Taste Test Instructions

Taste testing in the classroom gives California students access to and new-found knowledge about fruits and vegetables that will help them make improved food choices. Below are instructions on how to conduct a taste test in your classroom.

Purchase California Specialty Crops

Here are four ways to conduct a taste test and purchase commodities for sampling. All are acceptable for your grant.

1. Purchase one commodity for your class to sample.
   Example: Have the class sample artichokes.

2. Purchase a few different varieties of a commodity for your class to sample.
   Example: Purchase three different types of apples.

3. Purchase one commodity and prepare it differently—fresh, cooked, dried, etc.—for your class to sample.

4. Purchase one commodity in different forms—fresh, canned, and frozen—for your class to sample.

Prepare the Taste Test

1. Before preparing the taste test samples, be sure to wash your hands, utensils, and fresh produce.

2. Prepare a sample for each student.

3. Have each wash their hands prior to tasting.

Discuss Taste Test Results

1. Discuss the nutritional value, appearance, taste, texture, and smell of the commodity.

2. Have the class explain what they liked about the commodity, which variety they liked best, or how they liked the commodity prepared.

3. Have students complete the Student Journal (download template from www.LearnAboutAg.org/tastetest/studentjournal).
Student Journal

Name: _____________________________________ Date: _______________________________

Today I tasted:_______________________________ Teacher Name: _______________________

I like this fruit or vegetable...
(Circle your Choice)

A Lot! Somewhat Not Very Much

Describe the texture, smell, and taste of this fruit or vegetable:

__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________

This is what I learned about California Specialty Crops today:

__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________

Word Bank:

Astringent  Colorful  Flavorful  Lingering  Overripe  Ripe  Sour
Bitter  Creamy  Fragrant  Luscious  Plump  Rough  Spicy
Bland  Crisp  Fresh  Messy  Pungent  Savory  Sweet
Chalky  Crunchy  Fuzzy  Moist  Rancid  Slimy  Tangy
Chewy  Delicious  Gritty  Mouthwatering  Refreshing  Smooth  Tart
Clean  Firm  Juicy  Odorless  Rich  Soft  Vibrant

Form also available online: LearnAboutAg.org/tastetest
Cling Peaches

Commodity Value
Cling peaches have a value of $120 million at harvest and increase to more than $450 million after processing. Cling peaches are primarily processed into two major products: canned cling peaches which are diced, sliced or halved, or diced as an ingredient in fruit cocktail. Other products include frozen cling peaches, baby food, and peach concentrates.

Top Producing Counties
Cling peaches are grown on approximately 20,000 acres in the San Joaquin and Sacramento Valleys by more than 450 growers. Five companies are responsible for processing the harvest, around 325,000 tons per year.

Although peaches are grown in 41 states, California accounts for nearly 100 percent of the commercial production of cling peaches in the United States. Butte, Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, Sutter, Tulare, and Yuba counties produce most of the state’s cling peaches. These areas are "chilling hours" to set the following year’s crop. Later in the season, warm summer days combined with rich soil, and adequate water provide strong fruit growth.

History
Chinese writings more than 3,000 years old give reference to peaches. In California, Spanish padres found that cling peaches thrived along the mission trail. In the late 1700s, President George Washington enjoyed the peaches he grew in his garden at Mount Vernon. The fruit became well established during California’s gold rush when settlers began growing and preserving them for commercial sale to miners. During World War I peach pits were gathered, ground, and used as filters in gas masks.

Varieties
The 16 most common California peach varieties, which account for 92 percent of all acreage, and are separated into four main groups identified by harvest time—from extra early (late June) to extra late (September). The term “cling peaches” was given to these varieties because the flesh of the fruit “clings” to the pit. Today, by-products from peach processing are used in animal feed and compost.

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How Produced
Cling peach trees are grown by nurseries and sold to growers for planting during dormancy in the winter months. To encourage early fruit production, trees are planted with a minimum density of 121 trees per acre. The first peaches are seen when the trees are one year old, in “second leaf.” At five years, they are in full production, yielding an average of 18 tons of fruit per acre. The orchards require the constant attention and care of the growers. Pruning is generally done during the winter months. Thinning is done in the spring to achieve optimum sized fruit at harvest.

Harvest begins at the end of June in the southern San Joaquin Valley, and concludes soon after Labor Day in the northern Sacramento Valley. Cling peaches are picked when fully ripe. An average picker harvests three tons of peaches each day. Quality peaches at optimum maturity are placed in bins that hold 1,000 pounds of fruit. The fruit is then delivered to canneries that operate seven days a week during peak season.

