

SC Farm Bureau
Ag in the Classroom
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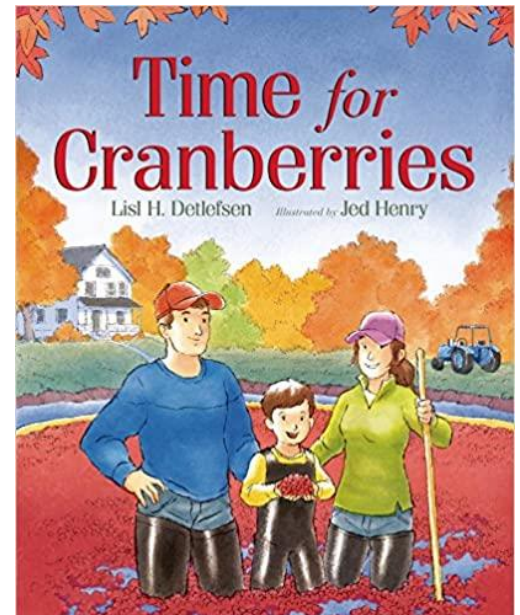
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November 2021

Time for Cranberries

By: Lisl H. Detlefsen

From the cranberry bog to the Thanksgiving table, join Sam and his family as they harvest a classic American fruit. When the vines hang heavy with berries that the autumn winds have turned deep red, it's time for cranberries, and Sam is finally old enough to help with the harvest! This charming, lyrical picture book follows Sam and his family as they raise the water in the bog, pick the cranberries, and gather the fruit for processing. It's a story of modern family farming in action, showing readers where their food comes from but mostly delighting them along the way. ¹



Did You Know? (Ag Facts) ²

- Cranberries are perennial plants. That means they are planted one time and grow back every year.
- In the US, cranberries are grown in Massachusetts, New Jersey, Wisconsin, Washington and Oregon.
- Cranberries were eaten at the first Thanksgiving in Plymouth, Massachusetts.

Discussion Questions

- When does your family eat cranberries?
- Why are cranberries not grown in South Carolina? Where are they grown?
- What animals could live in the cranberry marsh ecosystem?

Scan the QR code or click here
for ready to use slides.



Grade Level(s): K-5

Purpose: Students will explore cranberry production as well as how farmers utilize natural resources (water) to harvest this crop of fruit.

Vocabulary:

- bog - wet, spongy soil
- ecosystem - all of the living and nonliving things in an environment
- perennial - a plant that bears leaves and flowers every year

Background Agricultural Connections: ²

The berry that is associated with cranberry sauce and cranberry juice, grows from a plant in the genus *Vaccinium* (Species, *Maccrocarpum*). They are only one of three fruits native to North America, blueberries and concord grapes are the others. This genus includes a wide variety of other fruit-bearing plants from all over the world, including the blueberry, the huckleberry, and the lingonberry.

The colonists were introduced to the cranberry's usefulness by the Native Americans who not only ate the berry raw, but also used it in sauces, puddings, breads, and a high protein, "to go" meal called pemmican. Pemmican was a mixture of dried strips of meat or fish, fat, and berries that had been pounded into paste. The mixture was then shaped into a cake and dried in the sun. Pemmican stored well and was often used as a meal on long journeys. Not only did Native Americans use fresh and dried cranberries in their diets, but the fruit was favored as an ingredient in medicines and healing teas. Poultices made from cranberries were used in the treatment of scrapes, sores, and wounds caused by poisonous arrows. Various tribes also used the juice for coloring clothing and blankets.

In cranberry growers' circles, it is not uncommon to hear that non-growers envy the growers. "You are so lucky," a community member might say. "You only have to work in the fall!" This view of cranberry growing—presumably due to the highly visible work of the autumnal harvest—couldn't be farther from the truth. In fact, cranberry marshes, like other farming systems, are always in a delicate balance, requiring growers to devote constant attention to them. Because the cranberry is a perennial, this means year-round attention. Each season has its own tasks and challenges. To meet these challenges growers, like other farmers, rely on various technologies (tools and processes).

