



Making Sense of Wisconsin Agriculture Educator Guide

Lesson Overview:

Students will explore and taste-test freeze-dried and dried Wisconsin agricultural products to understand the process of freeze-drying and gain awareness of agriculture.

Essential Question:

What is food processing and how do foods change during the process of freeze-drying?

Lesson Breakdown (Based 60-minute class period)

- Engage: Introduction (5 minutes)
- Explore & Explain: Reading Activity (10 minutes)
Sensory Lab (30 minutes)
- Evaluation: Group Discussion (5 minutes)
Conclusion (5 minutes)
- Elaborate: Rehydrate Samples
Graph and analyze results

Subjects

- Science
- Technology
- Engineering
- Math
- ELA
- Nutrition
- SS

Grade Level

- K-2
- 3-5
- 6-8
- 9-12

I CAN statements

- define key vocabulary related to food processing.
- describe different types of Wisconsin specialty crops.
- Describe different types of food preservation methods.
- conduct a sensory evaluation of different types of processed specialty crops.
- explain how food processing can preserve and keep foods safe.
- communicate my findings in a clear concise way.

Performance Expectations/ Standards

Social Studies

SS.Econ4.a.3

Trace the chain of supply for a needed product

SS.BH4.a.i

Classify technologies based on intended use, access, and design, and how they might change people's lives (for better or worse).

Science

SCI.SEP1.B.3-5

Students ask questions and define problems, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.

SCI.ETS2.B.3-5

People's needs and wants change over time, as do their demands for new and improved technologies.

Nutrition

ICF1.c.2.i: Explain how food changes during processing

Educator Background:

Before the industrial revolution, people consumed food that was locally grown, limiting their diets to what their climate could support. Today, food production has expanded globally, allowing produce to travel thousands of miles

before reaching consumers. The farm-to-table process includes five key steps: farm, processing, transportation, market/retail, and table. After harvesting, fruits and vegetables are either packaged for sale or preserved through methods like freezing, canning, or drying. This system ensures a year-round supply of diverse produce, regardless of regional growing conditions. However, different crops require specific climates and soil conditions. Tropical fruits like oranges and bananas need warm temperatures, while root vegetables such as carrots and turnips thrive in cooler climates. Modern transportation enables consumers to access a wide variety of produce from different regions around the world.

Fruits and vegetables are essential for a healthy diet, as recommended by MyPlate, which suggests they make up half of each meal. They provide vitamins, minerals, fiber, and antioxidants, which support overall health and help prevent disease. Nutrient-dense foods offer high nutritional value with relatively low calories, while foods high in calories but low in nutrients are considered empty calories. To ensure year-round consumption, humans have developed preservation methods over the past 12,000 years, including drying, canning, and freezing. While these techniques extend the shelf life of produce, food preparation can impact nutrient retention. Cooking methods that use less water and shorter cooking times, such as steaming or microwaving, help preserve vitamins and minerals, ensuring that fruits and vegetables maintain their nutritional benefits.

Essential Vocabulary

- Specialty Crop
- Commodity Crop
- Food Processing
- Preservation
- Fermentation
- Irradiation
- Canning
- Freezing
- Drying
- Freeze-Drying
- Processed food

Materials (per student)

- Freeze-dried and Dried Wisconsin agricultural products
Beans, Peas, Corn, Blueberries, Cherries, and Cranberries
- **Making Sense of Wisconsin Agriculture Worksheet** for each student
- **Sensory Recording Worksheet** for each student
- Water for rehydrating samples (optional)
- Napkins or paper towels
- Whiteboard and markers
- Projector for multimedia resources
- **Exploring Wisconsin Agriculture E-Learning Module** (Optional)
- **Agriculture Across Wisconsin** poster (Optional)
- **Exploring Wisconsin Agriculture Mini Ag Mag** (Optional)

