Sweet Potatoes

*Lesson Plan for Grade 6 , Science*

*Prepared by NAITC*

*Modified by Mississippi State University, School of Human Sciences*

*for Mississippi Farm Bureau Federation - AITC*

# OVERVIEW & PURPOSE

In this lesson students will identify common Thanksgiving foods and their farm source, determine if those foods can be produced locally, and locate the common origins of their Thanksgiving day dinner.

# EDUCATION STANDARDS

**Mississippi College-and-Career Readiness Standards:**

L.6.3 Students will demonstrate an understanding of the relationships among survival, environmental changes, and diversity as they relate to the interactions of organisms, populations, and the environment.

**NALOs**

T1.6-8.g Recognize how climate and natural resources determine the types of crops and livestock that can be grown and raised for consumption

T2.6-8. f Identify where labeling indicates the origin of food and fiber

T3.6-8. i Identify sources of agricultural products that provide food, fuel, clothing, shelter, medical, and other non-food products for their community, state, and/or nation

T5.6-8.g Identify agricultural products that are exported and imported

OBJECTIVES

* Students will be able to identify common Thanksgiving foods and their farm source.
* Students will be able to list foods that can be produced locally.
* Students will be able to locate the common origins of their Thanksgiving day dinner.

# MATERIALS NEEDED

* Computer with internet access, projector, and screen
* [Geography of Thanksgiving Dinner](https://cdn.agclassroom.org/media/uploads/2016/11/18/The_Geography_of_Thanksgiving_Food_Cards.pdf)food cards, 1 copy per class
* [Thanksgiving Dinner Map](https://cdn.agclassroom.org/media/uploads/2015/10/22/Thanksgiving_Dinner_Map.pdf)to project on screen

Essential Files:

* [Thanksgiving Dinner Map handout](https://cdn.agclassroom.org/media/uploads/2015/10/22/Thanksgiving_Dinner_Map.pdf)
* [The Geography of Thanksgiving food cards](https://cdn.agclassroom.org/media/uploads/2016/11/18/The_Geography_of_Thanksgiving_Food_Cards.pdf)

# Lesson Set Up:

Activity 1-

* Be sure to use your own background knowledge and/or research products that are not typically produced within a 100 mile radius of your school.

Activity 2-

* Display the following maps:
  + [Citrus Map](http://www.nefbmap.org/map.php?P=22&PV=0)
  + [Hog and Corn Production Maps](http://nefbmap.org/map.php?M=7&MV=0&P=39&PV=0)
  + [Farmer-operator and Geographic Area Maps](http://nefbmap.org/map.php?M=0&MV=0&P=44&PV=0)
  + [Beef Cow and Geographic Area Maps](http://www.nefbmap.org/map.php?M=0&MV=0&P=35&PV=0)
  + [Beef Cow and Acres of Pastureland Maps](http://nefbmap.org/map.php?M=43&MV=0&P=35&PV=0)
  + [Rainfall and Beef Cow Maps](http://nefbmap.org/map.php?M=35&MV=0&P=50&PV=0)
* Print the [attached document](https://cdn.agclassroom.org/media/uploads/2016/11/18/The_Geography_of_Thanksgiving_Food_Cards.pdf) front to back. This will make 12 sheets of paper.
* Project the attached [Thanksgiving Dinner Map](https://cdn.agclassroom.org/media/uploads/2015/10/22/Thanksgiving_Dinner_Map.pdf) on the board.

# Vocabulary

**commodity:** a primary agricultural product that can be bought and sold

**crop:** a cultivated plant that is grown as food, especially a grain, fruit, or vegetable

**livestock:** farm animals (such as cows, horses, and pigs) that are kept, raised, and used by people

# Ag Facts:

* Thanksgiving didn't become an annual tradition until 200 years after the pilgrims celebrated the first Thanksgiving.
* Venison was the meat of the first Thanksgiving feast, not turkey.
* Pumpkin pie and potatoes were not a part of the first Thanksgiving feast.
* Mississippi ranks #3 in the U.S. in sweet potato production, producing 5.34 million hundredweight annually.
* In 2021, Mississippi harvested 29,500 acres of sweet potatoes on 172 farms.
* It takes approximately 90 to 120 days to grow a sweet potato.
* Planting takes place in late May and June. Harvesting runs from  
  late August through November.
* Mississippi hosts the National Sweet Potato Festival each November in Vardaman, which is the sweet potato capital of the world.
* Sweet potatoes are an excellent source of vitamin A, vitamin C and vitamin B6. They are also low in sodium.

