

TEACHERS ACTIVITIES



Theme:

Cooking may be thought of as an art, but at the heart of cooking...is science.

Topics For Discussion:

Discuss with the students some of their experiences with cooking, including what they like to cook, their greatest triumphs, and their worst disasters.



Invite students to share some cooking safety tips. Also discuss the importance of following directions when cooking.



In the program, the worker at the ice cream factory shows how they check cartons of ice cream to see if it really is what the manufacturer claims it is. Discuss why it is important to do this in product development. Invite students to share experiences with purchases they have made in which the product was not what they thought it would, or should, be.



Explore the concept of literacy and the difficulties that people of all ages may have when they cannot read. Include in the discussion how reading is important to specific careers.

Curriculum Extension Activities:

Some lucky children in the video had the job of ice cream taster. Have students write letters applying for such a job. In their letters, they should include their qualifications, experience, and a reason why they should get the job.



Obtain several cookbooks written for children and set up a display in the classroom. Invite students to browse the cookbooks to see how they are organized and what is included in a recipe, and to begin to acquire a "cooking vocabulary." Start a list of cooking terms and have students define them. (Several are mentioned in the video, such as *sauté*, *dice*, *simmer*, *seasoning*, and others.) Add other words to the list as students encounter them.

How to Make an Apple Pie and See the World contains many details that are important to understanding the story. Obtain a copy of the book and make a chart of these story details. For example, the chart might have these headings: Where did she go? How did she get there? What did she get while she was there? As students are supplying details for the chart, encourage them to recall the order in which the story events occurred.



On maps of the world, have students trace the path that the girl in the story took as she gathered the ingredients for apple pie. Her home is not identified, so students will need to think of a starting place, perhaps their own hometown. Number the places on the map in the order of her visits. To make their maps more interesting, they might want to add pictures of the modes of transportation she used from place to place. Their world maps could be used as a vehicle for retelling the story.



Have students invent a new flavor of ice cream and create an advertisement for it that will persuade people to try it.



Enlist the aid of some parent volunteers to acquire some donations and help with a frozen yogurt tasting party. Have the students develop a rating form (e.g., giving a particularly tasty flavor, "3 scoops"; a good flavor, "2 scoops"; an OK flavor, "1 scoop"; and "send it back" for a flavor they don't like). Compile the results to see which flavors students like best.



As a class, make a cookbook of favorite recipes using apples. Feature student-written recipes in the cookbook and solicit some recipes from parents to use as "fillers." Have students add outline drawings to their recipes. Duplicate enough copies for everyone in the class, and have students color the drawings. Send the cookbooks home.



Children are often told to eat something because "it is good for them." Have students research *why* foods are healthy. Use the basic food groups as the basis for the research and pose the question for a food group as a whole, such as "Why are breads and pasta important for our health?" The **Reading Rainbow** review books for this episode, *What Food Is This?* by Rosmarie Hausherr and *The Edible Pyramid* by Loreen Leedy, will be useful in this activity.

Brainstorm a list of different kinds of fruits and vegetables and classify the vegetables into groups as roots, leaves, flowers, stalks, seeds, etc.



Invite a chef into the classroom to talk about the different responsibilities associated with her/his work.

Supplemental Books:

THIS IS THE WAY WE EAT OUR LUNCH
by Edith Baer, illus. by Steve Björkman (Scholastic)

THE WEDNESDAY SURPRISE
by Eve Bunting, illus. by Donald Carrick (Clarion)

SCIENCE EXPERIMENTS YOU CAN EAT
by Vicki Cobb, illus. by David Cain (HarperCollins)

PEAS AND HONEY: RECIPES FOR KIDS (WITH A PINCH OF POETRY)
by Kimberly Colen, illus. by Mandy Victor (Boyd's Mills)

SCIENCE IN FOOD
by George and Shirley Coulter (Rourke)

SCIENCE CHEF
by Joan D'Amico and Karen E. Drummond (John Wiley)

A CHEF
by Douglas Florian (Greenwillow)

FOLLOW AN ICE-CREAM CONE AROUND THE WORLD
by Neale S. Godfrey, illus. by Randy Verougstraete (Silver Press)

PAPA'S STORIES
by Dolores Johnson (Macmillan)

WHERE FOOD COMES FROM

by Dorothy Hinshaw Patent, photos by William Muñoz (Holiday House)

NUTRITION: WHAT'S IN THE FOOD WE EAT

by Dorothy Hinshaw Patent, photos by William Muñoz (Holiday House)

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Description:

With the market closed, a cook travels around the world to gather ingredients for making an apple pie. LeVar joins Chef Curtis Aikens in his kitchen where he creates new recipes. The chef uses science to explain some of the reasoning behind everyday cooking, and he shares the story about learning to read as an adult and that he hid not being able to read when he was younger. We also find out how chemistry is used every day at the Turkey Hill ice cream factory.



