

Grade Level: 4

Title: How Did the Berries Get Here?

Purpose:

The purpose of this lesson is for students to develop an understanding of the journey from field to consumer by studying the process of harvesting, sorting, packaging, storing, transporting, and purchasing.

Subject Area(s) Addressed:

ELA

Common Core/Essential Standards:

ELA

4.RIT.3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

4.RIT.9. Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.

4.W.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

a. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.

b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.

c. Link ideas within categories of information using words and phrases (e.g., another, for example, also, because).

d. Use precise language and domain-specific vocabulary to inform about or explain the topic.

e. Provide a concluding statement or section related to the information or explanation presented.

4.W.7. Conduct short research projects that build knowledge through investigation of different aspects of a topic.

Vocabulary:

commercial

farmers' market

harvest(ing)

mature (maturity)

packaging

packing

pint

purchasing

quart

ripe

roadside stand

sorting

storage

storing

transporting

Materials Provided:

“Flow Maps”
“Blank Flow Map”

Materials Needed:

writing journal
Internet access

Teaching Strategy:

Ask students "How do jelly makers get the strawberries they need to make strawberry jelly?" "How does your family get its strawberries?" "How can we just walk in the store and buy fresh strawberries?" Allow students to brainstorm these ideas.

Then, lead students into a discussion on what happens to the strawberries once they leave the field. Record their responses on the board in any order.

Next, based on the student responses, the teacher may have to fill in the gaps by asking questions to generate steps such as packing and storing. The teacher may use the “Flow Map,” as a guide to this discussion. Students may be given copies of the “Blank Flow Map” (or asked to create their own). Students will work with each other to come up with the stages from the field to the commercial sale site (grocery store, roadside stand, strawberry product manufacturing companies, etc.). Students will use a word processor to create their essay and they may choose to include pictures representing each stage of the process. They will research each stage and add a minimum of 3 details to each stage in order to write a summarizing paragraph for each step. Provide students with websites to conduct research.

The teacher will need to model the writing process from the flow map to the paragraph if this is the first time using the flow map. The paragraphs will then be compiled into a single essay explaining the strawberry's journey. The stages of the process should be the basis for the main idea of each paragraph. Students should read and paraphrase the details to support the main idea.

- **Harvesting:** Focus on how and when harvesting takes place.
- **Sorting:** Focus on the sorting process taking place in the field.
- **Packing:** Focus on the packing process taking place in the field.
- **Storing:** Focus on keeping the temperatures at the appropriate temperature. *Helps prevent post harvest disease.
- **Transporting:** Focus on time from field to store (commercial).
- **Purchasing:** Focus on where to purchase and how to choose the best strawberries.

Extension Activity:

Strawberries have a short season in North Carolina as well as short shelf life. They follow many different paths from field to fork. Have students research how we are

able to buy "fresh" strawberries in the grocery store year-round. This will lend itself to a discussion on imports and exports and the concept of "food miles" – the miles a food must travel from farm to fork.

Background Information:

Part 1:

Harvesting

Videos of two larger NC strawberry farms that sell to supermarkets:

<http://www.youtube.com/watch?v=Hgub0tSLOCw>

<http://www.youtube.com/watch?v=-R2m0xmxnac>

How to pick information for consumers:

www.ncstrawberry.com/docs/posterhandoutslettersize.pdf

www.ncstrawberry.com/docs/care.htm

"Proper picking, grading, and packing are as essential as good cultural practices to success. The harvest frequency and duration depend on weather conditions, cultivars, soil factors, and cultural practices. Strawberries are almost entirely hand picked. As a general rule for wholesale operations, six to nine pickers are needed for each acre. Pickers must be instructed by a competent foreman about proper picking (to prevent plant injury), fruit handling, and sorting (grading) in the field. The berries must be picked at the proper stage of ripeness (maturity). Harvest only berries that are red. Berries still showing white should be left for the next picking. The fruit is usually harvested every other day unless hot weather makes daily picking necessary."

<http://www.extension.umn.edu/distribution/horticulture/M1238.html>

Strawberry Picking Robot

Labor is a major expense and it is often difficult to find workers. Is there an alternative? This website shows how commercial farmers are testing machinery to harvest strawberries: <http://strawberryplants.org/2010/10/strawberry-picking-robot/>

Part 2: Sorting

Most strawberries sold in supermarkets are handpicked and sorted and packaged in the field, with additional quality checks before they go into refrigerated storage. Pickers are trained not to pack fruit that is not ripe enough, overripe, damaged, or diseased.

