

Cranberry Lesson

Goals

Students will...

- Increase their familiarity with cranberries.
- Eat cranberries when offered them.
- Increase their awareness of the environmental benefits of composting.



Objectives

Students will...

- a. Explain how cranberries are grown from planting through harvesting.
- b. Describe the environmental needs of cranberries (climate, soil, etc.).
- c. Describe how cranberries grow without human intervention
- d. Find the origin of cranberries on a map
- e. Explain where cranberries are grown and harvested in Maine
- f. Write a letter using the appropriate format or a narrative with appropriate punctuation and capitalization.
- g. Enter information into a table and construct a bar graph.

Lesson Activities

- Review points about safety, sanitation, and cooperation
- Introduce cranberries
- Background information on cranberries
- Lessons from the Farm
- Cook cranberry-pear crisp
(Form groups of 4 to 6 students)
- Do compost activity while food is cooking
(See compost lesson for mini-lessons)
- Eat
- Wrap-up
- Distribute copies of recipes and challenge sheets to students
- Clean-up

Other Cranberry Activities

Nutrition science lesson
Writing ideas
Cranberry challenge sheet
Fact sheet

Student activity sheet
Word search
Additional recipe
Global and regional mapping

Background Information on Cranberries

Did you know that...?

Cranberries grow from vines and not seeds

Before planting a new cranberry, the land is leveled. Dikes are constructed around the edges of individual beds to allow for flooding. Drainage ditches and canals are constructed to allow for efficient water management. In older plantings (some are over 100 years old and still in production), the beds follow the contours of the land. The beds range in size from less than one-half acre to nine acres. Many growers view a bed of one to two acres as an ideal size due to various aspects of water management.

Cranberries are established from stem cuttings called vines. In the spring, established cranberry vines are mowed and the vines are collected into bales to be moved to the new cranberry bog. Mowed beds do not produce cranberries that season, but the plants are stimulated to produce new, vigorous vines that produce fruit the following year.

In the new bed, the cuttings are spread on the ground and worked into the soil. By the end of the summer, the vines have produced roots and are considered established. Three to five years after planting, a cranberry bed begins to produce enough cranberries to sell.

Water management is necessary to grow and harvest cranberries. In the winter, water is used to flood the bogs. The ice that forms encases the vines and protects the buds from cold. A two-inch layer of sand is then spread over the ice for more protection. In the spring, the sand filters down through the vines as the snow melts, which helps the vines grow and destroys insect eggs that are found on the bog floor.

Even though cranberry farmers grow cranberries from vine cuttings, in nature, cranberries grow from seeds. Each berry contains tiny seeds. If the berry is not harvested it will eventually dry up, fall to the ground and when conditions are right, it will begin to grow into a vine. Eventually the vine will blossom, the blossoms will be pollinated and a berry will grow to start the process again.

Farmers have to flood their bogs in order to harvest most of the cranberries

Harvesting can be done in two ways. For the fresh market, cranberries are dry harvested with a mechanical scooping machine that removes the berries from the vine. For products such as juice and sauce, cranberries are wet harvested. The beds are flooded and the vines are mechanically beaten, releasing the berries. The

berries float to the top of the water and are either pushed by a wind machine or dragged to one end of the bog. Then they are pumped through a pipe and into metal transport boxes.

Cranberries are one of three commercially grown fruits native to North America (The other two are blueberries and Concord grapes.)

Native Americans found many uses for cranberries

Native Americans used cranberries long before colonists arrived. They were used for food, dyes and medicines. Massachusetts Indians cooked cranberries with honey or maple syrup to sweeten them. They also pounded the berries with deer meat, forming a sun-dried food called *pemmican*. Cranberries were also used for making a hot bandage called a poultice. Poultices were placed on arrow wounds to prevent blood poisoning.

Today, cranberries are most often associated with juice and cranberry sauces. An interesting fact is that a University of Maine graduate by the name of Marcus L. Urann created the first recipe for cranberry sauce in 1912.

The cranberry got its name from the way it looked. The plant has oblong leaves and pink or white flowers. The blossoms reminded the Pilgrims of the heads of cranes so they named the plant “craneberry” which was later shortened to cranberry.

Cranberry bogs are being developed in Maine

Maine’s 2006 cranberry harvest totaled more than 11,000 barrels. (A barrel equals 100 pounds). There are now over 200 acres of cranberries in production in Maine. Approximately 180 of those acres are located in Washington County (Have students locate on Maine map.). There are about 40 cranberry growers in Maine with established beds and even more potential growers are making plans to join the industry.

Cherryfield Foods has begun a \$36 million plan to have 900 acres planted over the course of the next 10 years. (This compares with Massachusetts, the leading producer of cranberries, with an average annual crop of approximately 1.9 million barrels in 1992. Massachusetts provides 42% of the world’s cranberries.)