Social Studies Concepts:

- ◆ **geography**
- ◆ **culture**
- ◆ **family**
- ◆ **community**



Classroom Activities:

Geography

Have students use a world map to plot the girl in the story's travels as she gathers ingredients for the apple pie. Use the school's location as the beginning place, and have students use self-stick notes to number in order each place she visits on the map. Students can also add a picture of the ingredient she got in each location. Display the map in the classroom so students can use it to retell the story.



Geography

Have partners or small groups of students choose one location from the story and do research to create a poster. The locations include Italy, France, Sri Lanka, England, Jamaica, and Vermont. Students can use resource materials to draw a map of the country or state and fill in important information such as places of interest, products found and produced there, and, if appropriate, pictures of people in traditional dress. Display the posters for students to share with the group.



Culture/Family

The foods we eat are very much a part of our culture. Have students conduct a survey to discover what kinds of apple dishes the class likes best. They may also wish to include other classes or family members in the survey. The results of the survey can be recorded in a bar or line graph. [If apples are grown in your area, arrange a class visit to an orchard.]

Family

Have students discuss their responsibilities for family meal time. Perhaps some have the job of setting the table, clearing the table, emptying the dishwasher, making the salad or dessert, or helping write a shopping list or clip coupons. Talk about the importance of sharing these responsibilities as family members and why it takes less time when we work together towards a common goal. Next have them create a "surprise coupon" for their parents, agreeing to help with a meal for one day – redeemable any time the parents want.



Community

Arrange for the class to visit a Senior Center so students can get to know some community elders and share the book *How To Make An Apple Pie And See The World*, as well as apple pie. Have some students hold the classroom map as other students point to locations while the story is read. Then enjoy a social time as seniors and students eat apple pie together and chat in small groups. Students may want to enlist the help of seniors to put together a class cookbook with the recipes sent from home.



Community

Check out the possibility of inviting a pastry baker to visit the class or of taking a class trip to a local bakery to find out how apple pies, cakes, muffins, bagels, and other baked goods are made. Beforehand, have students create a list of questions they wish to ask, including questions about recipes, work schedules, supply and demand of baked goods, their most and least popular items, and so on.

Do-At-Home Activity:

Favorite Family Recipes

Encourage families to spend time together going through their family recipes to find a favorite for the class recipe book.

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White Out

Key Words: *mixing ingredients, reactions, observations*

Concept: *Ingredients used in cooking may look similar but have different properties that can be described.*

As LeVar and chef Kurtis Aikens were cooking, it was clear that they knew a great deal about the ingredients they were using. To learn about ingredients, chefs must be excellent observers of how different ingredients react with each other. Not all ingredients that look similar react in the same way when mixed with other ingredients.

Materials: Labeled tablespoon samples of salt, flour, and baking soda in small paper cups, large sheets of plain paper such as 11" X 18" white construction paper, pencils, hand lenses, brown paper towels or squares of dark paper (about 10" X 10"), clear plastic glasses, water, spoons, white vinegar, and unlabeled samples of salt, flour, and baking soda in small paper cups.

1. Give small groups of students labeled samples of each of the three white, powdered cooking ingredients (salt, flour, baking soda). Explain to students that although the samples look similar, they are really very different. Have students read the labels on the samples and tell what they know about each.
2. Have each group make a chart on a large piece of paper with the following headings across the top: *Sample, Look, Water, Vinegar* and down the first column: *Salt, Flour, Baking Soda*.
3. Have students place about 1/2 teaspoon of each sample onto a brown paper towel using a spoon (wiping the spoon clean after placing each sample). Next have them look at the samples with a hand lens and write a description of each in the first column of their chart.
4. Then ask students to mix about 1/2 teaspoon of salt into a glass containing 1/4 cup of water, stir the mixture and clean the spoon. After observing the reaction, they should note on their chart how the sample behaved when mixed with water. Repeat the procedure with flour and baking soda.
5. Repeat Step 4 using vinegar in place of water.
6. Ask students to use information on their chart to describe ways in which the samples are alike (*i.e. salt and baking soda both dissolved in water*) and different (*i.e. only the baking soda fizzed when mixed with vinegar*). Then give each group a mystery sample (salt, flour, or baking soda) in an unmarked cup. Ask the students to identify the sample using the information they've noted on their chart. Remind them to look at the sample, mix it with water, and mix it with vinegar before drawing a conclusion.

