



# Where Does Our Food Come From?

*A lesson to help grade 3-8 students appreciate the impact our food system has on climate change*

By **Susan Rauchwerk**

**C**LIMATE CHANGE IS AN ISSUE that can easily overwhelm young learners. The following lesson uses the lens of food to help learners consider the multifaceted nature of the problem and its solutions. Few students understand the complex system of global food production, or that agriculture contributes one third of current CO2 emissions. This lesson sparks investigations into the social, economic, and scientific factors that influence how food is grown and produced, and invites learners to consider how their food choices can impact global climate change.

Life in North America does a good job of distancing us from the reality of food systems. By investigating the source of their food, students begin an individualized journey into global health and personal wellness. It is an area where they can become empowered to effect change, given that they exert quite a bit of control over what they eat.

Inspired by the Aquatic Project WILD lesson called *Water We Eating?*,<sup>1</sup> the following activity is a cross-disciplinary STEAM (science, technology, engineering, arts and math) lesson that can address standards within multiple subject areas. It is designed to help learners recognize how the food decisions each of us makes ultimately impacts global

climate change. In this lesson, learners are introduced to large- and small-scale food production, the politics around “truth” in advertising and food labelling, the political forces driving food production, and the sometimes contradictory information about how organic or local food and GMOs (i.e., genetically-modified organisms) impact personal and environmental health. Through investigation and collaboration, students learn to identify sources and to use science to verify claims.

In the process of uncovering the facts about how and where food is grown, students may learn things they do not really want to know, such as how livestock factory farms function, or that their favorite snack contains numerous dyes and chemicals. It is important to be sensitive to their responses, but don’t shy away from investigation because you are worried about how someone will feel. Invite exploration of the facts without judgment. Discuss the moral and ethical issues that surface. Be aware that family members may work for an agribusiness or large food company. Any lesson about climate change may debunk myths and beliefs, which can spark an emotional response. Be prepared for surprise, defensiveness, resistance, and dismissal.

The pedagogical foundation for this activity is critical exploration,<sup>2</sup> an approach that invites learners to generate and follow their own ideas. In this approach, the teacher is

a support and guide, keeping learners engaged by providing interesting materials and prompts that embody the content to be explored. Students follow any number of productive pathways as they engage with the authentic materials, peers, and experts. Learners experience a range of responses, from wonderment to frustration, as they uncover information that challenges existing schema. The challenge for the teacher is to trust that learners will build upon their existing understandings through the materials.

## Time

The following lesson can take anywhere from three to eight hours depending upon how deeply you want to explore the topic. It can be taught in concentrated periods of time, but works equally well spread out in shorter time blocks across it an entire semester. The lesson is divided into three parts. If time is limited, part one can stand alone as an introductory activity.

## Goals and objectives

Students will research, document and share information about a food item through a multi-media product. They will use technology-based tools and resources to investigate the multiple factors and perspectives influencing where and how food is grown, harvested and distributed. They will communicate with food producers via email or phone to resolve questions and request more information, then document the environmental impacts of their product and how it may contribute to global climate change.



## Background

The US and Canada are among the top ten emitters of carbon, and rank first and second in per capita emissions. On average, individual Americans and Canadians contribute more than double the emissions per person than those living in other top ten emitting countries. Worldwide agricultural practices contribute about one third of the CO<sub>2</sub> currently emitted into our atmosphere, and almost fifty percent of agricultural emissions are being generated in North America. Even though modern agricultural practices are said to maximize efficiency, their dependence upon fossil fuels contributes to the negative impacts that climate change is already having on food production. As Canada and the United States combined are the third largest producer and distributor of food in the world, what food we grow, and how it is grown, processed, and distributed, can have a significant impact on global CO<sub>2</sub> emissions.<sup>3</sup>

The Climate Change and Food Symbaloo<sup>4</sup> contains links to search engines, websites, videos, and articles that provide background information about climate change and food production. It is by no means an exhaustive list, but provides good launching points for you, your students, and their families to learn about the basics of climate change, how food is connected to climate change, and where you can find good resources on the topic. Since you and your students will likely find more sites and resources, you may want to build your own class list.