* For information on field trips to a cranberry bog, contact Clyde MacDonald at 1-800-566-4664.

Lessons from the Farm – Cranberries



Cranberry farmers have different jobs to do for each season of the year to grow healthy cranberries. They grow their cranberries on a piece of land called a bog. A bog is ground that is wet and soft. In the winter, starting in December, they flood all of the cranberry bogs to make ice that will help protect the cranberry vines through the Maine winter. The ice acts as a protective coat for the plants.

The ice melts in the spring and the cranberry vines slowly start to grow again. Spring is the time that cranberry vines do most of their growing. In the summer, the cranberry farmers make sure there are bees near the cranberry plants. In June, they bring in two beehives for every small bog. The bees travel from one cranberry flower to another, carrying pollen, which helps grow new cranberry vines. The summer is a good time to see all the pink flowers that grow on the vines.

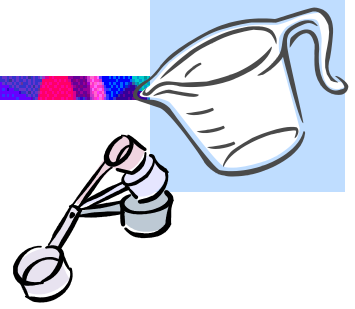
The fall is a very busy time for cranberry farmers. They pick cranberries in the fall. People are able to make things like cranberry sauce and cranberry juice, and use the berries in cooking.

The cranberry farmers pick cranberries by flooding the bogs with water. They loosen the berries from their vines with a special machine and the berries float to the top of the water! It is like a big red pond of cranberries when you see them floating on the water. They are able to push them into another machine and from there they go to storage boxes. The cranberries are taken to many different places and hopefully, they eventually get to a grocery store near you.

Materials and Preparation

Food needed for cranberry-pear crisp recipe (for 4 groups)*

2 cups quick cooking oats
1 cup whole-wheat flour
1 1/2 cups dark brown sugar
2 tsp. cinnamon
2 sticks butter (kept frozen)
4 (1 lb 13 oz) cans pears in light syrup
1 cup dried cranberries
1 tsp. ground cardamom
2 cans cranberry sauce - 1 whole, 1 jellied (nutrition science lesson)
9 small jars of juice: 3 cranberry, 3 cran-mango, 3 cran-raspberry (nutrition science lesson)
1 bag raw cranberries (nutrition lesson)
Drinks for students



Materials needed (for 4 groups)

Dixie cups	Star stickers
Colored pencils or markers	Compost bucket
Poster paper for bar graph 2 1/2" by 4" (1 per student)	Aluminum cooking tins approximately
4 liquid measuring cups	4 sets of dry measuring cups
4 knives	4 sets of measuring spoons
4 pastry blenders	4 can openers
4 large bowls	4 medium bowls
8 large cookie sheets	Serving spoons (one for each student)
Wax paper	8 potholders
Copy of recipes for each student	Cleaning towels, napkins
Copy of writing sheet for each student	Copy of word search for each student
(Copy of <u>Parts of the Cranberry</u> handout for each student)	(Copy of Maze for each student)
	Copy of challenge sheet for each student

Materials and Preparation continued



Each station should have the following:

Food

1/2 cup oats
3 Tbs. whole-wheat flour
1/4 cup dark brown sugar
1/2 tsp. cinnamon
3 Tbs. chilled butter
3 cups pears
Pear juice
1/4 cup dried cranberries
1/8 tsp. cardamom

Materials

1 aluminum tin per student
1 set dry measuring cups
1 liquid measuring cup
1 set measuring spoons
1 knife
1 pastry blender
1 medium bowl
1 large bowl
1 spoon per student
1 large cookie sheet
2 potholders
1 cutting board
1 can opener
1 marker
Copy of recipes

Use Maine cranberries and other Maine products if available.

Classroom Recipe for Cranberry Pear Crisp

Ingredients:

- 1 cup quick-cooking oats
- 1/3 cup whole-wheat flour
- 1/2 cup packed dark brown sugar
- 1 tsp. ground cinnamon
- 6 Tbs. chilled stick butter, cut into small pieces
- 6 cups canned pears (1 inch pieces), or 2 1/2 lbs. Bartlett pears
- 1/2 cup dried cranberries
- 1/4 tsp. ground cardamom



Use Maine ingredients whenever possible.

Student Cooking Activities

Note: This recipe requires the use of knives and ovens.

Preheat oven to 375°F.

Measure and combine oats, flour, 1/4 cup brown sugar and cinnamon.

Cut in butter with pastry blender until mixture resembles coarse meal. Set aside.

Measure and mix 3 cups pears and 1/4 cup pear juice with cranberries in large bowl.

Add 1/4 cup brown sugar and cardamom to cranberry mixture.