For example, **autumn** is the most obvious time of activity on a cranberry marsh: it's harvest time. The grower must coordinate transportation systems, people, and machinery to accomplish harvest and ensure that the cranberries are examined and packaged for sale. Mechanized harvesters replace the old fashioned, long-handled rakes once used for hand harvesting, and mechanical sorters separate high berries from those unacceptable for fresh fruit consumption. Berry growers use sprinklers, water management systems, boats, water reels, corrals, pumps, and conveyors to flood the bogs, agitate the vines, and gather the berries. Trucks transport the cranberries from the marsh.

Each of the other seasons brings unique tasks. While **winter** may be a quiet time for growing, the vines still require care. The marsh must be flooded with a protective layer of water that will freeze over, preventing the vines from sub-zero temperatures and blustery winds. Meanwhile, the growers must take care of bookkeeping, professional development, and maintaining both the marsh and machinery. Spring and summer bring new work. In the **spring**, growers are busy

preventing damage from spring frost, insects, weeds, and disease, as well as renovating and constructing bogs. They also attend to the important task of promoting pollination. In the **summer** growers attend to irrigation and continue to manage weeds and harmful insect populations.

While each season brings its special concerns, **throughout the year** cranberry growers must pay special attention to the amount of rain fall and respond to water levels. Contrary to the common belief that vines must be saturated, vines require good drainage. It is critical to prevent too much water accumulation around the cranberry vines during blossom development or during berry growth. The sun warms the water, and the water will burn the developing blossom and berry growth. Once burned, the growth may be destroyed and there may be no crop that growing year. Too much water will also promote disease to the vines and berries. Of course, the water levels will be crucial during autumn's harvest. Harvesting requires water to protect the fruit from freezing on low temperature nights, and for the raking flood which allow cranberries to float enabling the machines to easily remove the fruit from the vine.

Technology also helps growers as they adjust and pass water throughout the marsh. Water control structures such as flumes and bulkheads allow the grower to move water via a series of planks that can be added or removed to adjust the water level. Each season is critical; the cranberry grower must pay special attention to marsh the each day.

Making Sense of Cranberries ²

Materials:

- Whole, fresh cranberries (These are typically sold only in the fall, but keep for several months in the refrigerator, so consider purchasing ahead of time)
- Various processed cranberry products, such as:
 - Cranberry sauce and/or preserves (3-8 oz.)
 - Cranberry juice cocktail (red and/or white)
 - Cranberry chutney
- Plastic knife (1 per group)
- Small paper cups (3 oz., 3-7 per student)
- Water
- Serving spoons (3 per student) or enough for each student to taste each product without reusing a spoon. Teacher may consider alternate method of distributing samples for tasting.
- Can opener (for cranberry sauce in a can)
- Paper plate or substitute (1 per student)
- Graph paper
- Student Worksheet – Cranberry Observation Chart 2: Comparing Fresh, Whole Cranberries (Raw Material) versus Processed Cranberry Products (1 copy per group)
- [Class charts for recording](#) (Use on projected screen. i.e Promethean Board, SmartBoard, etc.)

Procedures:

1. Invite students to get to know cranberries. Ask them to generate a list of things that come to mind when they think of cranberries. It may make sense to begin by polling the class to see who has/has not seen a cranberry before, especially if you are not from a cranberry growing region.
2. Frame the lesson's exploration by pointing out that often we do not have a chance to really get to know something through all of our senses, but that they will get to know cranberries in this way.
3. Divide the class into small groups (3-4 students). Give each group a small handful of fresh, whole cranberries with a cup of water. Invite them to explore them for a few minutes, in any way they like, keeping the cranberries confined to their group area.
4. Guide students to explore the cranberry through each sense. Provide a few minutes for each sensory exploration and then collect student group observations on the class chart. While students are exploring, encourage them to make careful observations by asking guiding questions such as those suggested below.
 - Take a *look* at your cranberry. What are the shades and colors, shapes, dimensions you see? What details do you notice? Will it float? How are any two cranberries alike? Different? Slice one cranberry in half. What do you see?
 - *Touch* and hold and move the whole cranberries around in your hands. What does a cranberry feel like? How would you describe the texture? Is the berry firm, smooth? Is it the same everywhere? Is it heavy, lightweight? How would you know you had a cranberry in your hand if you were blindfolded? What does the open cranberry feel like?
 - *Smell* the cranberry. How would describe the smell? Does it remind you of anything else? What? Is it a strong odor? Mild? Sharp? Floral? Sweet-smelling?
 - What might you do to be able to *hear* the cranberry? (Allow groups to make suggestions and try them.) What sounds do they make? Cut a second cranberry in half. Is there a sound it makes when it is cut? After it is cut, what sounds does it make? (Cranberries make audible sounds as they roll, shake, and are squeezed. [Additional resources: [video](#) showing bouncing cranberries.]
 - *Taste* a whole cranberry. [NOTE: Make sure students are tasting whole cranberries that have not yet been handled by others.] What does it taste like? Sharp? Sweet? Bitter? Tart? Meaty? Fruity? What else have you tasted that is like this?
5. Introduce to students the fact that up until now, they have explored a *raw*, whole, fresh cranberry. Discuss with them that they may be familiar with *processed* cranberry products, as well. (You may wish to discuss this from a technological viewpoint, generating other examples of raw materials and their processed products.) Tell students that for the rest of this lesson, you will explore the following questions:
 - How are some cranberry-based, processed products similar to and different from raw, whole cranberries?
 - Why might people feel it is worthwhile or valuable to process the cranberry product?
6. Provide each group with two cranberry products in small cups (use video), as appropriate to each group, and sampling cups and serving ware so that each student can taste the item. Have students explore each product as they did the cranberry. Each group should complete a copy of Observation Chart Two, and then report out, while you record student responses on the class version of the chart.