## Materials

Obtain at least three food package labels per child in your class. You can either ask students to bring in labels from their favorite snacks or search the recycling bins in your school to collect them from student snacks. (Be sure the labels are clean, so as to not attract ants and mold.) It may take several weeks to amass a robust collection. In the end, you need enough labels so that students will appreciate the diverse range of information that they include such as ingredients, websites, phone numbers, addresses, and whether ingredients are non-GMO, organic, naturally produced or hormone free, etc.

Whenever possible, select labels that include websites and phone numbers, as these will be valuable for students' investigations. Within any of the categories listed, you are looking for packaging that offers students terms and resources worth investigating. Egg cartons provide a terrific example of a wide range of agricultural terms that can be found on packaging, such as organic, free range, cage-free, non-GMO, antibiotic-free, natural, heirloom, protein-rich and gluten free. Some even include stories about the owner! The combined collection of labels should have a diversity of ingredients and supplemental product and marketing information. The list below outlines the types and numbers of labels you will want for a class of 25. **Warning:** be sure to check if any participants have allergies and whether handling food packaging is problematic.

- 10 produce bags or meat labels with just one or two ingredients (some may have a preservative added).
- 10 package labels from common junk food. These labels should have a long list of ingredients with many unfamiliar words.



- 20 package labels from popular products that are made from three or fewer ingredients, such as dried fruit, nuts, canned or frozen fruits and vegetables, potato chips, juice, or tomato sauce.
- 10 package labels that imply or are marketed as being healthy. Ideally, these will have a varied number of ingredients and labels such as organic, natural, recommended by doctors to reduce..., etc.
- 10 labels from a wide variety of international foods – some with only a few ingredients and some with many.
- 10 labels from commodity crops such as corn, wheat, rice, potatoes or soybeans. It is helpful to have labels with ingredients that are derived from corn, most of which will be sweeteners or thickeners.
- A map of the world and a globe. If you have small pushpins and yarn, students can identify the source of their food and where it is distributed. This helps to identify the carbon footprint of the product they choose to study.
- A technology-rich space with a strong internet connection and several computers, tablets and/or smart phones.
- A multi-media reporting format such as Book Creator, PowerPoint, Prezi or Google Slides.

You may also want to have natural food samples, markers, drawing paper, scissors, glue, craft materials, dress-up clothing in case students want to “conduct interviews,” magazines they can cut up, and clay for making objects. If available, it could be helpful to have a camera, tripod, stop-motion software and a green-screen<sup>5</sup> to support video production.

## I: Exploring food labels and climate change resources

Explain to the group that they are starting an investigation into where food comes from, and how food is connected to climate change. Invite a conversation by asking a general question to assess their current understanding of climate change, such as “*Please tell us about any ideas or experiences you have had with climate change.*” There is no need to correct what they say or give them a short talk on climate change. This is just an opening question to get them to share their thoughts. Encourage all learners to share their ideas, regardless of their prior knowledge and experience. They may tell you about a book they have, a program they saw, something they heard, a place they have been, or they may say they know nothing about climate change. If they have questions, invite a conversation among the class. This allows others to share and provides you with a better understanding of their knowledge base. Resist the urge to correct them or elaborate unless you feel it will invite more student discussion or reflection. Jot down their ideas on the board or chart paper so you can remind them of these ideas in a later clarification session.

After this brief introductory assessment, split the class into four to five groups. Give each group a mixed set of food labels and ask the following essential question: *What can you find out from these labels about where your food comes from?* Invite them to explore the packaging to find out whatever they can. Write the essential question and the following additional questions on the board or chart paper.