Enough Dough For Everyone

Key Words: *problem solving, measurement, mixing ingredients, observations*

Concept: *Combining ingredients in different amounts produces different results.*

LeVar states that cooks, like scientists, must make careful measurements and mix ingredients in the correct amounts to get the results they want. Experiment to determine the correct amount of flour for this playdough recipe.

Materials: Note cards, pen, measuring cups, measuring spoons, food coloring, cold water, salt, vegetable oil, cornstarch, flour, large mixing bowls, paper towels, paint shirts or aprons, large spoons, table knives, small bowls, plastic bags.

1. Copy the recipe for playdough onto cards for students. Tell students that they will be experimenting to find the best amount of flour for the recipe. Ask students to predict what might happen if they add too little flour; or too much.

2. Have students put on paint shirts. Then give each group of students a large mixing bowl, a large spoon, $\frac{1}{2}$ cup cold water, $\frac{1}{2}$ cup salt, 1 tsp. vegetable oil, and 1 Tbsp. cornstarch. Have them pour all the ingredients into the large bowl and mix them together. Make each group's playdough a different color by adding about 10 drops of food coloring to their mixtures.

3. Give each group a bowl containing 2 cups of flour, a $\frac{1}{4}$ cup measuring cup, a spoon, and a table knife. Show students how to fill the measuring cup with flour using the spoon and then level off the top with the knife. Tell students to begin by adding just one $\frac{1}{4}$ cup of flour into their mixture and stir it in completely. Have them record this by drawing a picture of one measuring cup on the back of their recipe card.

4. Ask each group to decide if their mixture needs more flour. If they think it does, have them add another $\frac{1}{4}$ cup of flour and record this by drawing another picture of the measuring cup. Have each group continue to add flour, $\frac{1}{4}$ cup at a time, until they feel the playdough is the right consistency for molding. As the mixture becomes stiff, students may need to use their hands to mix in the flour. Encourage them to describe how the mixture changes as they add more flour.

5. When their playdough is done, help each group find the total amount of flour for their recipe by totaling the number of $\frac{1}{4}$ cups used. (Most groups will use 1 to $1\frac{1}{2}$ cups of flour.) Ask students to explain how they knew when their playdough was done by describing how it looked and felt.

6. Have the students work or "play" with the dough. Ask them to examine and describe the playdough made by the different groups. Some may be soft or firm, smooth or bumpy. Encourage students to look for advantages to each. For example, one may be easy to clean-up because it doesn't stick, another may be good for making shapes because it is soft. Store the playdough in plastic bags.

(See *The Life of Bread* next page)

The Life Of Bread

Key Words: *preservatives, bread, food additives, consumer awareness*

Concept: *Preservatives are added to foods to keep them fresh longer.*

The cook in this episode's feature story went all around the world to get the finest ingredients for her recipe. Most of us do our shopping at a local market. However the foods there will have been picked or prepared a day or more ago. To keep these foods fresh tasting, many prepared foods like bread have more than spices added to them, they have preservatives. See how preservatives increase the shelf life of bread.

Materials: Commercial bread (often white bread) containing a preservative (such as calcium propionate or sodium propionate), commercial or homemade bread without preservatives, two shallow pans, water, plastic wrap, paper, pencil, food labels.

1. Show students the labels (or label and recipe card) from the two breads. Have them compare the ingredients in the two loaves. Explain that in addition to the ingredients used to make bread, one contains an ingredient that was added to keep the bread fresh longer. Explain that this is called a preservative.

2. Have students sprinkle a few drops of distilled water on a slice of the bread containing preservatives, place it in a pan, and then cover the pan with plastic wrap. Label this pan as the one with preservatives. Do the same with a slice of bread that does not contain preservatives and label it as not containing preservatives.

3. Have students place the pans on a shelf in a dark cupboard. Ask students to check the pans each day for a week and record any changes they observe in the appearance of the bread slices. After four or five days the bread that does not contain preservatives should begin to have mold growing on it. Several more days will pass before the slice of bread containing a preservative begins to mold.

