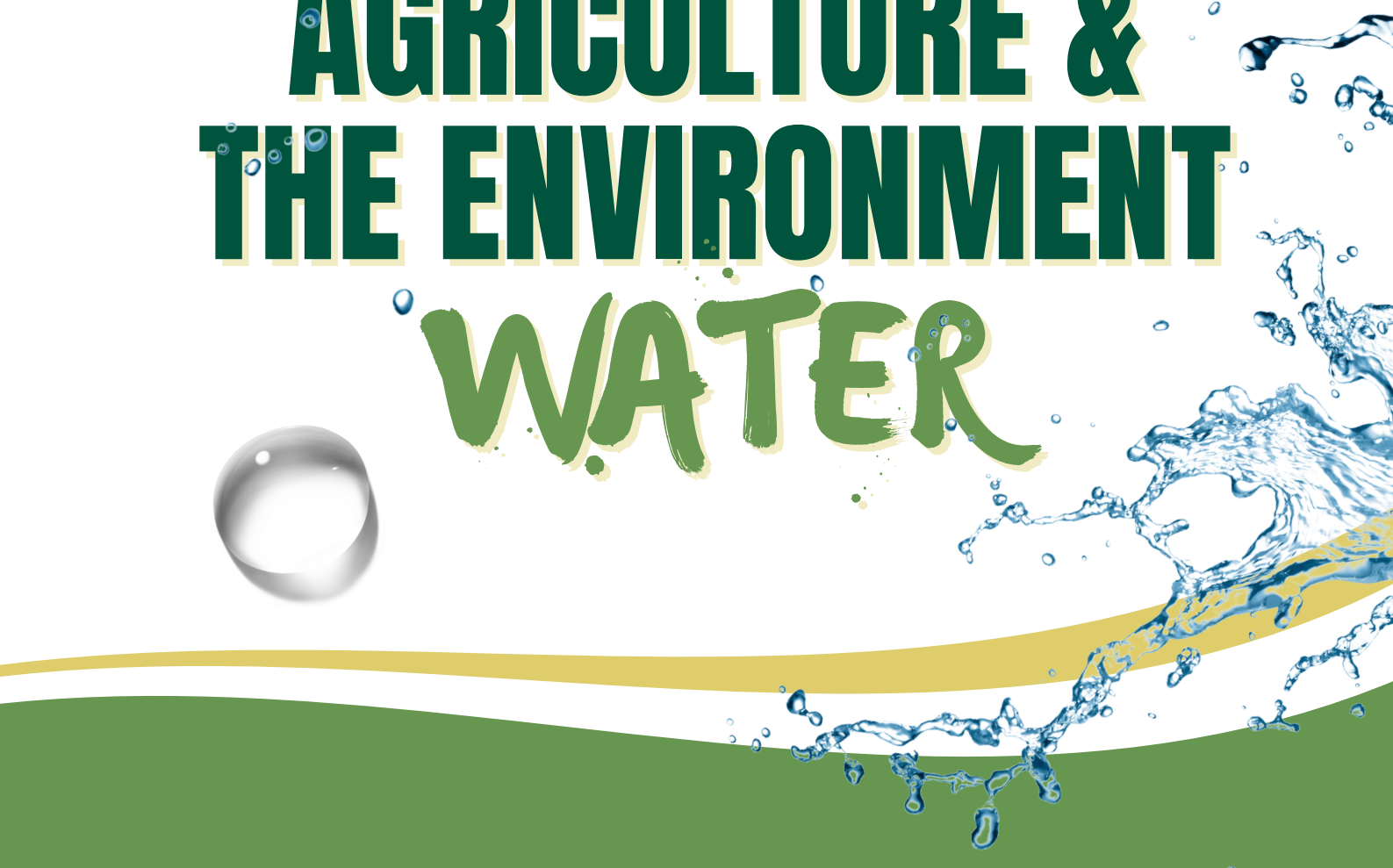
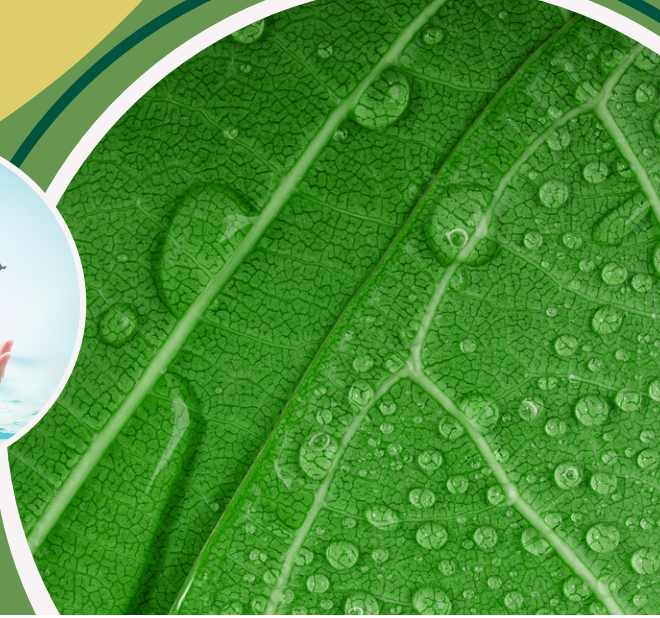




# AGRICULTURE & THE ENVIRONMENT WATER



# 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

### **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.*





# WATER AND AGRICULTURE

Over two-thirds of the Earth's surface is covered by water. The human body is 75 per cent water. Water is one of the most vital resources for life on Earth. Farmers have a vital role in protecting water quality.