# Background Information for Teacher:

Thanksgiving is a traditional American holiday celebrated in November. The holiday has historical roots to the early pilgrims who settled America. It's purpose is to celebrate the year's harvest and give thanks. This lesson provides an opportunity for students to recognize the foods they will likely consume in a traditional Thanksgiving dinner and learn how and where they are likely produced.

As agricultural technology has improved and populations have increased, the agricultural production of our food and fiber has changed to meet the growing and changing demands in our society. Many years ago the majority of the food in our diet was provided by our own gardens and farms or from local farmers. Most consumers played some part in the production of their food. In contrast today, only a very small portion of our population produces the food for our society as a whole. Fewer Americans have first hand experience with and knowledge of farms and the production of their food.

For some Americans, it is becoming increasingly more important to them to know more about how and where their food was produced. Recent growing demand for locally and regionally produced food has opened up new market opportunities. Many efforts and initiatives have been established to increase this awareness and improve a local farmer's ability to market their products locally. *Locavore* is a term used to describe someone who chooses to only consume food that is produced within a certain distance of their home, usually 100 miles. As a whole, consuming locally grown foods is good for local economies. Purchasing local foods can also increase agricultural literacy for consumers and help build a greater awareness for where their food comes from.

While there are benefits to purchasing local foods, educated consumers should also be aware of the limitations. In general, choosing to eat only locally grown foods will limit the variety of foods and nutrients you will have access to. The climate of a particular region plays a huge role in determining what kind of foods can be grown there. Length of the growing season, soil fertility, access to resources and markets, water, and available open space are also key factors to be taken into consideration. Technology does increase a farmer's ability to grow **crops** in less suitable conditions. For example, a greenhouse can be used to extend the growing season to successfully grow produce in a colder climate. However, growing crops in a greenhouse significantly increases the cost of production, which would then be passed on to the consumer. For this and other reasons, farms are typically located in geographic locations that have the proper climate and resources to produce a **commodity** at the lowest cost. After the commodity is harvested it can be packaged and shipped by truck, plane, or train to locations near and far.

Here are some geographical facts about the production of common Thanksgiving dinner foods and their ingredients:

* **Pumpkin:** Illinois is the top pumpkin producing state.Pumpkins are rich in beta-carotene. Pumpkins are grown throughout the country for their ornamental value at halloween. However, commercial pumpkin growers process and can pumpkin for use in pumpkin pie, cookies, and other foods. 95% of the pumpkins processed in the United States are grown in Illinois![Watch Libby's 100% Pure Pumpkin from Farm to Can](https://www.youtube.com/watch?v=Hft-zbqxeLM) to learn how pumpkin is processed.
* **Turkey:** Minnesota is the top turkey producing state. Other state statistics can be found on the interactive [map](http://nefbmap.org/map.php?P=32&PV=0). For more information about raising turkeys, watch the video clip, [*Visit the Halvorson Turkey Farm*](https://youtu.be/2DQtHVhI1S0) produced by the Minnesota Turkey Grower's Association.
* **Cranberries:** Wisconsin is the leading producer of cranberries, followed by Massachusetts.Cranberries grow on a woody evergreen vine and prefer acidic soil with a pH between 4 and 5.5. Watch [*The Life Cycle of a Cranberry Harvest*](https://www.youtube.com/watch?v=F1m7tCAA8Zk) to learn how cranberries are harvested and grown. Cranberries can be eaten year round when they are dried. These are known as craisins. The peak season for the consumption of cranberries is during the Thanksgiving and Christmas holiday season. Cranberries are used in jams, jellies, and other toppings for traditional meals.
* **Wheat:** Kansas is the leading producer of wheat in the United States. Other state statistics can be found on the interactive [map](http://nefbmap.org/map.php?P=9&PV=0). Flour is used in many types of baking including breads, pies, and pastries. Flour is a processed form of wheat. Watch the Science Channel's [*How It's Made-Flour*](https://www.youtube.com/watch?v=u6k9zyi3OKo&t=15s)episode for more information about processing wheat into flour.
* **Eggs:** Iowa leads the nation in the production of eggs. Other state statistics can be found on the interactive [map](http://nefbmap.org/map.php?P=30&PV=0). Although all species of poultry produce eggs, chicken eggs are the primary source of our food because chickens are most efficient at producing eggs. On average a laying hen produces 6-7 eggs per week. Eggs are used in many recipes. They help bind ingredients together and act as a leavening agent.
* **Milk:** California is the leading producer of milk followed by Wisconsin and Idaho. Other state statistics can be found on the interactive [map](http://nefbmap.org/map.php?P=28&PV=0). Milk is used in many ways. It can be used for fluid milk consumption, but it is also used to make ice cream, yogurt, sour cream, cheese, and many other dairy products.
* **Sugar:** Sugar can come in many forms including brown sugar, table sugar or powdered sugar. It is used in many foods as a sweetener. The two primary sources of sugar in the United States are sugarcane and sugarbeets. Sugarcane is a tall perennial grass grown in tropical and subtropical climates. Florida is the largest sugarcane producing state. The only other states that produce sugar cane are Louisiana, Hawaii, and Texas. Minnesota is the leading state to produce sugarbeets. Other state statistics can be found on the interactive [map](http://nefbmap.org/map.php?P=14&PV=0). Watch the PBS America's Heartland episode, [Sugar Beet Harvest](https://www.youtube.com/watch?v=ksN7h-ZpFWc) to learn how sugar beets grow and are harvested. The video [*What is Sugar?*](https://youtu.be/5uAcBsLHTeo) will help students recognize how plants make sugar (sucrose) through photosynthesis.
* **Sweet Potatoes:** North Carolina leads as the top producer of sweet potatoes. Their climate and soil conditions are ideal for sweet potato production. Sweet potatoes are grown across the country, but they are best suited for cultivation in Southern States which have warmer climates and longer frost-free growing seasons relative to other regions of the United States. Watch the America's Heartland video clip, [What's the Difference Between a Sweet Potato and Yam?](https://www.youtube.com/watch?v=bwgOGmAHHng)
* **Green Beans:** Wisconsin is the leading producer of green beans.Green Beans can be purchased fresh, frozen or canned and used as a side dish or baked with other foods.
* **Corn:** Iowa is the leading state in the production of corn, followed by Illinois. See the interactive [map](http://www.nefbmap.org/map.php?P=7&PV=0) for more state statistics. Many varieties of corn are grown for various purposes. Varieties of field corn are grown for **livestock** feed and the production of ethanol. The corn we eat is known as sweet corn. The midwestern region of the United States is known as the "Corn Belt." These states include Iowa, Missouri, Nebraska, Kansas, Indiana, and Illinois. This area is ideal for the growth of corn due to the fertile soil, relatively level land, warm nights, hot days, and well-distributed rainfall.
* **Potatoes:** Idaho leads the nation in the production of potatoes. Other state statistics can be found on the interactive [map](http://nefbmap.org/map.php?P=34&PV=0). Potatoes originate from the Andes mountains. They thrive in high altitude regions with warm days and cold nights.
* **Carrots:** California is the top carrot producing state. See the interactive [map](http://www.nefbmap.org/map.php?P=19&PV=0) for other state statistics.