At the processing plant, peaches are unloaded on a conveyor belt where they are sized and sent into the appropriate pitting machine. Following pitting, cling peaches are peeled and sliced. All peaches are packed in natural syrup to preserve quality and taste. Finally, the cans are sealed, cooked, and cooled. The fresh fruit is generally processed into one of its many products within 24 hours. Quick processing allows the fruit to maintain its nutritional value and quality.

Nutritional Value
California cling peaches are picked at the optimum nutrient level and the canning process locks in nutrients until you open the can and take a bite. Cling peaches are naturally fat-free and contain high levels of vitamin A and vitamin C. They also contain carotene and lycopene, antioxidants that improve skin condition and strengthen eyesight. In 2008, scientists discovered that carotene and lycopene increase during the canning process, supporting the claim that cling peaches are a great source of these nutrients.

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Lesson Ideas

- Research the characteristics of cling and freestone peaches. Hypothesize the benefits of each and why both are important to the agriculture industry.
- Analyze the nutritional labels on various canned cling peach products. Which cling peach product would you choose for its nutritional benefits? Defend your choice.
- Research how cling peach growers/farmers increase their production and lower labor costs.
- Using the figures on the fact sheet, calculate the average number of cling peach trees in California.
- On a map of California, identify the major counties where cling peaches are grown. What geographic characteristics do these counties have in common and how do these help with cling peach production?
- Create a recipe that includes cling peaches. Have the students practice their arithmetic by halving, doubling and tripling their recipes.
- Develop a flow chart showing the innovative and technical processes used to get peaches to homes throughout the county.

Fantastic Facts

1. How many years does it take for a cling peach tree to be in full production?
2. Who were the first people to commercially farm cling peaches in California?
3. How many tons per day does an average cling peach picker pick? How many pounds?
4. Are most cling peaches sold frozen, fresh or canned?
5. How many times per year are cling peach trees pruned?
6. Name one vitamin cling peaches contain.
7. What percentage of United States’ commercial production of cling peaches does California produce?
8. Name one way cling peaches are processed.
9. Why did people collect peach pits during World War I?
10. Who was the first president that grew peaches?

   1) Five  2) The gold miners  3) Four tons; 8,000 pounds  4) Canned
   5) Twice  6) Vitamin A, vitamin C  7) Nearly 100 percent  8) Canned
   9) Used as filters in gas masks  10) George Washington

Lesson Plan: Cling Peaches – A Convenient Fruit

Introduction: Cling peaches are processed in a variety of ways to provide nutritious, convenient fruit to people throughout the world. In this activity, students will analyze cling peach packaging techniques and the value added to the peaches in processing.

Materials: A variety of cling peach products including canned peaches in different mediums and cuts, baby food products, flip-top individual servings, juice concentrates and frozen cling peaches with the cost of each item, paper, markers and pencils.

Procedure:
1. Ask the students why people may eat processed fruit products such as cling peaches rather than fresh fruit. Write the variety of answers on the board. Answers may include taste, convenience, food safety, nutrition and year-round availability.
2. Have the students create a list of processed cling peach products and, in labeled columns, record the price and weight of each item.
3. Divide the students into small groups. In additional columns on their papers, have students determine the price per ounce of the food products and then rank the food items from most expensive to least expensive.
4. Students discuss and then write ideas why some of these products were more expensive than others. Possible answers may include processing requirements, packaging costs and the popularity of the product. As a class, discuss each group’s comments and the term “value added.”
5. Have the students taste the cling peach products. Create a class graph that depicts the levels of their popularity.
How Produced – A tree starts to bear fruit four to six years after planting and reaches its full production capacity (150 to 300 pounds of raw fruit per year) sometime between its eighth and twelfth year in the ground. The tree will continue to bear quality fruit on a commercial basis for about 30 years.

By mid-August, the orchards are ready for harvesting, which generally takes about 30 days. Harvest time is determined by fruit ripeness, since plums are one of the few fruits allowed to fully tree ripen before they are picked.

Today, the majority of California’s dried plums are machine harvested. The fruit is shaken off the tree and transferred via conveyor belt into bins which then go to the dehydrator. The orchard ripe fruit is washed, placed on wooden trays, and dehydrated—three pounds of fresh fruit then become one pound of dried plums.

