

# Life of a Tomato

Grade 3-6

## Objective

To compare the environmental impacts of buying a tomato grown at a large-scale farm in Mexico to a tomato grown at an aquaponics farm in Hamilton. Students will be able to compare the amount of water, chemicals and transportation energy used in each method of tomato growing.

## Materials

- Two tomatoes; one (1) red, one (1) green
- 15 character cards for traditional agriculture
- 2 character cards for aquaponics
- Character card reference sheet for leader

**Advanced Preparation:** Print Life of a Tomato cards double sided onto cardstock or other heavy stock paper. Print enough cards of each style to work with the group size. Cut along outline to create cards.

## Introduction

*“Put up your hand if you have ever had pizza, pasta with sauce, a hamburger with tomatoes, or a salad with tomatoes in it? Congratulations that means all/almost all of us eat tomatoes! Tomatoes are a healthy, delicious food that we use in all sorts of ways. Have you ever wondered what happens to tomatoes before they get to your house? When farmers grow any kind of food they use resources. What kind of resources do we use to grow food?”*

Take some answers

*“That’s right traditional farmers need energy, water, land, and chemicals to grow food. Now think about aquaponics farmers; what resources do they need to grow food?”*

Take some answers

*That’s right, they also need energy, water and land (but no chemicals). Let’s look at the life of a tomato to see which type of farming uses less resources, traditional or aquaponics!*

## Activity

1. Divide the students into 2 groups. The first group has two (2) students, and the second group has the remainder of the students. Have each group form a line facing each other.  
*“On this side of the room (indicate long line) we are going to see what happens in the life of a tomato that grows in a traditional farm. On this side of the room (indicate short line) we are going to see what happens in the life of a tomato that grows at an aquaponics farm. Remember, we want to pay attention to what resources we are using, and which system is more sustainable”*
2. Hand out the character cards to the traditional farming line:
  - Hand out cards #1-3 at the beginning of the line
  - Hand out cards #4-6 at the end of the line
  - Hand out Truck Driver cards to the remaining students.

*“Good, now everyone has a role to play in the life of a tomato. Take a moment to read your cards silently to yourself.... Everyone ready? Let’s start the life of this tomato!”*

3. Start with the traditional farming line: have students take turn reading their character card out loud and passing the red or green tomato.
4. When the tomato reaches the end of the long line, collect the tomato.  
*“That was quite a journey! Tell me what type of resources our one little tomato used in its journey to the grocery store? (take answers, prompt if necessary). Wow, that tomato used a lot of resources to get from Mexico to my spaghetti sauce. Let’s see what happens in the life of a tomato coming from an aquaponics farm. Remember, pay attention to resources being used!”*
5. Hand out the two aquaponics character cards to the students in the short line.
6. Give the first students the red tomato and have them read their cards and pass the tomato.
7. When they are done collect the tomato.  
*“That was quick! What type of resources did our aquaponics tomato use? (take answers)”*
8. Collect the remaining cards.

## Discussion

*“Good job everyone! Now that we’ve seen our tomato travel through the traditional agriculture system, and an aquaponics system, which system uses less resources?”*

Take answers.

*“That’s right, local aquaponics has many environmental benefits: uses much less water, can farm all year around on land that is not able to grow plants (i.e. old warehouse, basements, greenhouse on contaminated soil), no need for chemical pesticides. This means that the local aquaponics tomato uses less resources, making it more environmentally friendly”*

*“Now, lets talk about the quality of the tomato”*

Set both tomatoes next to each other. The traditional farming tomato is likely to be more bruised, as it has passed through many hands (and maybe even dropped on the floor)

*“Which tomato would you rather eat? Why?”*

Discuss how the traditional farmed tomato was touched by many people, and how long it took to get to the consumer.

## Optional

- What other types of farming use less resources and are more environmentally friendly? (e.g. organic) Why?
- Is aquaponics always the best choice? When would traditional organic farming be a better choice? (e.g. large crops that need the space to grow outside)