# LEARNING PROCEDURES

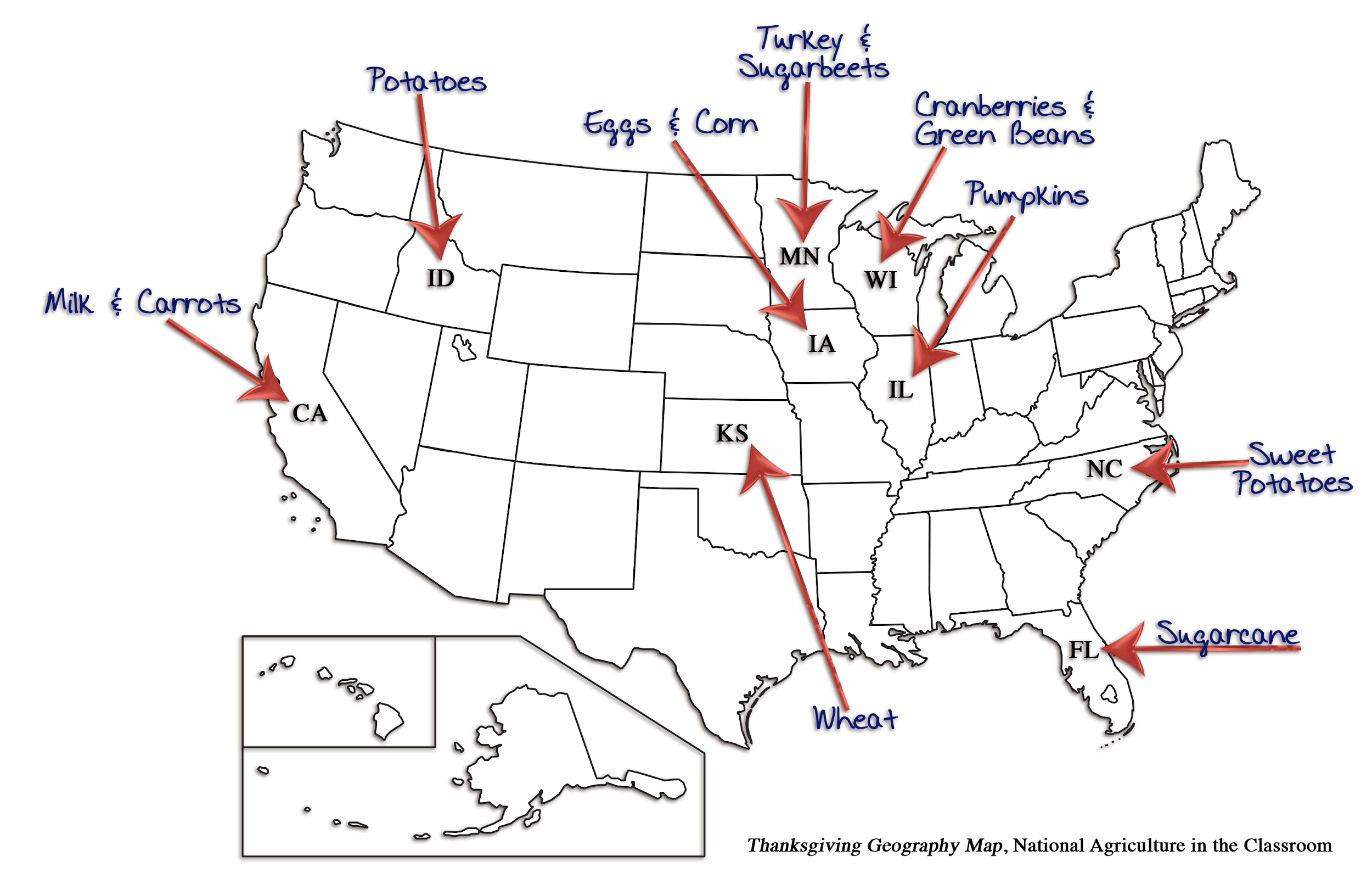
Interest Approach:

1. Inform your students that they are in charge of making the shopping list for Thanksgiving dinner.
2. As a class, make a list on the board of the foods you will need to prepare your meal. Foods will vary from family to family. Focus mainly on traditional Thanksgiving foods, but include others to fit the needs of your class. Students should also include the ingredients to make each dish. For example, to make pumpkin pie you will need pumpkin, sugar, milk, spices, flour, and butter.
3. Once the shopping list is complete, inform your students that they will be learning about the geographic origins of their Thanksgiving dinner.

Activity 1:

1. After completing the Interest Approach or Motivator, students should have a general idea of the foods and cooking ingredients typically used at a traditional Thanksgiving meal. Leave the list on the board for the students to see.
2. Instruct your students to watch carefully. In silence, cross out all foods on the shopping list that are not typically produced within a 100 mile radius of your school. Use your own background knowledge and prior research if necessary to accomplish this task.
3. Encourage students to think critically by asking them, "What kind of foods did I just cross off?" Allow students time to think and process your question and then offer their ideas. Your goal is for students to recognize that you crossed off foods that are not produced locally. In your class discussion, build upon their comments and provide students with guiding questions such as:
   1. *Where are all of these foods produced? (farm)*
   2. *Do any of these foods require special growing conditions? (Yes)*
   3. *Does our climate and geography meet the requirements of growing these foods? (Yes/No)*
4. Provide a hypothetical scenario for your students.Explain that this Thanksgiving they only have access to foods that can be producedneartheir home.Grocery stores can only stock their shelves with food that was produced locally.
   1. **Note:** In this discussion you should define *near.* In most cases this will be within a 100 mile radius. Your state's Department of Agriculture website would be a good resource to identify farming industries within your state.
5. Continue a class discussion using the following questions:
   1. *Why are some foods unavailable?*
      1. Answers will vary depending upon the food item and your location. Possible answers may include lack of open space to grow a crop or raise animals, lack of available water, or a climate with a growing season that is too short.
   2. *What factors limit a farmer's ability to grow foods such as grains, fruits, and vegetables?*
      1. Open space with fertile soil
      2. Water
      3. Climate and length of growing seasons
   3. *Are there some geographic locations in the United States that are better suited for the local production of food than others?*
      1. Yes. Explain that geographic areas with plenty of fertile soil, moisture, and a temperate climate are likely able to produce a large variety of crops and livestock. These areas can provide a large variety of locally grown food. In contrast, geographic areas with colder climates and shorter growing seasons are limited in the crops they can produce. As a class, determine on a scale of one to ten how suitable your area is for eating only locally produced food.
   4. *Does technology exist which can help farmers produce local food in areas where it can't naturally be grown?*
      1. Yes. For the production of some plant based foods, greenhouses can significantly extend the growing seasons in colder climates by artificially creating the ideal environment for year round plant growth.
      2. In large cities where open space is a limiting factor, vertical gardens and greenhouses can be implemented.
      3. Science can also be used to select and use varieties of plants that require shorter growing seasons or that are more tolerant of local temperatures (heat or cold).
      4. Aquaponics, hydroponics, and aquaculture are non-traditional methods of producing food using various forms of water, instead of soil, for plant growth. These cultivation methods are being used more and more in some areas.
   5. *What factors limit a farmer's ability to raise livestock animals that provide meat, milk, and eggs to our diet?*
      1. Open space
      2. Access to affordable feed
      3. Close access to markets to sell livestock.

Activity 2:

1. In *Activity 1*, students should have gained a basic knowledge of the portion of their Thanksgiving dinner that is (or could be) produced locally. In this activity, students will learn the geographic areas in the United States that produce the highest quantities of each agricultural crop or commodity and why.
2. Explain to students that a farmer's goal is to produce a product that is nutritious and economical for consumers. With these two goals in mind, farmers take many factors into consideration when choosing a location for a farm as well as the farm's overall capacity to grow crops and livestock for our food. We will discuss three factors.
3. Use the following examples to illustrate geographic and agricultural correlations in the production of our food.
   1. **Climate:** Citrus fruits such as limes, lemons, oranges, or grapefruit are a good example of an agricultural crop grown in a specific place to utilize its climate. Ask students if they know where citrus fruits are grown in the United States. Display the [Citrus Map](http://www.nefbmap.org/map.php?P=22&PV=0) for students to see. Point out the map legend so that students recognize the color coding. They should identify that only four states produce a significant amount of citrus fruits. Ask the following questions:
      1. *Which states produce citrus fruits?*
         1. California, Florida, Texas, and Arizona.
      2. *What do the four citrus producing states have in common?*
         1. They have a tropical or subtropical climate and warm temperatures year round.
      3. *Why aren't citrus fruits grown in other areas of the United States?*
         1. Citrus trees are sensitive to frost. Cold temperatures can result in loss of a fruit crop and even kill the tree.
      4. Why aren't greenhouses and other technologies utilized to grow citrus fruits in other states?
         1. While greenhouses can provide an ideal climate for plant growth, they are very expensive to build and maintain. The cost to produce citrus fruits in a greenhouse would be much greater than simply growing them in the ideal environment and climate and then shipping the fruit to the consumer.
   2. **Resource Availability:** Hog Production is an example of an agricultural commodity being produced in the same area as one of it's necessary resources. Pigs are raised for their meat, known as *pork.* Their primary diet is corn. Display the [Hog and Corn Production Maps](http://nefbmap.org/map.php?M=7&MV=0&P=39&PV=0). Ask your students the following questions:
      1. *What are the top 5 hog producing states?*
         1. Iowa, North Carolina, Minnesota, Illinois, and Indiana
      2. *What are the top 5 corn producing states?*
         1. Iowa, Illinois, Nebraska, Minnesota, and Indiana
      3. *Is there a correlation between hog production and corn production? Why?*
         1. Yes. Corn is the primary diet for pigs. It is economical to raise pigs close to where their feed is grown. This decreases production costs for the farmer allowing the cost of food to be lower. Note: Most large scale pig farms utilize climate controlled facilities to keep their pigs cool in the summer and warm in the winter. Consequently, pig farms are not restricted to being located in a specific climate.
   3. **Available Space:** Space is necessary for farmers to raise animals and grow crops. As a class, compare the [Farmer-operator and Geographic Area Maps.](http://nefbmap.org/map.php?M=0&MV=0&P=44&PV=0) Notice that California and Texas are among the largest sized states and have some of the highest numbers of farmers. Display and study the [Beef Cow and Geographic Area Maps](http://www.nefbmap.org/map.php?M=0&MV=0&P=35&PV=0) and the [Beef Cow and Acres of Pastureland Maps](http://nefbmap.org/map.php?M=43&MV=0&P=35&PV=0). Ask your students the following questions:
      1. *Can you see any correlations between the geographic area of a state and their beef cattle production?*
         1. Yes. Beef cattle require more living space than other livestock species. Most beef cattle spend the majority of their lives grazing pastures and rangelands. Larger states have more likelihood of having fields, pastures, and rangelands for cattle to graze.
      2. *Notice that Nevada, Arizona, Utah and New Mexico rank among the largest states, but they are not high producers of beef cattle. Can you guess what one limiting factor might be?*
         1. Moisture. If your students need a clue to answer this question, show them the [Rainfall and Beef Cow Maps](http://nefbmap.org/map.php?M=35&MV=0&P=50&PV=0). These four states are located in a desert region and have some of the driest overall conditions. Lack of rainfall decreases the amount of grazing available for cattle feed, thus decreasing the total number of cattle that can be raised per acre.
4. At this point your students should have an understanding that our food is typically produced by farmers in geographic areas that have ideal climates, necessary resources (fertile soil, moisture, feed, etc.), and adequate space. With this knowledge they are prepared to complete The *Geography of My Thanksgiving Dinner* activity. Print the [attached document](https://cdn.agclassroom.org/media/uploads/2016/11/18/The_Geography_of_Thanksgiving_Food_Cards.pdf) front to back. This will make 12 sheets of paper, each representing 1 ingredient for Thanksgiving dinner.
5. Divide your class into 12 teams of two or three students. Assign each team one food item by giving them one of the twelve food cards.
6. Instruct students to follow the instructions on their paper. Provide internet access and allow class time for students to research the questions and complete the activity. If you have additional time, you may wish to assign students a more in-depth look at their food item. Use either of the following ideas to deepen their understanding of the production of their food:
   1. Make a presentation using visual aids such as PowerPoint, Prezi, or other presentation style to illustrate the steps of food production from the farm to their plate.
   2. Assign students to find a short and appropriate educational YouTube video to share with the class about the production of their food. Watch the video clips as part of their presentations. Be sure to preview each video prior to their presentation.
7. After an appropriate amount of preparation time, ask each team of students to present what they have learned to the class.
8. While students are presenting, project the attached [Thanksgiving Dinner Map](https://cdn.agclassroom.org/media/uploads/2015/10/22/Thanksgiving_Dinner_Map.pdf) on the board. Have each group color in and label the state that produces the most of their assigned food. 

**Concept Elaboration and Evaluation**

After conducting these activities conclude and summarize the following key points:

* Farmers aim to produce food that is economical and nutritious.
* Many farm commodities thrive in specific geographic locations and/or climates. Therefore, farms produce large quantities of food in these areas and ship it throughout the nation.
* The ability to transport food from the grower to the consumer allows for a diet with many different foods and offers food at a lower cost.
* Depending on the location, limiting diets to locally grown food will decrease the varieties of food and nutrients in our diet.
* Thanksgiving dinner will likely represent food grown in many regions of our country. Some food may even be grown outside of the country.

Additional Learning Procedures

To help students review and elaborate more about sweet potatoes, try using the [“I used to think…Now I think…”](https://drive.google.com/file/d/12MaUo7phKbgMFUQGD4wRJQpuY20taEej/view?usp=drive_link) method to allow students to think deeper and make new connections.

Additional Resources to Include:

[A Weed Is a Flower](https://agclassroom.org/matrix/resource/119/)

[The Geography of Thanksgiving Dinner](https://agclassroom.org/matrix/lesson/367/)

[Thanksgiving Maps and Posters](https://agclassroom.org/matrix/resource/572/)



Source: <https://www.agclassroom.org/teacher/matrix/>

*For more information and additional lessons visit*

*https://msfb.org/ag-in-the-classroom/lesson-plans/.*