

Mapping Meals

Grade 5

► **Next Generation Science Standard: 3-5-ETS1-2**

Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.

Application: Because of advances in farming, food processing, and the ability to import foods from around the world, various foods are available every day, no matter where you live. Without these advances, many of us would be able to buy some types of food for only a short time each year.

Materials for the class:

- assorted orange juice containers
- Internet or library access
- large world map outline
- large United States map outline

Teacher preparation:

Ask students to bring in orange juice containers from home. These can be bottles, cartons, or cans from concentrate.

Introducing the lesson:

Farmers around the world grow the food we enjoy every day. There are three basic steps to get food from the farm to the dinner table:

- *Production* involves growing the food on a farm.
- *Processing* is what happens to the food once it is ready to be picked. This is when oranges are juiced and the juice is put in a carton or bottle and juice from concentrate is put in a can.
- *Transportation* involves taking the food to the store.

Lesson:

1. Display the orange juice containers for the students to observe. Point out the word *concentrate* on some of the containers.

Ask students:

- What is the difference between regular juice and juice concentrate? Allow time for some quick research if necessary. *(The difference is how the fruit is processed. Juice that is not from concentrate means the fruit is squeezed and strained; then the juice is pasteurized, blended, and chilled. Finally, the juice is packaged in cartons. Juice from concentrate means the fruit is squeezed and much of the water is evaporated. The juice is pasteurized and canned for sale.)*
- What does *pasteurized* mean? Why is it important? *(Pasteurization is the process of heating the juice to a high temperature for a short amount of time to kill any harmful bacteria, which helps ensure food safety. As the juice is pasteurized, some natural orange components may become separated; then, after pasteurization, orange oil or orange pulp may be added back into the juice.)*



Did you know? About 80 percent of America's orange juice comes from oranges grown in Florida. Florida oranges are in season from October to June, although some varieties are available from December through May. Florida is second only to Brazil in global orange juice production.



2. Ask students to read the food labels. Ask them to point out which labels mention “pasteurization.” **Ask students:**
 - In what state or country was the orange juice made? Record all the observations on the board.
3. Break the class into small groups. Have them research the locations and climates of the states and countries where the orange juice came from.
4. Discuss the students’ findings and label the various states and countries on blank maps. Calculate the distance that the orange juice was shipped to get to your town. **Ask students:**
 - What do the places where oranges are grown have in common? (*They are warm places where it doesn’t get too cold at night and where frost isn’t prevalent. Different types of oranges grow in different places.*)
 - What is the farthest distance from where the orange juice was made to your school? The closest?



Think about it. If we couldn't transport foods around the globe, our food selection would be much more limited. Think about the foods grown in your area. What might your menu look like if those were the only foods that you could choose?