4. During this time, have students bring food labels from home. Make a list of additives identified on the labels as preservatives. (Some additional examples are sodium nitrate, sodium benzoate, potassium sorbate, and butylated hydroxytoluene or BHT.) Explain to students that although preservatives are very helpful in extending the amount of time a food can be eaten, some people worry about the health effects of adding chemicals to foods. For this reason the Food and Drug Administration is continually testing food additives to make sure they are safe. Ask students to consider which of the two breads tested, they would choose to buy.

Extension: Repeat the activity and place the bread slices in a refrigerator. Students will find that the shelf life of the bread is greatly increased.

It's In The Milk

Key Words: *milk, protein, acids*

Concept: *Milk contains protein.*

Milk, no matter where you get it, is a very common ingredient for cooking in North America. Milk contains protein which is an important part of our diet and an important part of many recipes. Batters made from eggs and milk, both of which contain protein, become solid when heated.

Materials: Vinegar, clear plastic cup, milk, spoon.

1. Have students put two teaspoons of vinegar, which contains a weak acid, in a clear plastic cup.

2. Have them put $\frac{1}{2}$ cup of room temperature milk into the vinegar, stir, and put the mixture aside for about 10 minutes.

3. Have the students look at the milk again. Ask them to describe how the milk has changed. (*It has become a liquid containing solid clumps.*) Explain that the protein in the milk has been changed by the acid in the vinegar. Milk contains many small solid particles that are evenly spread throughout the liquid. Vinegar causes the small particles to clump together. Explain that the solid clumps are called curds and the remaining liquid part is called whey. Have students try to stir the milk and make the curds disappear. (*They will not be able to. Once the protein has been changed it cannot be changed back.*)

C To See

Key Words: *apples, reactions, preservatives, vitamin C, enzymes*

Concept: *Vitamin C keeps apple slices from browning.*

The apples LeVar used looked very fresh, but as soon as he cuts them they will begin to brown. Learn a simple trick for preserving fresh cut apples.

Materials: Apples, table knives, plates, lemon juice, vitamin C tablets, cutting board, large wooden spoon, paper, pencil.

1. Have students cut an apple into slices and place the slices on three plates.
2. Have students label the first plate by writing “Plain” on a sheet of paper and placing it near the plate.
3. Have students sprinkle some lemon juice on the apple slices on the second plate and label it “Lemon juice”.
4. Have students place a vitamin C tablet on a cutting board and crush it using a large wooden spoon. Then sprinkle the crushed tablet on the apple slices on the third plate and label it “Vitamin C”.
5. Ask students to predict what might happen to the apple slices on each plate, then set the plates aside. After about an hour have the students look at the slices again. Compare the appearance of the slices on each of the plates. (*The “plain” slices will be browner than the others.*) Help them understand that the vitamin C in the tablet and in the lemon juice kept the slices from turning brown. Explain that a substance, like vitamin C in this example, which increases the amount of time it takes a food to spoil is called a preservative. Ask students what they might do if they made a salad that contained apple slices? (*Sprinkle lemon juice or vitamin C on the slices to keep them from browning.*)

Science Note: The ascorbic acid (vitamin C) in lemon juice is a natural preservative. When some fruits (such as apples, pears, and bananas) are peeled and exposed to air, enzymes in the fruits begin to react with oxygen in the air destroying fruit cells and causing the fruit to turn brown. The ascorbic acid reacts with the enzymes before they can start destroying the fruit cells.

Spice Of Life

Key Words: *spices, observations, smell, parts of plants*

Concept: *Spices, which are used to enhance the smell and taste of food, come from plants.*

In the story, **How to Make an Apple Pie and See the World**, the cook goes to Sri Lanka to collect cinnamon. She finds that cinnamon, like all spices, is part of a plant — in this case the bark of a kurundu tree.

Materials: White school glue, index cards, marker, squares of light cotton cloth about 8" X 8", cotton balls, whole spices (such as cinnamon sticks [bark], whole cloves [seeds], cardamom seeds, whole nutmeg [seeds], caraway seeds, cumin seeds, dried coriander leaves, dried parsley leaves, bay leaves), 10" pieces of ribbon, egg cartons, scissors, tape, paper, pencils.

