**NGSS Lesson Planning Template**

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| **Grade:** 5 | **Topic:** Earth and Human Activity | **Lesson (number/title): 45 minutes plus closing activity** |
| **Brief Lesson Description: *Introduction/Foundational Lesson*****Students will learn about the concepts of ‘food miles’ -the distance a food travels from from where it is produced to where it reaches the consumer. Food that travels a long distance and have many ‘food miles’ consume a much larger amount of fuel, and thus release more carbon dioxide and greenhouse gases into the atmosphere. These foods are also not as fresh as those produced locally.**  |
|  **Performance Expectation(s):** **5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect Earth’s resources and environment** |
|  **Specific Learning Outcomes:*** I can learn about the impact on the environment of producing and shipping food.
* I can determine ways to reduce my impact on the environment by choosing foods that are grown locally.
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| **Narrative / Background Information** |
| **Prior Student Knowledge: K-2 Things people do can affect the environment but they can make choices to reduce their impacts.**  |
| **Science & Engineering Practices:**[Obtaining, Evaluating, and Communicating Information](http://www.nap.edu/openbook.php?record_id=13165&page=74)[Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.](http://www.nap.edu/openbook.php?record_id=13165&page=74)[Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.](http://www.nap.edu/openbook.php?record_id=13165&page=74) | **Disciplinary Core Ideas:**[ESS3.C: Human Impacts on Earth Systems](http://www.nap.edu/openbook.php?record_id=13165&page=194)[Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments.](http://www.nap.edu/openbook.php?record_id=13165&page=194) | **Crosscutting Concepts:**[Systems and System Models](http://www.nap.edu/openbook.php?record_id=13165&page=91)[A system can be described in terms of its components and their interactions.](http://www.nap.edu/openbook.php?record_id=13165&page=87) |
| **Possible Preconceptions/Misconceptions** |
| **LESSON PLAN – 5-E Model** |
| **ENGAGE: Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions*** Ask the following questions to the class. Record some general answers on the board.
	+ Where does our food come from?
	+ If you bought it from a store, where did it originally come from?
	+ How far do you think your food travels from where it was grown to where it produced?
	+ When you buy food what things do you consider?
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| **EXPLORE: Lesson Description – Materials Needed / Probing or Clarifying Questions*** Introduce the term “food miles” (see brief lesson description above)
* Discuss how food choices impact the environment (food shipped from a long distance requires more fuel, packaging, etc) (food produced locally requires less of these things and keeps money in the local economy)
* Ask the class how they can reduce their impact on the environment by making different choices (buy local and in season when possible).
* Talk about how foods from the grocery store have origin labels to tell consumers where they were produced.
* Have students brainstorm a list of 5-10 of their favorite fruits and vegetables.
* Using the link below, have students search for the Top 5 producers/exporters of the fruits and vegetables on their list. Ask students to record the top producer/exporter of each fruit and vegetable in their science notebooks. <https://top5ofanything.com/index.php> (The search bar is located in the top right corner above the “Browse a Category” drop down menu.)
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| **EXPLAIN: Concepts Explained and Vocabulary Defined*** Make a list of the top few countries of origin that the kids found during their exploration.
* Type these into <http://www.foodmiles.com> to demonstrate how far these foods travel from production to consumption.
* Compare this with the distance to the local farmer’s market, school garden, or pick-your-own farm, discussing environmental impacts again.
* Discuss the West Middle School Garden and how it has been set up as a business and production garden. (West gardeners provide all of the tomatoes and cucumbers for the cafeteria, it also sells many herbs to the Merc deli, the student gardeners get paid for their work in the garden and when selling at local farmer’s markets)
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| **ELABORATE: Applications and Extensions*** Use the classroom world map to plot the most common food producing countries to show the students where these foods are produced.
* Then, take students to the school garden. Work together to measure the distance from the school garden to the cafeteria. (This could be done many ways - counting floor tiles, stretch out yarn from one point to another and then measuring the yarn, using a tape measure/yard sticks, estimation, etc.) Ask students: What are the positive impacts of a school garden? (including those not related to food miles -i.e. physical activity)

**Closing:*** Have the students create persuasive posters encouraging their peers to buy and eat local foods.
* Share these as a class discussing the lessons learned today. Hang these posters throughout the school.
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| **EVALUATE:** **Formative Monitoring (Questioning / Discussion):*** Assess through classroom discussions and exploration observations.

**Summative Assessment (Quiz / Project / Report):*** **N/A**
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| **Elaborate Further / Reflect:** * Students can write letters to local produce managers to ask where the majority of certain types of produce originate.
* Students can write letters to businesses encouraging them to support local farms.
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**Materials Required for This Lesson/Activity**

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| **Quantity** | **Description** | **Potential Supplier (item #)** | **Estimated Price** |
|  | **Science Notebooks** |  |  |
|  | **Computers/iPads** |  |  |
|  | **Measuring Device** |  |  |
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