7. Invite students to speculate: What might account for some of the differences in their observations? (Processing, sweetening). Processing cranberries takes time, energy, and money. Why would people bother?
8. Wrap up the discussion by reminding students that they have explored a raw material and some of the products that come from that material.
 - Ask: Where does this raw material come from? This is a good time to preview the idea that cranberries grow on cranberry vines, grown on special farms—cranberry marshes, and that soon they will be exploring the cranberry marsh.
9. Finally, invite students to share questions they have about cranberries and record. You may wish to assign listing of questions as a journal prompt, and then ask students to report one or more questions out to the group, or you might prefer to run this as a small group discussion/brainstorm, with a large-class report-out.

Harvest Those Cranberries

Materials:

- *Time for Cranberries* by Lisl Detlefsen
- [How Does It Grow? \(Cranberries\) video](#)
- [Harvest of Cranberries video](#)
- Wonderful Water sheet
- The Cranberry Ecosystem sheet

Procedures:

1. Discuss with students what they know about cranberries. When do you eat cranberries? What have you heard about how cranberries grow? Explain to them that through this lesson they will explore how farmers harvest cranberries using water.
2. Read *Time for Cranberries* and mention the following:
 - Waders are waterproof gear that farmers wear over their pants.
 - Farmers use natural water sources from their farms to flood the marsh. Cranberries float on top of the water after the picking machine removes them from the vine.
3. Utilize the two videos to help strengthen students' understanding of cranberry growth and harvest.
4. Students will use the Wonderful Water sheet to help them respond to photographs on the Cranberry Ecosystem sheet. Students will explain what is happening in each photo of cranberry production.
5. Wrap-up the discussion by having students respond in a journal prompt about what they now know about cranberry harvest.

Extension Activities:

- [Cranberry STEAM lessons](#)
- [Ocean Spray – Meet the Farmers](#)
- [Fizzing Cranberries](#)

Suggested Companion Resources:

- [Cranberries in the Classroom](#)
- [Maine Cooperative Extension - Cranberries](#)
- [US Cranberries](#)

Sources/Credits:

1. Detlefsen, Lisl H. *Time for Cranberries*, Roaring Book Press, 2015.
2. Wisconsin State Cranberry Growers Association
3. Ocean Spray educational materials

Suggested SC Standards Met:

English/Language Arts:

- K.RI.1 Demonstrate understanding of the organization and basic features of print.
- K.RI.2 Demonstrate understanding of spoken words, syllables, and sounds.
- K.RI.6 Summarize key details and ideas to support analysis of central ideas.
- 1.RI.1 Demonstrate understanding of the organization and basic features of print.
- 1.RI.2 Demonstrate understanding of spoken words, syllables, and sounds.
- 1.RI.6 Summarize key details and ideas to support analysis of central ideas.
- 2.RI.10.1 Identify and analyze the author's purpose
- 3.RI.5.1 Ask and answer literal and inferential questions to determine meaning; refer explicitly to the text to support inferences and conclusions.
- 3.RI.8.1 Explain how the author uses words and phrases to inform, explain, or describe.
- RI.4.5.1 Ask and answer inferential questions to analyze meaning beyond the text; refer to details and examples within a text to support inferences and conclusions.
- RI.4.8.1 Determine how the author uses words and phrases to shape and clarify meaning.
- RI.4.8.2 Apply knowledge of text features to gain meaning; describe the relationship between these features and the text.
- RI.4.9.1 Use definitions, examples, and restatements to determine the meaning of words or phrases.
- RI.5.8.1 Analyze how the author uses words and phrases to shape and clarify meaning.