From the dehydrator, the dried plums go to packing plants where they are graded for size, inspected, and stored to await final processing and packaging. Unlike the majority of processed fruits, most dried plums are packed to order. With each order, plums are re-hydrated, sterilized, put through a final inspection and packaged for shipping.

History – Louis Pellier, a Frenchman, introduced dried plums to the United States in 1856 after an unsuccessful gold mining venture in California. He established an orchard in Santa Clara Valley which became a great success. As the seasons turned, Pellier’s patient work began to bear fruit, and the California dried plum industry was born. The development of the transcontinental railroad in 1869 increased the market for dried plums across the nation.

In 1905, California dried plum grower Martin Seely tried to remedy a labor shortage by bringing 500 monkeys to the Santa Clara Valley from Panama to pick dried plums. Seely organized them into crews of 50 (with a human supervisor overseeing each crew) and set them to work in the fields. While the monkeys were reliable at picking the fruit, they also ate every plum they picked.

In 1941, America’s involvement in World War II provoked the heaviest buying of dried fruit in history. However, the war years were challenging for farmers—farm labor shortages, limited inventories of supplies and farm equipment, and rising costs all took their toll.

Varieties – Not all plum varieties can be dried. The high sugar content of the California variety allows it to be dried without fermentation occurring around the pit. The California variety is an offshoot of La Petite d’Agen, a plum native of Southwest France. Today’s California dried plum accounts for 99 percent of the United States dried plum production because it has ideal characteristics for drying.

Commodity Value – California supplies more than 47 percent of the world’s supply of dried plums from more than 49,000 bearing acres. Approximately 69,000 tons of dried plums are exported annually to more than 75 different countries. In 2012, California produced 137,000 tons of dried plums, valued at $179 million.

Top Producing Counties – Most dried plums are grown in the Sacramento and San Joaquin valleys where the rich soil and the long, warm and clear growing season provides ideal growing conditions. The leading counties are Sutter, Butte, Yuba, Tehama, Glenn, and Tulare.

Nutritional Value – California dried plums are a high-energy snack that provides antioxidants, potassium, and fiber. These nutrients may help reduce the risk of some chronic diseases. Dried plums have a unique combination of high levels of pectin, sorbitol, and malic acid which makes dried plum puree an ideal fat substitute in baking. The antioxidants in dried plums eliminate the “warmed-over” flavor in precooked meats, and fiber and sorbitol help retain moisture in leaner cuts of red meat and poultry.

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Lesson Ideas

- Keep a daily journal tracking the food you eat throughout the week. Compare your daily servings of fruits and vegetables to those recommended by USDA's MyPyramid. Set an attainable goal to increase your fruit and vegetable consumption.
- Use MyPyramid to investigate the nutritional value of fresh vs. dried fruits. Determine if there is enough fruit in your daily diet.
- Create short myths explaining how dried plums get their wrinkles.
- Devise an advertisement which promotes the eating of dried plums.
- Create an advertising jingle promoting dried plums.
- Find out how dried plums are associated with the Gold Rush of the 1800s.
- Research the science of dehydration and learn its benefits as a food preservation method.
- Invite a dried plum producer or grower into your classroom to discuss his or her profession.

Fantastic Facts

1. How are dried plums harvested?
2. In what California valley was the first dried plum orchard established?
3. What animal did a dried plum grower try to use as a picker in his orchards during a labor shortage in 1905?
4. True or false? Dried plums are fully ripened on the trees before harvest.
5. What characteristic allows d'Agen plums to dry without fermenting around the pit?
6. How many pounds of fresh fruit make one pound of dried plums?
7. True or false? Water is added to dehydrated dried plums right before they are packed for consumers.
8. For about how many years are commercial plum trees productive?

Lesson Plan: A Low-Fat Cookbook

Introduction: Over the last decade, people have realized the health benefits of having a low fat diet that includes a minimum of five servings of fruits and vegetables each day. In this activity, the students will analyze some of their favorite recipes and see how they can make their favorite dessert a healthier snack.

Materials: 1½ cups (8 ounces) pitted dried plums, water, blender, one packaged brownie mix with required ingredients, one favorite baked snack recipe from each student, blank paper, markers, construction paper.