Place 1/2 cup cranberry mixture into aluminum tins.

Sprinkle with oat mixture.

Place tins on cookie sheet and bake at 375°F for 20 minutes or until pears are soft.

Yield: 10 servings (1/2 cup per serving)

Nutrition Science Lesson - Cranberries



Same Food, Different Form

Explore with the students how foods can be changed into different forms. On a blackboard or poster, students can list examples of foods that change form, or you can do activities from the following list. Have students identify natural changes and man-made changes.

Grapes	Raisins
Cucumbers	Pickles
Apples	Apple Juice
Cream	Butter
Dry Jello	Ready-to-eat Jello
Pudding mix	Pudding
Cranberries	Cranberry Sauce

Cranberry Sauce Recipe:

- Rinse 1 pound (4 cups) fresh or frozen cranberries in strainer with cool water.
- Remove any stems or blemished berries.
- Heat 2 cups water and 2 cups sugar to boiling in saucepan over medium heat, stirring occasionally. Boil 5 minutes, continuing to stir.
- Add cranberries. Heat to boiling over medium heat, stirring occasionally. Boil another 5 minutes until cranberries begin to pop.
- Remove saucepan from heat and pour contents into bowl or container.
- Refrigerate 3 hours or until chilled. Makes 16 servings.

Use Maine cranberries if possible.

Nutrition Science Lesson continued



- Discuss with students why people would want to change the form of foods. (Ex. Variety, longer storage life, or to make foods taste better)
- Ask for examples from the students. (Ex. Adding sugar to cranberries when making sauce makes it taste better because cranberries are very tart.)
- Display different forms of cranberries: raw, dried, juices, whole cranberry sauce, and jellied cranberry sauce.
- Perform a taste test with the students using different blends of cranberry juice.

Taste test directions

- Using cran-apple, cranberry and cran-mango juices, pour samples of each into numbered Dixie cups.
- Provide 3 Dixie cups containing the 3 juices for each student.
- Provide red, blue and silver stickers to each group.
- Have the students rate the juices:
 - Silver star for best liked
 - Blue star for second best
 - Red star for third choice.
- Put the stickers on a bar graph, reveal the juice blends, and name the favorite!

Cranberry Student Activity Sheet

Name _____



1. Predict which juice the class will like the best.

2. Why have you predicted this juice?

3. In the table below, record your taste test: write the name of the juice in the column “Juice” and a number in the column “Number.” Write the color: silver for best liked, blue for second-best, and red for least liked.

Juice Cup Number	Color

4. Class will make a bar graph to show how well the class liked the juices.

5. Did your prediction match the results?

Global and Regional Mapping

Cranberries



World Map

Discuss with students the origin of cranberries. Have them find it on the map.

Cranberries ----- North America (90°, 45°)

Local Harvest Calendar

Discuss the 5 primary states cranberries are grown in: Massachusetts, Wisconsin, New Jersey, Oregon and Washington.

Cranberries are also grown in parts of Canada, and more and more are being grown here in Maine.

Have students determine when cranberries are available in our area from the harvest calendar (they are harvested in September and October).

Discuss methods of storing cranberries through the winter months (drying, freezing, or making them into a sauce or juice).

Date _____ Name _____

Cranberry Fact Sheet

1. What part of a plant is the cranberry?



2. Where did cranberries originally come from?

3. In what season do cranberries grow best?

4. Where are cranberries grown in Maine?

Writing Ideas - Cranberries



1. What did you like or dislike about this lesson?
2. Write a letter to a cranberry farmer.
3. Cook the cranberry recipe for your family or friends. What did they think? Did they like it? Were they surprised?
4. Come up with your own ideas.

Cranberry Challenge Sheet



I agree to try cranberries the next time they are served to me in the cafeteria or at home.

I agree to eat cranberries	I did it! I ate cranberries!

Cranberry Word Search

N I S A W F E A S T M N A Q
E S T S A S R E K C I P S R
W A T M S A B O G R D T M L
J U E G H I R R E D N L I A
E C S Y I T S J W P E I R T
R E U R N B A L I U S T G C
S A H R G E N P S S W M L C
E J C E T R D O C W E F I C
Y U A B O R E G O N T R P G
J I S N N I P P N C L U V A
J C S A S E Y A S A A I I H
A E A R L S B Y I A N T N F
M R M C W O A D N E D L E U
C S W E E P N E T O S T S Y

Find the words hidden above that are about cranberries.

RED

BOG

OREGON

NEW JERSEY

WETLANDS

MASSACHUSETTS

SWEEPNET

SAUCE

JUICE

FRUIT

WASHINGTON

BERRIES

VINES

CRANBERRY

WISCONSIN

PICKERS

FEAST

JAM

PILGRIMS

SAND

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(Answer Key on page 231)