**Table 1: Ontario Curriculum Links**

Grade	Subject Area	Ontario Curriculum Links
3	Science and Technology	<p><b>Growth and Changes in Plants</b></p> <p>Specific Expectation:</p> <p>1.1 assess ways in which plants are important to humans and other living things, taking different points of view into consideration and suggest ways in which humans can protect plants</p> <p>1.2 assess the impact of different human activities on plants, and list personal actions they can engage in to minimize harmful effects and enhance good effects</p> <p>3.7 describe the different ways in which plants are grown for food (e.g., on farms, in orchards, greenhouses, home gardens), and explain the advantages and disadvantages of locally grown and organically produced food, including environmental benefits</p>
3	Social Studies	<p><b>Living and Working in Ontario</b></p> <p>Specific Expectation:</p> <p>B1.1 describe some major connections between features of the natural environment of a region and the type of land use and/or the type of community that is established in that region (e.g., ports on lakes or major rivers; farming on flat land with fertile soil; resource towns in areas with ore, trees, or other natural resources)</p>
4	Science and Technology	<p><b>Habitats and Communities</b></p> <p>Specific Expectation:</p> <p>1.1 analyse the positive and negative impacts of human interactions with natural habitats and communities (e.g., human dependence on natural materials), taking different perspectives into account (e.g., the perspectives of a housing developer, a family in need of housing, an ecologist), and evaluate ways of minimizing the negative impacts</p> <p>3.9 demonstrate an understanding of why all habitats have limits to the number of plants and animals they can support</p>
4	Social Studies	<p><b>Political and Physical Regions of Canada</b></p> <p>Specific Expectation:</p> <p>B1.3 describe some key actions taken by both industries and citizens to address the need for more sustainable use of land and resources</p> <p>B2.5 evaluate evidence and draw conclusions about issues and challenges associated with balancing human needs/wants and activities with environmental stewardship in Canada</p>

5	Social Studies	<p><b>The Role of Government and Responsible Citizenship</b></p> <p>Specific Expectation:</p> <p>B1.3 create a plan of action to address an environmental issue of local, provincial/ territorial, and/or national significance</p> <p>B2.1 formulate questions to guide investigations into social and/or environmental issues in Canada from various perspectives, including the perspective of the level (or levels) of government responsible for addressing the issues</p> <p>B2.5 evaluate evidence and draw conclusions about social and/or environmental issues, outlining the strengths and weaknesses of different positions on the issues, including the position of the level (or levels) of government responsible for addressing the issues</p> <p>B3.6 explain why different groups may have different perspectives on specific social and environmental issues</p>
6	Social Studies	<p><b>Canada's Interactions with The Global Community</b></p> <p>Specific Expectation:</p> <p>B1.3 explain why some environmental issues are of international importance and require the participation of other regions of the world, along with that of Canada, if they are to be effectively addressed</p> <p>B2.1 formulate questions to guide investigations into global issues of political, social, economic, and/or environmental importance</p> <p>B2.3 analyse and construct different types of maps, both print and digital, as part of their investigations into global issues, their impact, and responses to them</p> <p>B2.4 interpret and analyse information and data relevant to their investigations, using a variety of tools</p> <p>B3.7 identify countries/regions with which Canada has a significant economic relationship and some of the reasons why close relationships developed with these countries/regions and not others</p>

**Table 2: Character Card Reference Sheet**

<b>Traditional Farming Character Cards</b>		
<p><b>#1 Farm Worker</b></p> <p>“I’ve been growing these tomatoes outside, using lots of water and pesticides to help them grow. They aren’t ripe yet, but I need to pick them today so that they can get shipped out tomorrow. It sure is hard on the land only growing tomatoes all the time! I better make sure to add lots more fertilizer!”</p>	<p><b>#2 Farm Boss</b></p> <p>“Thanks for the tomatoes. I wonder if people in Canada even know we send them unripe tomatoes? Keep up the good work, we’ll need to send another batch soon. And don’t forget the pesticide! People only buy tomatoes that look perfect.”</p>	<p><b>#3 Truck Driver</b></p> <p>“Thanks for the tomatoes. I know I should be gentle, but sometimes I drive over bumps! It’s a long drive to Canada. These tomatoes are going to travel thousands of kilometers!”</p>
<p><b>#4 Warehouse Operator</b></p> <p>“Finally, the tomatoes arrived. Still green. Some of them are too bruised to sell, so I must throw them out. Before I send the good ones to the grocery store, I need to gas them with ethylene for 24 hours, to help them ripen.”</p>	<p><b>#5 Grocery Store Owner</b></p> <p>“Look at the label on these tomato boxes; they have done more travelling than me! Some of them are too bruised to sell and some have gone bad, so I must throw them out. It seems strange to buy tomatoes from so far away; don’t farmers in Ontario grow tomatoes?”</p>	<p><b>#6 Consumer</b></p> <p>“Okay, I need some tomatoes for homemade pasta sauce. Here they are...they feel pretty hard, but they look okay. Wow, they came from Mexico? Well, it’s the only type of tomato here. I guess I’ll buy it.”</p>
<b>Aquaponics Character Cards</b>		
<p><b>#1 Local Aquaponics Farmer</b></p> <p>“I grew these tomatoes at my aquaponics farm, in an old warehouse downtown. Amazing to think I can grow food in the middle of the city, inside a building! Growing inside means I don’t use pesticide, and all that fish poop in the water is better than any chemical fertilizer! These tomatoes look 100% ripe and delicious, so I will pick them today, and take them to the farmers market to sell tomorrow.”</p>	<p><b>#2 Customer</b></p> <p>“I love coming to the farmers market every Saturday. I walk over and always find lots of delicious looking food, and the farmers are super friendly. Your tomatoes look really good. I’ll buy a basket to make pasta sauce for supper.”</p>	