copyright © 2007, Alberta Agriculture and Food

Effects of Air Pollution on Agricultural Crops. Ontario Ministry of the Environment, Conservation and Parks. Copyright September 2022.

Agricultural producers care deeply about the land they live on. For many producers, caring for their land is their most important job.

# References

---

Effects of Air Pollution on Agricultural Crops. Ontario Ministry of the Environment, Conservation and Parks. Copyright September 2022.

<https://www.ontario.ca/page/effects-air-pollution-agricultural-crops>

Agricultural Outlook: How Limiting Air Pollution Will Protect Farms. Copyright June 2019. EIT Food.

<https://www.eitfood.eu/blog/agricultural-outlook-how-limiting-air-pollution-will-protect-farms>





This resource was made possible through the generous support of TD Friends of the Environment.



**TD Friends of the  
Environment  
Foundation**