- *What are the ingredients?*
- *What is the main ingredient and how do you know?*
- *Where is the product made and/or distributed?*
- *What can you find out about the product from the label?*
- *Is there anything that surprises you?*

Circulate between the groups, modeling how to look at the packaging. Encourage everyone to share. As you listen, keep your comments enthusiastic, general and non-linear. Let their comments and observations guide what you choose to do next. Encouraging words are usually enough to keep them engaged. Questions like the following can keep them looking and wondering: *How does that relate to your products? Does that surprise you? What else do you see? Is that similar to another product? Does that make you wonder about anything?* Some students enjoy sounding out some of the more obscure ingredients, and get excited about ingredients or products they recognize.

Students will ask questions such as: *What is sea salt? Where is Malaysia? or What does organic mean?* If you feel the questions are off-topic, pick up a package and model the asking of exploratory questions. Your job is to keep them engaged, thinking, and exploring the information on the package that helps them find out about where and how the product is produced and distributed. When a comment or question is productive, encourage them to pursue it further. If it is not practical to investigate their question with the materials you have on hand, write it down for another time.

Bring the class back together to share some of what they have found out and document interesting ideas and questions on the board or chart to refer to later on.





Have students split into teams of two to three students. Establish label sets that provide a good cross-section of products across the class. Above all, you want the class to explore how key crops like the following are grown, harvested and distributed: wheat, corn, potatoes, rice, soy, beef, salmon, fruits, vegetables, nuts, chocolate, sugar, etc.

Set up each group with a key food that is different from other groups so that collectively the class covers a broad range of foods. After five minutes of exploration, ask each group to select one package label that has fewer than four ingredients that they want to find out more about. Have students spend the next 30 to 40 minutes finding out everything they can about where and how the main ingredient is grown, processed, and distributed. They will need electronic devices and an open internet connection. Providing them with the Food and Climate Change Symbaloo is a good place to start. Exploring company websites or calling the phone numbers on the packages can be both exciting and frustrating. It is often unclear what is marketing and what is fact. Pay attention to these moments of discord, as they can spark rich discussion and deep investigations. If you have non-readers, support them in using screen readers and finding video resources. You can also partner readers and non-readers, but be certain that both have the opportunity to contribute and investigate. Have groups keep track of what they find by providing them with a record-keeping template that contains the questions found in part two of this lesson. They can be loaded directly into a BookCreator or PowerPoint template, or you can allow students to develop their own graphic organizer. It is best if it is an electronic template so it is easy for them to store images, websites and videos.

After 30 minutes or so, bring the class together and have each group highlight something that they found. Have

groups discuss what they found out about main ingredients, and encourage discussions that reveal key processes such as organic versus conventional farming, local versus global distribution, and vague or missing information about the source of the product. Use information they find as launching points for presenting and exploring facts related to climate change. This is a good time to watch a movie or video, explore data tables and websites as a class, read a book and invite a climate change scientist to visit your classroom to discuss topics such as the carbon cycle and greenhouse gasses. Following these investigations, bring out a map of the world and a globe to help visualize the scope of how and where food is grown, transported and distributed. This exploration can last several different class sessions. During these presentations, be sure to have groups refer back to their report notes to provide examples from their own research that illustrate key points highlighted. Wrap up this part by asking if they have any particular ideas that stand out for them. Encourage students to follow ideas further by having materials available during free time. Encourage learners to discuss what they found out with their friends or families, and ask if there are any actions they may want to take.

## II: Building a multi-media story

Have students construct a story about their product. Encourage them to use audio, video, drawings, construction, magazine clips, links, etc. to make a multi-media presentation. Ask the students to use the contact information on labels to email or phone the company that produced the product. Use the questions below to help guide their investigation. Students will likely come up with questions of their own in the process. The order and structure will vary by group.

