Alaska 'Bonsai' Potato

By Sandra DeTerra

Objectives

• Use agriculture in the math classroom to increase students' vocabulary of the parts, history and uses of the Alaska Russet Potato.

• Find the approximate volume of the potato, using volume formulas for solids and objects of irregular shapes.

• Use math tools to measure growth of vines and graphs to compare growth.

• Use art and science in the math classroom to design a "bonsai potato."

• Use the Internet to research agricultural resources in Alaska.

Suggested grade levels

Algebra I students

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Project

Collecting data from growing an Alaska "Bonsai Potato"

Procedures

Each student will identify the parts of a potato by researching the Russet Potato, which is grown in the Matanuska-Susitna Valleys and near Nanana in Alaska. We will use eWorksheets—one per class meeting — to learn the vocabulary and the volume formulas for geometric solids, the parts of the potato, estimate the volume of the potato each has before putting it in water, and the nutrient value of this important Alaska natural resource.
Approximately 3-4 weeks before the class starts the project, each student will place the potato in a plastic bowl of water and arrange the bowls under "grow lights" or near a window lighted by the sun. The student must check the dish each day to maintain the correct amount of water in the dish. Once the potato starts growing in water, the student will measure growth of the different vines that appear and record the data in a line graph with lines of different colors. The horizontal scale will be the days of the weeks, and the vertical scale will be the length of the vine in millimeters.

After 2-3 weeks, students will trim the vines to design their own "Bonsai Potato," an art project, as well as a study of science, while doing math. The students will do a comparison bar graph to see who gets the Bonsai Potato to live the longest in a 9-week-term period. There will be a contests judged by students and teachers from an art class to motivate the students to make beautiful creations. The project will end by cooking some new potatoes using a recipe the class agrees upon, and sharing the taste of the finished product. There will be an assessment written test to see if the class met the project objectives.

Materials & Preparation

Purchase 50 Alaska Russet Potatoes per 25 students, 25 disposable plastic bowls, and a grow light if no sunlit window is available.
Need 12 pairs of Fiskar scissors per 25 students and 12 metric rulers.
Need 12 boxes of sharpened colored pencils.
Photocopy 3 graph sheets (see attachment, "AKbonsai-grid.doc or AKbonsai-grid.pdf) per student.
Prepare "eWorksheets" with website addresses and questions to answer from research on web about the potato; photocopy 30 copies of each worksheet for 25 students, in case extras are needed.
Reserve the math computer lab for 6 class meetings to do research.
Arrange for students and teachers to judge contest and for use of school kitchen.
Prepare a test to evaluate whether objectives were met.

Materials
See body of lesson

Alaska Content Standards
See body of lesson

Terms to Define
Russet potato
Eye
Eyebrow
Stem
Basal end
Lenticle
Variety
True seed
Leaves
Root system
Stems
Stolons
Flower of potato
Bonsai
Volume
Solids
Line graphs
Bar graphs
Website
Internet
Recipe

Alaska Agriculture in the Classroom is a project of the Alaska Farm Bureau. For more information, visit www.agclassroom.org/ak

Lesson author Sandra DeTerra is a teacher in the Anchorage School District.

Instructional Resources
• THE ART OF THE BONSAI POTATO—THIS KIT CONTAINS EVERYTHING YOU NEED EXCEPT THE POTATO by J. E. Fitzsimmons, Running Press, Philadelphia, PA, copyright 2004.
• A SLICE OF ORGANIC LIFE edited by S. Goldsmith, foreword by A. Walters, DK Publishing, New York, NY, copyright 2007
• Student required text ALGEBRA I—AN INTEGRATED APPROACH, by Littell, by J. Benson et. al., McDougal Littell/Houghton Mifflin, Evanston, Illinois, copyright 1995

Websites
www.uaf.edu/ces
http://davesgarden.com/pf/go/50061/index.html
www.rainforestwebs.com/recipes/potfoc.html
http://AlaskaRecipes.com
www.uwm.edu/People/mroffers/Biology.htm
www.fb.org/farmfacts
http://math.about.com
http://math2.org
www.graphcharts.com
http://collections.ic.gc.ca/potato/
www.dk.com

Motivation/Guided Exploration
Fun activity/hands-on/group activities
Use science and art with math
Comparisons
Contest
Cooking Reward
Successful test grade

Assessment: Did students meet the objectives of the project?

Art Standards
Follow basic steps of Bonsai and basic art design.
Reading Standard
Increase vocabulary and reading comprehension in math.
Math Standard
Use correct geometric formulas for volume.
Use tools for measurement.
Use line graphs and comparison bar graphs.
Science Standard
Use correct parts of a plant—the potato.