Procedure:
1. Make a puree by pureeing 1½ cups of pitted dried plums and six tablespoons of hot water in a food processor or blender. This makes one cup of dried plum puree. Use one half the butter or oil called for in the recipe. Replace the amount of butter eliminated with one-half measure of dried plum puree. If a recipe calls for 1 cup butter, use ½ cup butter and ½ cup dried plum puree.
2. Have the students taste the brownies and comment on their flavor. Explain what you did to make them lower in fat.
3. Have the students bring in one or two of their favorite brownie, cake or cookie recipes and rewrite the recipe using dried plum puree (see step 1). Encourage the students to try their new recipes at home. Works best with dark colored baked goods.
4. Create a class cookbook of the low-fat recipes. It may include a recipe from each child with illustrations, quotes from students and parents who tried their new recipes, as well as scientific statistics on the need for a healthy diet.
Tasty Testing
Investigate what influences your decision about what you buy to eat.

Preparing Taste Test
1. Explain that consumers make decisions that are influenced by a variety of criteria including appearance, taste, advertising, and cost.

2. Brainstorm a list of criteria that would make a good pear (size, color, variety, taste, texture). Have students vote for which criteria they think is most important.

3. Prepare the pears for the taste test by cutting enough for each student to taste each variety. Serve immediately or treat with lemon juice to prevent browning.

4. Place each pear variety (3-5) on a separate numbered plate.

5. Have students taste each pear and rank them based upon the criteria they determined was the most important.

6. Discuss the results from the taste test.

Classroom Activities

English-Language Arts
- Write a new advertising jingle for the winning product highlighting the criteria.
- Conduct a market test and write an article with artwork for a consumer report that explains the results.
- Research the career of a marketer. How do these professionals help producers and consumers? Interview someone who has a marketing job.
- If students have a hard time determining what is the most important criteria for the taste tests, have a classroom debate to decide which is the most important.

Nutrition and Physical Activity
- Create a 30-second commercial highlighting the product and present it to the class.
- Create a marketing plan, including packaging and target audience.

Materials
- Three to five different kinds of pears
- Small cups for sampling
- Chart paper to collect brainstormed criteria
- Sticky dots or markers for voting

Tip
Try taste tests using other products.

California State Board of Education Content Standards

Grades 9-10
ELA: Writing: 1.3, 1.4

Grades 9-12
Nutrition and Physical Activity: 2.1.N

Grades 10-11
ELA: Listening and Speaking 1.1

Grades 12
History-Social Science: Economics 12.2, 12.3

This lesson can be easily adapted to meet the educational standards for a variety of grade levels.
Frozen, Canned or Fresh?
Cook three different kinds of spinach. The fresh spinach should be well washed, drained and cooked. Give each student group an equal share of frozen, canned and fresh spinach.

1. Show students a package of frozen spinach, a can of spinach and a bunch of fresh spinach. Discuss the nutritional value of spinach. Explain that each group will design an experiment that will examine the visual appearance, taste, texture and smell of all three types of spinach.

2. Brainstorm with the class possible methods of observing and recording the different features of the spinach. Set clear objectives for the experiments, such as experimental design, time restraints and data organization. Allow students time to develop their plan.

3. Have students present their plan to you (and/or the class) for approval. Provide feedback for each group and allow students to revise their plan. Students shall wash their hands, conduct their sensory experiments and record observations.

4. Ask students what conclusions they can make based on the information they gathered. Discuss with the class different ways to present the information. Students create graphs and charts to represent their findings.

5. Instruct groups to present their findings to the class. Ask students to explain which type of spinach they liked best and why.

Objective: Students will design an experiment to compare the flavors and textures of spinach, interpreting their findings with charts and graphs.

Materials:
- 3 frozen packages of spinach
- 3 cans spinach
- 3 bunches fresh spinach
- 3 medium-sized pots
- Hot plate
- Water
- Forks
- Plates
- Napkins

Vocabulary:
- Aftertaste: the persistence of a sensation of flavors when food is no longer present.
- Mouthfeel: food’s physical and chemical interaction in the mouth, used often in the testing and evaluating of foodstuffs.
- Pungent: having a strong odor that stings the nose, especially in acidic or spicy substances.
- Vibrant: of bright color.

California State Board of Education Content Standards

Grade 4: Science: 6a, 6c
Math: Statistics data analysis and probability 1.1, mathematical reasoning 1.0
Health Education: 2.1.N, 3.1.N

Grade 5: Science: 6c, 6g
Math: Statistics data analysis and probability 1.2, mathematical reasoning 1.0
Health Education: 5.1.N

Grade 6: Science: 7b, 6d
Math: Mathematical reasoning 1.0

This lesson can be easily adapted to meet the educational standards for a variety of grade levels.

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