Making Sense of Wisconsin Agriculture

Time	Materials	Activity
5 mins	Optional: Exploring Wisconsin Agriculture E-Learning Module Agriculture Across Wisconsin Map Exploring Wisconsin Agriculture Mini Ag Mag	Engage: Begin by reviewing the presentation “Expedition Wisconsin Agriculture with Alice in Dairyland” with a brief discussion about local agriculture in Wisconsin. Highlight the importance of agriculture in the state's economy and the variety of products grown by reviewing the animals, crops and processed goods presented in the lesson. If students did not participate in the presentation, utilize Exploring Wisconsin E-Learning Module – Agriculture Across Wisconsin Map and/or Exploring Wisconsin Agriculture Mini Ag Mag .
10 mins	Making Sense of Wisconsin Agriculture Student Worksheet	Explore and Explain – Reading Activity Hand each student a copy of the worksheet, “ Making Sense of Wisconsin Agriculture ” Explain that Wisconsin farmers grow a variety of crops that are harvested during the spring, summer and fall months. Explain

		<p>that these crops need to be preserved to ensure the longevity and safety of the foods so they can be eaten during non-growing months.</p> <p>Guide the students through Making Sense of Wisconsin Agriculture reading passages “Diverse Specialty Crop Production in Wisconsin” and “Understanding Food Processing: From Farm to Table”.</p> <p>Discuss the following questions:</p> <ul style="list-style-type: none"> - “What are some of the specialty crops grown in Wisconsin?” - “What is food processing? List some examples.” - “Why is food processing important in providing safe foods for us to eat year-round?” - “What are some of the potential downsides of food processing?” <p>Guide in discussion of these questions and further explain the types of preservation and foods that they may have eaten that are preserved or processed.</p>
30 mins	<p>Making Sense of Wisconsin Agriculture Worksheet</p> <p>Sensory Recording Sheet</p>	<p>Explore and Explain – Sensory Lab</p> <p>Introduce the Essential Question: What is food processing and how do foods change during the process of drying and freeze-drying?</p> <p>Hand each student a copy of the Sensory Recording Worksheet.</p> <p>Explain that they will be taste-testing different types of freeze-dried specialty crops to determine how freeze-drying impacts the crop’s appearance, texture and taste.</p> <p>Explore and Explain – Sensory Lab</p> <p>*Before beginning the lesson, be sure to evaluate potential allergens of students and products and ingredients.</p> <p>Review the procedure before allowing students to begin:</p> <p>Procedure:</p> <ol style="list-style-type: none"> 1. Setup: <ol style="list-style-type: none"> a. Divide the class into small groups of 4-5 students) b. Provide each group with a sample of each type of freeze-dried products. c. Have students read through the procedure on the worksheet “Making Sense of Wisconsin Agriculture”. 2. Observations <ol style="list-style-type: none"> a. Ask the students to observe the samples to the pictures on the front of the “Making Sense of Wisconsin Agriculture” worksheet.

		<p>b. Instruct students to carefully observe the appearance, texture, and any noticeable changes in the freeze-dried products. Ask students, “What differences do you notice?”, “What could have caused these changes?”</p> <p>c. Have students record their observations on the “Sensory Recording Sheet”.</p> <p>3. Tasting</p> <p>a. Instruct students to follow the instructions on the Making Sense of Wisconsin Agriculture worksheet and taste the products.</p> <p>b. Remind students to record their observations.</p> <p>4. Analysis</p> <p>a. Once all samples have been tested, instruct students to select their favorite specialty crop sample, and write a statement about their favorite taste-test food in the space provided on the Making Sense of Wisconsin Agriculture worksheet.</p> <p>5. Reflection</p> <p>a. Bring the class back together for a group discussion. Ask each group to share their observations and opinions about the freeze-dried products.</p>
5 minutes		<p>Evaluation:</p> <p>Discuss the advantages and disadvantages of freeze-drying, considering taste, nutritional value, and preservation qualities.</p> <ul style="list-style-type: none"> ● Guide students in connecting the discussion to the broader concept of sustainable and local agriculture. ● Encourage students to reflect on the importance of the role of food processing in preserving food grown by farmers. <p>Summarize the key points of the lesson, emphasize the types of food processing and different types of Wisconsin Specialty crops and agriculture.</p> <p>Conclude with a class reflection on the tasting experience and its implications for making informed food choices.</p>

Sources:

1. <https://www.wisagclassroom.org/matrix/lesson/668/>
2. <https://www.wisagclassroom.org/wiag/>

Author

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Organization

Wisconsin Agriculture in the Classroom