1. To make a set of spice cards for each group of students, glue small samples of all the whole spices onto separate index cards. Label the cards with the names of the spices. To make a spice tray for each group, cut the tops off several egg cartons so that you have just the bottom trays. Pour samples of the spices into the egg cups so that each tray has samples of all the spices.
2. Give each small group of students a set of spice cards and some hand lenses. Have students look at the spices glued on the cards. Help them recognize that all the spices are parts of plants such as seeds, leaves, and bark. Depending on the number and kinds of spices used, you may want to have students try grouping the spices by what part of a plant they come from.
3. Tape a spice tray down in the center of each group’s work table. Have them use the hand lenses and the cards to identify the spices in each of the egg cups. Encourage students to smell the spices (but not taste) by pinching a small amount between their thumbs and index fingers, and then returning the spice to the egg cup. Explain that spices are used in cooking to enhance the taste and smell of foods.



• **Measurement in cooking.** LeVar's recipe for "Apple Raisin Muffins" is included below. Use this recipe or one for a different dish containing apples for cooking in the classroom. Emphasize the importance of accurate measurement of ingredients when cooking, and point out such details in the recipe as time and temperature of cooking. This recipe makes approximately 12 muffins. Have students figure out how they will need to modify the recipe in order to make enough for their class.

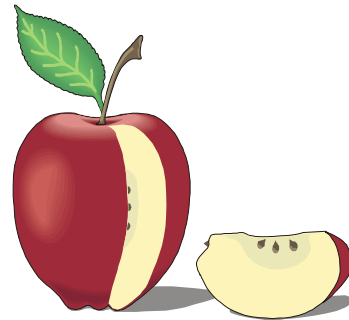
LeVar's Apple Raisin Muffins

Mix the following ingredients and set aside:

- 1/4 c. sugar
- 1 3/4 c. flour
- 3/4 tsp. salt
- 2 tsp. baking powder
- 1 tsp. cinnamon

Mix these ingredients:

- 2 eggs, beaten
- 2-4 Tbsp. cooking oil
- 1/2-3/4 c. milk



Directions: Add the dry ingredients to the liquid mixture and stir just until the dry mixture is moistened. Gently stir in 1 c. chopped apples and 1/2 c. raisins. Spoon into greased muffin tin or paper muffin cups. Bake in 375° oven for about 25 minutes.

- **Making a timeline.** Have students create a timeline of events in the story, starting with finding the market closed and ending with eating apple pie.
- **Using ordinal numbers.** Using a large map of the world, have students retell the story, incorporating the use of ordinal numbers to highlight all the places the character visited. (Her starting place is not mentioned in the story. Students will need to decide on a spot, perhaps their own hometown.)
- **Calculating distances.** Using mileage tables and a large map of the world, have students calculate the distance in miles that the main character traveled on her trip. They will need to select a starting spot and cumulatively add the distances from one location to the next. This activity might provide calculator practice.
- **Estimation.** Have students estimate how many apples are needed to make the one cup of chopped apples called for in LeVar's recipe. Include in the discussion such factors as size of the apples and how tightly packed the apple pieces are in the measuring cup. Have students estimate the circumference of an apple by cutting a piece of red yarn to the length they believe is the distance around the apple at its roundest portion. Have them compare their estimates with a piece of yarn cut to the actual circumference.

- **Fractions.** While preparing apples for cooking or baking, have students explore different ways of cutting an apple into fractional parts. When cutting the apple lengthwise, the yarn from the estimation activity above may be useful for determining pieces that are equal in size. Using yarn that has been cut the length of the circumference of the apple, have students measure that length with a ruler and figure the one-half mark and the one-fourth and three-fourths marks. They then place the piece of yarn around the apple and make a tiny cut to show one-half, cut the apple in half, and use the yarn again to help them cut each half into halves. Also have students experiment with cutting an apple in half and fourths crosswise. Discuss the possibility of obtaining pieces of equal size by cutting crosswise compared to cutting the apple lengthwise. Take advantage of the opportunity provided by cutting crosswise to discuss the star pattern made by the apple seeds. (If possible, have some extra parent volunteers to assist with the cutting.)

Do-At-Home Activity

- **Creative Problem Solving.** Involve parents in helping their children devise creative responses to this question: "What can you do with an apple?" Stipulate that their responses must be math-related. Have families record their ideas on the reproducible page. Send an apple home with each child to inspire thought. Ask students to return their page of ideas to school, and share the responses. Do a tally of the number of different ways they suggested. They may want to compile an apple math book of their ideas, called " ____ Ways to Use an Apple."

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