Science (2021 standards):

- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.
- K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs
- 2-LS4-1. Make observations of plants and animals to compare patterns of diversity within different habitats.
- 2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.
- 3-LS1-1. Develop and use models to describe how organisms change in predictable patterns during their unique and diverse life cycles.
- 3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.
- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function together in a system to support survival, growth, behavior, and reproduction.
- 5-LS1-1. Support an argument with evidence that plants obtain materials they need for growth mainly from air and water.

Observing Fresh Cranberries

Chart One

Sense	Properties of a cranberry (what you observe)
Sight	
Touch	
Smell	
Sound	
Taste	

Comparing Fresh, Whole Cranberries (Raw Material) to Processed Cranberry Products

Chart Two

Product	Similarities (How is product like whole cranberry)	Differences (How is product different from whole cranberry)

What properties of the cranberry do you think the manufacturer valued and tried to keep in the product? _____

Were there any properties that were changed during the Processing? _____

Do you think this was on purpose? ____ Why? _____



Cranberry Lessons



Group: _____

Date: _____

Making Sense of Cranberries Cranberry Observation Chart Two

Directions:

1. Your group has received two cranberry-based products. Explore one at a time, using as many senses as appropriate. (**Do not taste products that are not edible.**) Everyone in the group should make observations with each sense.
2. Then discuss how the product is similar to and different from fresh, whole cranberries. Complete the row on the chart for that product.
3. Repeat with the second product.
4. Discuss and answer the questions at the bottom of the page.

Comparing Fresh, Whole Cranberries (Raw Material) to Processed Cranberry Products Product Similarities

Product	Similarities (How product is like whole cranberry)	Differences (How product is different from whole cranberry)

What properties of the cranberry do you think the manufacturer valued and tried to keep in the product?

Were there any properties that were changes during the processing?

Do you think this was on purpose? Why?



CRANBERRIES IN THE CLASSROOM



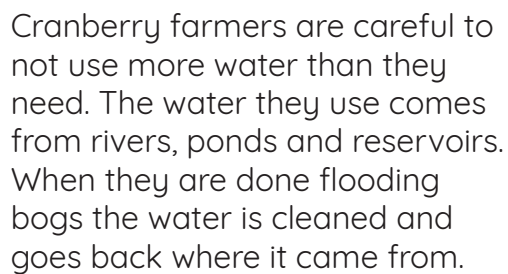
THE CRANBERRY ECOSYSTEM





WONDERFUL WATER

WATER IS VERY IMPORTANT TO GROWING CRANBERRIES

1. Water is used in the winter to flood and freeze the bogs.
2. Water is used on cold nights in the fall and spring. It makes a thin blanket of ice that coats the cranberry plants. This protects them from frost and is called frost protection.
3. Water in summer and fall growing months helps the plants stay alive.
4. Water provides a place that many animals and plants live.

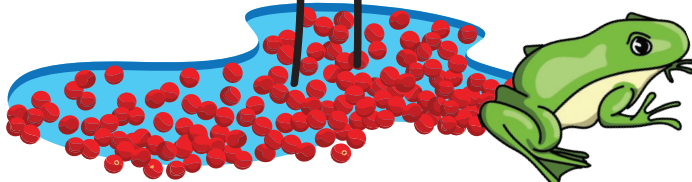


Cranberry farmers are careful to not use more water than they need. The water they use comes from rivers, ponds and reservoirs. When they are done flooding bogs the water is cleaned and goes back where it came from.



Watch this video to learn more about how water is used during cranberry harvest.

(<http://osharvest.com/>)





CRANBERRIES IN THE CLASSROOM



THE CRANBERRY ECOSYSTEM



I SPY...

Use the Wonderful Water page to complete this activity. Look at each picture. Write about what is happening. I spy with my little eye...What colors do you see? What sounds do you think there are - are the birds or frogs singing? What smells are in the air?

