Making Sense of Cranberries

A multisensory look at the properties of cranberries and cranberry products.

What makes the cranberry a useful product worth growing?

Lesson Overview

What makes a cranberry a cranberry? What about its qualities make it a valuable part of the American diet and culture? How are cranberry-based products like and different from the raw product? Answering these questions can help draw students into the study of cranberries.

This lesson orients students to the Cranberry Curriculum by inviting them to get to know and appreciate cranberries. By utilizing all five senses, they explore the nature of cranberries as whole fruits—raw materials, in fact, that are later processed for many different products. Students wrap up the lesson by connecting cranberry properties to the properties of various cranberry products. Thus the lesson creates a bridge between the cranberry itself and the themes of the curriculum, including agriculture.

This lesson also integrates nicely into technology studies in a social studies or science context; as students study the cranberry and related products, they are considering the *properties of a raw material* (cranberry), *its processed products*, and why each is considered valuable.

Background

The berry that is associated with cranberry sauce and cranberry juice grows from a plant in the genus *Vaccinum* (Family, Ericaceae). This genus includes a wide variety of other fruit-bearing plants from all over the world, including the blueberry, the huckleberry, and the ligonberry. In fact, although it is thought that English colonists were unfamiliar with cranberries until their arrival on New England's shores, the cranberry's relative, the lingonberry, was well-known.

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. As it turns out, current research, such as that conducted by the University of Maine Pathogenic Microbiology Laboratory indicates that cranberry concentrate serves as a preservative. It inhibits food borne pathogens. Native Americans also used the cranberry to make dye for their rugs and blankets and found the cranberry plant to be valuable for medicinal purposes, using it both to treat wounds (as a poultice) and to help prevent certain illnesses. Ultimately, the Native American's important berry also became a mainstay in the colonial home.

Then, as now, different aspects of the cranberry fruit itself are related to its harvesting, processing, and uses, all of which depend in part on consumer and grower perspectives on what is valuable about the fruit.

Taste: The characteristic tartness is indicative of its acidity, which in part comes from ascorbic acid —Vitamin C. Seafaring colonists recognized the berry's ability to help stave off scurvy. The cranberry was a homegrown alternative to the limes used by British mariners. In this way, cranberries became an important American fruit that contributed to a European foothold on the continent, and colonial independence, as well.

Touch: Touch a fresh, whole cranberry, and you will notice not just its round form, but also its smooth, waxy texture. This waxiness contributes to the cranberry's longevity after it is picked from the vine. This characteristic allowed it to be packed in wooden barrels and brought on long sea journeys without spoiling, as well as contributing to winter food stores.

Smell: What do you sense when you smell a whole fruit? Probably not much; the waxy coating prevents the berry from giving off much of a fragrance. Once cut, it gives off a smell that some have described as fruity or tart. Overall, compared to some fruits (bananas and oranges, for example), the smell might be considered by some to be subtle.

Sight: Take a look at a fresh, ripe cranberry and you can appreciate its attractive, vibrant shade of red, which made it a desirable and convenient source of dye. Drop it in a glass of water, and you'll see that it floats. This

enables a method of harvesting (wet-harvest) that involves flooding the bog, and beating over the vines with a harvesting wheel. In this method, the berries are wrested free and float. Then they are corralled and gathered up for delivery to processing plants. Wet berries will mold if packaged right away, so these berries are traditionally used in processed cranberry products: juices, sauces, preserved (However in some regions—such as Wisconsin—wet harvested berries are dried and then packaged whole. Processing yields the pressed, cut cranberry skins, which were once discarded—until someone realized that they could be sweetened and dried for tasty dried cranberry snacks.

Hearing: Drop a fresh, ripe, dry harvested whole cranberry on a wooden floor or cutting board, and you will both see and hear it bounce. Drop an old or damaged berry and it splats. While this may seem only to be a fun fact, in reality it impacts how berries are sorted, and which berries are processed. Fresh, whole cranberries are highly prized. Bouncing them down stairs used to be the method for selecting these desired specimens. (The discovery of this fact is attributed to John "Peg Leg" Webb, a New Jersey cranberry grower who, according to cranberry tradition, spilled a container of berries and realized he had a new method of sorting the valuable ones from the less prized.) Nowadays, sorters are based on this technique.

Materials

Whole, fresh cranberries (note: these are typically sold only in the fall, but they can keep for several months, so consider purchasing ahead of time)

Various processed cranberry products, such as:

- Cranberry sauce and/or preserves (3-8 oz.)
- Cranberry juice (or cranberry juice cocktail) red and/or white (clear)
- Cranberry chutney

Plastic knife (1 per group)

Small paper cups (3 oz., 3-7 per student)

Water

Serving spoons (1 per student who will have a chance to taste appropriate items; remember to make a spoon available for each student tasting a whole cranberry to prevent contamination from student hands.)

Can opener (if cranberry sauce is in a can)

Paper plate or substitute (1 per student)

Chart paper

Exploring Cranberries Web Resources:

Student Worksheet, Cranberry Observation Chart Two: Comparing Fresh, Whole Cranberries (Raw Material) to Processed Cranberry Products (1 copy per group)

Video Clip, bouncing cranberries

Preparation

1. If you want to use the video resource, arrange for video access.
2. Set up whole class observation charts based on the examples below. Chalkboard, white board, or chart paper is appropriate.

Observation Chart One:

Observing Fresh Cranberries

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

Observation Chart Two:

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

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? _____

3. Make Copies of Cranberry Observation Chart 2 (1 per group)

4. Set up a Cranberry Questions Chart, on chart paper or in a location that can be kept posted for the duration of your cranberry studies. Label this sheet, **Cranberry Questions**; you will begin to collect questions during this lesson, and return to them throughout the curriculum.

5. Wash a cup or so of cranberries (enough so that each student may taste 1-2) for tasting. Set them aside. Plan to use the remainder for the rest of the sensory explorations.

6. If you do not have access to fresh, whole cranberries, it is important to substitute the videos for the personal experience with the cranberries.

However, this alone is nowhere near as powerful as experiencing the whole cranberries on their own, or in conjunction with the videos.

7. Prepare two medium sized samples (4 oz. or so) of cranberry products for each group (of 3-4 students). Each group should get its own combination of sample products, but there should be several different products distributed across the class. **For example**:
   Group 1: Cranberry relish, cranberry juice (red)
   Group 2: Cranberry relish, cranberry juice (white)
   Group 3: Cranberry chutney, cranberry juice (red)
   Group 4: Cranberry chutney, cranberry juice (white)
   Group 5: Canned cranberry sauce (whole cranberries), dried, sweetened cranberries
   Group 6: Canned cranberry sauce (whole cranberries), canned cranberry sauce (jellied) (Note: When your students smell the canned cranberry sauce, they may report a tinny odor. You might wish to have them also smell juice from another group's sample so that they can distinguish between the cranberry fragrance and that of the container.)

   Group 7: Dried, sweetened cranberries, canned cranberry sauce (jellied)

Lesson

1. Begin the lesson with an invitation to 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, so long as they keep 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 or on video, as appropriate to each group, and sampling cups and serving

ware so that each student can taste the item (as appropriate). 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 their 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 bogs, and that soon they will be exploring the cranberry bog.

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.