Part 3: Packaging

Strawberries in supermarkets are generally sold in quart or 1-lb clear plastic lidded containers (known as "clamshells"). These are usually filled by the pickers as they pick and placed in shallow fiberboard boxes which hold 8-12 clamshells. This system means the flats can be easily which can be stacked and palletized and moved with a forklift from truck to storage to truck to store.

Farmers selling direct to the public in NC use quart "pulp cups" (usually green) or clamshells as well as larger containers: buckets, baskets, or boxes that usually hold about 4 quarts of berries.

Part 4: Storing

Strawberries last longer if they are refrigerated as soon as possible after they are picked. Farms that sell directly to the public try to sell fruit the same day as it is picked. Pick-your-own customers should get their berries home and into refrigeration as soon as possible and especially avoid leaving them for any length of time in a hot car.

Larger growers who wholesale berries always chill their berries. They must follow more complicated refrigeration processes, as it takes special measures to remove “field heat” from large quantities of fruit. Fruit is picked during the early part of the day and moved as quickly as possible to a cooling house. The flats of berries are stacked on pallets and large fans are used to pull chilled air through them (known as “forced air cooling”). Once the berries have reached 34 degrees F, they are placed in a refrigerated storage room, where this temperature can be maintained. The humidity must also be monitored and maintained, as the berries can lose moisture under refrigeration.

Part 5: Transporting

Strawberries that have been chilled must maintain a cold temperature in transit. They will last longer if this “cold chain” is unbroken. Refrigerated trucks are used for this. It can take many days for a strawberry from California to reach a consumer in North Carolina. Some of that time is on the road, but the flats of berries also spend time in grocery chain distribution centers and in the supermarket’s own coolers before being put on the shelf.

Food miles is a term which refers to the distance **food** is **transported** from the time of its production until it reaches the **consumer**. Food miles are one factor used when assessing the **environmental** impact of food, including the impact on **global warming**. http://en.wikipedia.org/wiki/Food_miles. Efforts to produce more food locally and consumers interest in “Buy Local” are evidence of concern over a more sustainable, locally based food system. On the other hand, there are also costs and inefficiencies in local food systems (such as having many consumers drive to a farm to buy small quantities) and some foods can only be produced – or produced economically—in certain regions of the country or the world. There are many sources for additional discussion of this concept. Here are a few:
<http://food-hub.org/files/resources/Food%20Miles.pdf>
<http://www.foodmiles.com/> a Food Miles Calculator
<http://www.ens-newswire.com/ens/nov2002/2002-11-21-06.asp>

Part 6: Purchasing

There are many options for where to purchase strawberries. They are available at local farmers' markets, roadside stands, pick your own farms, and grocery stores. Each option has advantages and disadvantages – for both the farmer and the consumer. Growers often combine several different kinds of marketing – pick-your-own, direct sales of prepicked berries on the farm or at a farmers market or stand, and sales to stores/wholesale—and different combinations work for different

growers. For our smaller growers, cutting out the middleman and selling direct to the public, whether pick-your-own (PYO) or picking for them, generally gives the most success as the packing/cooling requirements of wholesaling and competing with California's large yields, economics of scale, and ability to supply year-round are tough. The price paid by wholesale buyers is less than that paid by consumers. The prices growers charge to consumers at their stand may be lower, higher, or the same as berries in the store depending on many factors.

Berries are cheaper PYO for consumer... but these consumers also invest lots of labor and travel, while they also benefit from having fun and getting the freshest berries.

Additional Resources:

Videos of Strawberry Production:

Large-scale strawberry production/harvest/moving berries (in California):

<http://www.youtube.com/watch?v=ppDdjQug3n0>

Meet your Neighbor: produced by Harris Teeter, talk about wholesale, show farmworkers. May want to show without the sound so not promotional:

Cottle Farms (NC), <http://www.youtube.com/watch?v=-R2m0xmxnac>

Lewis Nursery and Farms (NC) <http://www.youtube.com/watch?v=Hqub0tSLOCw>

Post-harvest handling information from NC:

<http://www.bae.ncsu.edu/programs/extension/publicat/postharv/ag-413-2/>

<http://plantsforhumanhealth.ncsu.edu/2012/08/17/%E2%80%9Cpack-%E2%80%98n-cool%E2%80%9D-provides-farmers-with-mobile-refrigeration-solution/>