As with any resource, pollution can be a major problem. Water pollution is no different. There are many different types and sources of pollutants. When rain or melted snow move over the ground, they pick up and carry away pollutants, which end up in waterways. Agriculture works to prevent this with conservation techniques. But even with preventative measures, water can still become polluted. So, it is important for farmers to do water quality tests. It is also important to understand the importance of water filtration. Filtration is the use of a physical barrier or a chemical and/or biological process that removes the impurities from the water. Just as many people use filtration systems in their homes for their drinking water, farmers use filters to remove pathogens that can cause viruses and sediment that can damage irrigation systems, plants or animals. Your local municipal water treatment plants use filters to remove dissolved particles like dust, parasites, bacteria, viruses and chemicals.



## How Does Agriculture Protect Our Water Quality and Wetland Areas?

Farmers play a pivotal role in protecting water quality and preserving wetland areas. They invest in practices that are sustainable and at the same time improve the area in which they operate. For example, grassed waterways are used as a way of repurposing marginal lands to improve filtration of runoff and reduce erosion from farmland. It also has the added benefit of creating a riparian habitat.

Other ways that farms are improving water quality and wetlands:

- Integrated pest management solutions that reduce the need for pesticides, while practices such as zero-till can reduce pollutant loads entering waterways, as zero-till prevents leaching the pollutants.
- Parts of a wetland or waterway can be fenced off to prevent access by livestock, either permanently or at certain times of the year. Alternative stock watering sites, like troughs, can be used instead. This allows for buffer zones around the water area and preserves sensitive vegetation and wildlife. This in turn benefits the farmers through reduced soil erosion and improved water quality, both within the wetland and downstream.
- Planting drought-resistant and stress-tolerant crop varieties reduce the need to use water from wetlands and other sources.. Farmers can also reduce water usage by utilizing wastewater and implementing a more efficient irrigation system, if such a system is used on the farm.
- Other conservation activities include planting trees and shelterbelts (reducing erosion and increasing biodiversity), installing nest boxes, allowing the wetlands to undergo natural wet and dry cycles and reducing disturbance of the land (furthering the development and protection of wetlands).



# Water Activity #1:

## Materials:

- clear disposable plastic cups (three per group)
- food colouring
- almond extract
- pin
- clean (sterile) sand
- aquarium charcoal
- clean gravel
- coffee filter
- water
- litter



## Procedure:

1. Read the background information on water quality.
2. In this scientific simulation, you oversee water quality for your community's water system. Residents have complained that the water looks and smells "funny." Using the materials provided, supply the community with quality drinking water and assure them it is safe to drink.
3. Use a pin to poke six small holes in the bottom of one plastic cup. This cup will hold your filtration system.
4. Fill the second plastic cup with water. This cup will act as the water source. Add a few drops of food colouring and almond extract, which represent the pollutants. Set this cup aside.
5. Fill the first cup with a filtration material (sand, litter, gravel, coffee filter or charcoal) to test how well it cleans the water sample.
6. The third cup will be used to collect the clean water sample after filtration.
7. When you are ready, hold the filtration system cup over the collection cup. Carefully pour water from the source cup into the filtration system. Evaluate the water collected and record your observations in the table provided.
8. Repeat this process (steps 4-7) using each filtration material. Finally, create a unique combination of filtration materials to maximize effectiveness. Record observations.

Filter Material	Visual Observations	Odor Observations
Sand		
Charcoal		
Gravel		
Coffee filter		
My unique combination		

Present your claims and findings in a one-minute public service announcement that assures citizens their water is safe to drink. Speak clearly and include facts and details. Make a recording to share with the class or present a live version.

Reflect on these questions:

- How did you decide if the water was or was not clean?
- What other tests might be necessary to assure water quality and safety?
- How do communities use filtration methods to preserve water quality?
- How do farmers use filtration methods to preserve water quality?





## 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**

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



# References

---

Wetland and Agriculture. 2016. Department of the Environment. Australian Government.  
<https://www.dcceew.gov.au/water/wetlands/publications/factsheet-wetlands-agriculture>

Water Matters for Sustainable Agriculture. April 2004. Crop Life International.  
[https://croplife.org/wp-content/uploads/pdf\\_files/Water-Matters-for-Sustainable-Agriculture.pdf](https://croplife.org/wp-content/uploads/pdf_files/Water-Matters-for-Sustainable-Agriculture.pdf)

Water Activity Retrieved From:  
[https://www.agfoundation.org/files/Ag\\_the\\_Environment\\_FINAL.pdf](https://www.agfoundation.org/files/Ag_the_Environment_FINAL.pdf)



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



**TD Friends of the  
Environment  
Foundation**