- *What are the key ingredients in your product?*
- *What other ingredients stand out for you and why?*
- *How and where are the key ingredients grown?*
- *Where is the company that produced this product, and where do they get their ingredients?*
- *Do you know how this product is produced and/or distributed?*
- *How far did this product travel to get to you?*
- *Does the production or distribution of this product impact the environment in any way?*
- *In what ways might your product contribute to global climate issues?*
- *What challenges did you face when researching this topic/product?*
- *How do our food choices impact the environment?*
- *How does this product relate to global climate change?*
- *Can we solve climate change by changing the food we eat?*
- *What message would you like to send to others about this product?*

After about one hour, when their documentation is complete, have groups pull this information together in a short story about their product that highlights key aspects of their



food product, how it relates to climate change, and a recommendation for the viewer about decisions they can make about the food they eat. Have them use a storyboard<sup>6</sup> template to construct a video, stop-motion animation, cartoon, or storybook. These should be about two minutes in length, and should highlight one or two key elements they discussed in more depth in their report. If you do not have access to video technology they can make a poster, collage, diorama, short skit, comic strip or mural.

Have students spend the next 45 minutes to an hour storyboarding. The storyboard should be a “service announcement” informing the “reader” about the relationship between the products and climate change. Have each group share and critique their storyboard with other groups to help clarify their message. This is generally a very lively process, with a great deal of laughter and inter-group discussions.

### III: Climate change café

Groups need an hour or so to make the video or poster based on their storyboard design using whatever formats you have offered them. It is helpful to recruit high school media students and the school media center to support this process. Their product should answer some or all of the questions provided earlier, but should also have a tone and clear message that expresses each group’s assessment of the product, and how it relates to climate change.

The last hour of this lesson is devoted to a climate change café where students share their reports and PSAs in a casual showcase. You can make it as small an event as you wish, or a larger one by inviting other classrooms or families. Consider having snacks that include local sustainably grown food. (Farms and local groceries are often more than willing to donate carrots or other local foods for such an event.) Depending upon the number of presentations you have, you can spread it out over several days, or divide the class and visitors into smaller groups so that each group is only viewing three to four reports and videos. If possible, invite a local climate change expert from a nearby university, nonprofit or nature center to help answer some of the questions that may surface.

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#### Notes

1. Council, W. (1987). *Aquatic Project Wild*. Project Wild, Salina Star Route, Boulder, CO.
2. Duckworth, E. (2009). Helping students get to where ideas can find them. *The New Educator*, 5(3), 185-188.
3. Global Climate Change. (2014). National climate assessment. Retrieved from <http://nca2014.globalchange.gov/>, (<https://www.treehugger.com/green-food/6-ways-agriculture-impacts-global-warming.html>)
4. Curated links to food production and distribution resources; <https://edu.symbaloo.com/mix/foodandclimatechange>
5. <https://www.livescience.com/55814-how-do-green-screens-work.html>
6. Stop-motion animation storyboard template <http://www.bbc.co.uk/north-ernireland/myplacemyspace/downloads/promote-your-day-out/storyboard-template.pdf>



## Teaching Resources

### Sample videos and books made by my students

- Dried Mango <https://www.teachertube.com/video/where-does-your-food-come-from-mango-psa-video-454999>
- Veggie Chips <https://www.teachertube.com/document/33758>
- Dried Pineapple <https://www.teachertube.com/document/33759>

### Accurate, science-oriented lessons on food and climate change:

- NOAA: <http://www.noaa.gov/resource-collections/climate-education-resources>
- NASA: <https://climate.nasa.gov/resources/education/>
- EPA: <https://www.epa.gov/students/lesson-plans-teacher-guides-and-online-resources-educators>
- Kid World Citizen: <http://kidworldcitizen.org/2012/08/24/where-in-the-world-is-your-food-from/>
- Clean Net: [http://cleanet.org/clean/educational\\_resources/index.html](http://cleanet.org/clean/educational_resources/index.html)
- Australian Eco-Friendly Food: <http://www.ecofriendlyfood.org.au/media/pdf/Years%202-3%20lesson%20plan%20A.pdf>

### Lesson ideas from agribusiness

- <http://www.myamericanfarm.org/>