Consumer information on Strawberry Care:

<http://www.ncstrawberry.com/docs/care.htm>

Tips on choosing the best strawberries:

<http://www.wikihow.com/Buy-Strawberries>

NCSA How to Pick Poster:

<http://www.ncstrawberry.com/docs/posterhandoutslettersize.pdf>

Strawberry Fact Sheet:

<http://postharvest.ucdavis.edu/PFfruits/Strawberry/>

Assessment:

Completed flow map

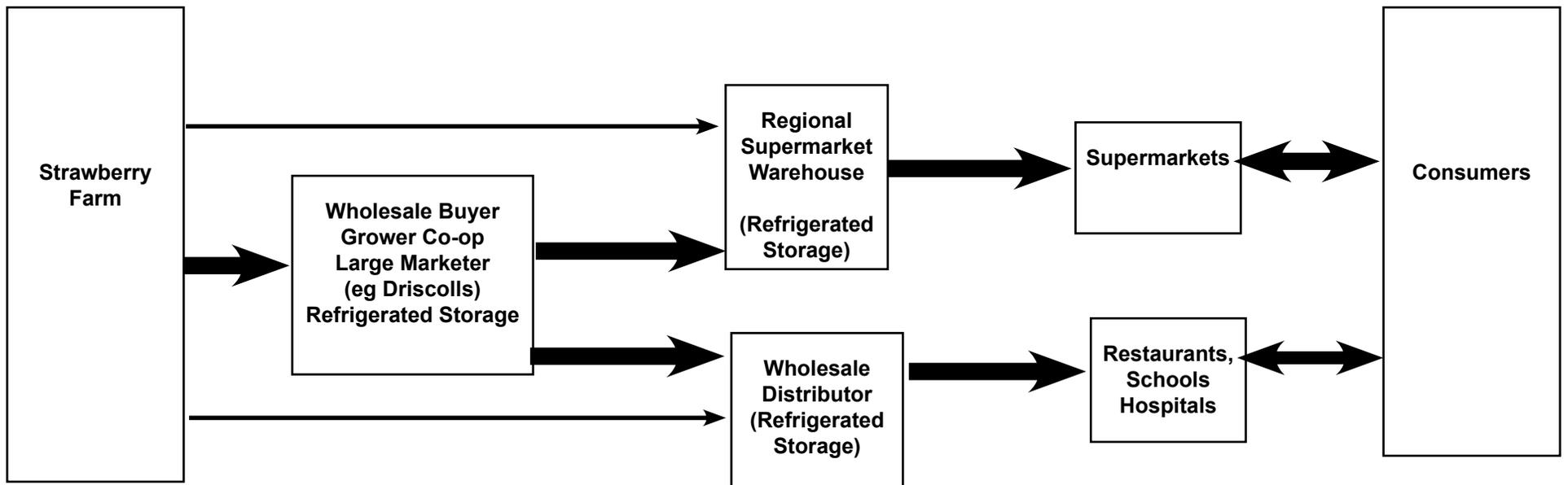
Essay

North Carolina Strawberry Association – www.ncstrawberry.com

This project was supported by the North Carolina Department of Agriculture and Consumer Services Specialty Crop Block Grant Program.

Standard Wholesale Marketing (most of produce industry)

Produce sometimes travels many miles between farm and final user.

