

**FUN FACES OF WISCONSIN AGRICULTURE
BOUNCING CRANBERRIES!**



Activity Length:

Estimation – 15 minutes

Mistakes that became a discovery – 30 minutes

Bounce Testing – 20 minutes each day – (must be done 3 different days)

To Your Health – 30 minutes

Berry Math Lesson – 30 minutes

Student Objectives:

1. Students will utilize estimation skills in estimating the number of berries in a jar and seeds in a berry.
2. Students will use reading skills to discover an important test in the Cranberry industry.
3. Students will recreate what they read about to conduct their own experiment and record data.

Wisconsin Model Academic Standards:

English	A.4.1	A.4.2	A.4.3	A.4.4	C.4.2	E.4.1	E.4.2		
Math	A.4.1	A.4.2	A.4.3	A.4.4	A.4.5	B.4.1	B.4.2	B.4.3	B.4.5
Science	A.4.1	A.4.5	C.4.2	C.4.4	C.4.6				
Social Studies	A.4.2	A.4.4	A.4.5	B.4.1	B.4.2	B.4.3	D.4.3		

Introduction: Cranberry Fast Facts

Important Terms:

- Antioxidants – Compounds that neutralize free radicals when they are formed
- Anti-adhesion – Helps prevent bacteria from forming
- Carbohydrates – Carbohydrates are part of a healthful diet. Sugars and starches supply energy to the body in the form of glucose, which is the only energy source for red blood cells and is the preferred energy source for the brain, central nervous system, placenta, and fetus.
- Calorie – The amount of heat needed to raise the temperature of a liter of water 1 degree.
- Dietary Fiber – Dietary fiber is composed of non-digestible carbohydrates and lignin intrinsic and intact in plants. Diets rich in dietary fiber have been shown to have a number of beneficial effects, including decreased risk of coronary heart disease.

Materials for this activity:

- Cranberries- fresh if possible
- Cranberry products from grocery store: various cranberry juices, Craisins®, Craisin Trail Mix®, cranberry sauces (whole berry and jellied), cookies and other products.

Activity Outline:

Estimation

Students will gain a brief introduction to cranberries by determining how many are in the jar.

1. Before class, fill a jar with cranberries and allow students the opportunity to make guesses as to how many are in it.
2. Pass around a single berry and encourage students to take guesses as to how many seeds are inside the berry.
3. As a class, discuss methods for determining the answers to how many berries are in the jar and the number of seeds without actually counting each one. How accurate will each method be? What is the best idea?
4. Use one or more suggestions and determine the number of berries and seeds and compare students' answers.

Mistakes that became a discovery

Students will learn about the history of the "bounce test" to determine cranberry freshness.

1. The origin of the bounce test: A New Jersey grower, John "Peg Leg" Webb discovered the cranberry bounce test. Instead of carrying his crop of cranberries down the steps of his barn, he poured them down the steps. Only the firmest and freshest fruit reached the bottom of the steps. The berries that were bruised or rotten remained on the steps. This concept was used to develop the bounce board separators which are used today. Was it an accident that John Webb dumped his load of cranberries down the steps or did he have a theory that it would work?
2. As a class, discuss how new technologies are developed for the food industry? How were pieces of equipment developed for various harvesting, planting and processing? Can students think of equipment they use and how it might have been developed?

Bounce Testing

This activity will give students the opportunity to reconstruct the test they just read about while gathering and recording data. Begin the activity on a Monday so that trials can be run on Monday, Wednesday and Friday.

1. As a class, brainstorm ways to recreate this test in the classroom or the school (steps are ideal). If steps are not available, create an alternative launching area so that the berries drop by 1 foot.
2. Divide students into groups. Each group will have 20 cranberries. Push the cranberries off and put them into separate containers – one for those that bounce and one for those that don't bounce.
3. Collect initial data of sample weight and record it in a table. How many bounced and what did their appearance look like? How many didn't bounce and what was their appearance like?
4. Run the trials every two days and record the data. Discuss why any changes may have occurred from one trial to the next.

5. Calculate the percent of good berries in the sample.
6. Did the number of berries that bounced increase or decrease during the later trials? Why? How were the berries stored? Did this have an influence on their quality?
7. Organize information and create a classroom display to present it.

To Your Health

This activity will help students understand how to determine the health benefits of cranberries and the different products cranberries are made into.

1. Cranberries and cranberry products offer many important health benefits. Native Americans used cranberries to relieve a variety of health problems. Today's cranberries are not only a healthy, low-calorie fruit, they may also help prevent urinary tract infections and reduce the risk of gum disease, ulcers, heart disease and cancer.
2. Antioxidants are compounds that neutralize free radicals when they are formed. The human body is capable of producing antioxidants naturally, but under conditions of stress this antioxidant production can be severely impaired. Fruits and vegetables, including cranberries, provide an excellent source of additional antioxidants.
3. Cranberries have anti-adhesion properties that helps prevent bacteria from forming in the mouth. This helps reduce the build-up of plaque that can lead to gum disease.
4. Obtain various cranberry products from a grocery store. Products could include: various cranberry juices, Craisins®, Craisin Trail Mix®, cranberry sauces (whole berry and jellied), cookies and other products. Have the students look at the nutritional labels and refer to (www.teamnutrition.usda.gov). Go to Resource Library, Educators and then to Read it before you eat it poster for assistance in reading the food nutritional labels.
5. Develop a weekly school lunch (if you bring your lunch) and snack menu that includes cranberries at least once per day.

Berry Math Lesson

1. Distribute Berry Math Worksheet for a classroom activity or homework assignment

Suggested Reading Materials:

- *Cranberries: Positively Wisconsin*. Interactive curriculum and video from Wisconsin State Cranberry Growers Association (www.wiscran.org)
- *Cranberries: Fruit of the Bogs*. By Diane L. Burns

Additional Worksheets:

- Careers Guide related to cranberries
- Ag Statistics Lesson Plan related to cranberries
- *Wisconsin Cranberries Activity Book* - Cranberry Crossword (page 5) – Available from (www.wiscran.org)

Related activities:

- Research other scientific discoveries that were discovered “by mistake” and discuss the impact they have had.
- Visit the Wisconsin Cranberry Discovery Center website (www.discovercranberries.com) and click on Recipes. Have the class find five recipes that they like and that can be made in the classroom. Recipes that need to be prepared at home should be assigned to volunteers.
- Visit (www.oceanspray.com) Click on News, Special Events, Ocean Spray Kids for classroom activities and recipes
- Make a Popcorn and Cranberry Ornament. Download worksheet from (www.wisagclassroom.org) Hands-on activities
- Research other inventions, technology or equipment that has been developed for agriculture. Visit *Growing a Nation – The Story of American Agriculture* (www.agclassroom.org/gan) for more historical information.