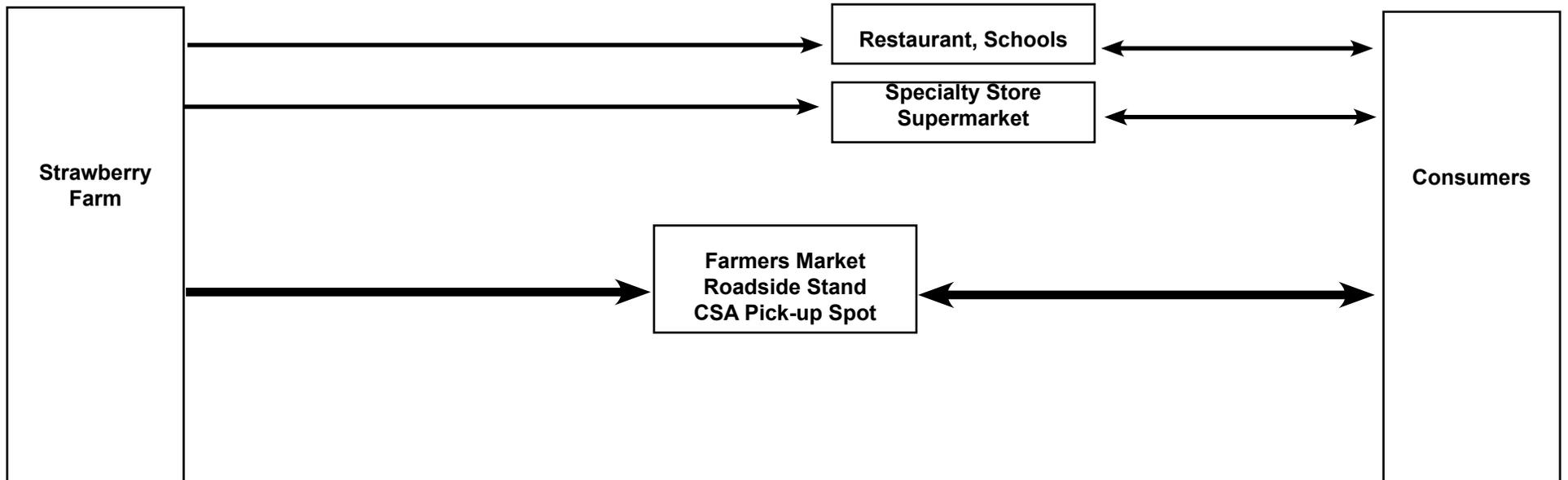


Off-Farm Local and Direct Sales

Farmer sells to local stores, restaurants, etc.

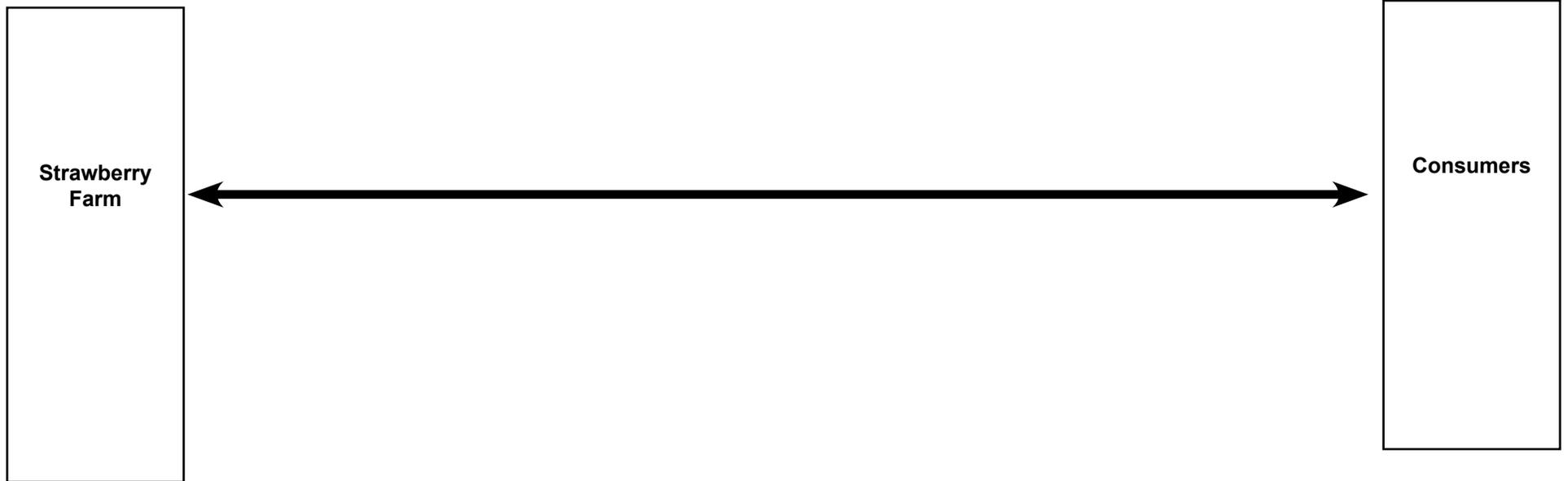
OR

Farmer takes berries to a convenient location and sells direct to consumers.



On-Farm Direct Sales

Consumers visit the farm and pick their own berries or buy ones the farmer has already picked



Flow Map for Students

Name _____

Here is how a strawberry gets from the strawberry farm to my house.

