Agricultural Literacy Week

New York Agriculture in the Classroom 2016 Educator Resource Guide

Dear Educator,

It is necessary to begin our Agricultural Literacy Week celebration by thanking you, our teachers, for welcoming agricultural literacy volunteers into your classroom. New York agriculture is thriving, and we are in the middle of an amazing food renaissance; people want to better understand where their food comes from and know the farmers who produce that food. Inviting this program into your classroom is a vital step in developing a connection between your students, their food, and those who produce a safe and abundant food supply.

The Apple Orchard Riddle will engage your students with the apple industry in New York. Our state has been a pioneer in apple research and production for more than a century, with Cornell University developing more than 65 new varieties of apples since 1880. New York is the second largest apple producing state in the country, and your students may have visited an apple orchard with their family or through a school trip. This book has a fun storyline that will have your students learning about all the different functions at an orchard, and working to help answer the big riddle.

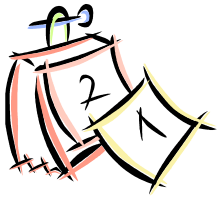
By participating in this program you are joining thousands of teachers and tens of thousands of students in exploring New York's food and fiber system, which is an industry you and your students interact with every day. We would like to thank our teachers who graciously find the time and opportunities for our volunteers to come into their classrooms, the 1,200 volunteers who read to more than 51,000 students, and the County Coordinators who make the event possible in every community.

Sincerely,
Katie Bigness
Coordinator, New York Agriculture in the Classroom

2016 Agriculture in the Classroom Opportunities

- Earn up to 6 hours of professional development credit by participating in a *Food, Land and People* educator training. The *Food, Land and People* curriculum is aligned to NYS and the Common Core Learning Standards, and includes 55 lessons developed and tested by thousands of educators.
- The I Love New York Agriculture Contest allows students to explore where their food comes from, and is easily integrated into any curriculum. The theme for 2016 is "Agriculture and the Environment", and entries are due May 2, 2016.
- The National Agriculture in the Classroom Conference will be in Phoenix, Arizona from June 20 to June 24, 2016. Meet peer teachers from across the country and engage in professional development in increasing agricultural literacy in your curriculum.

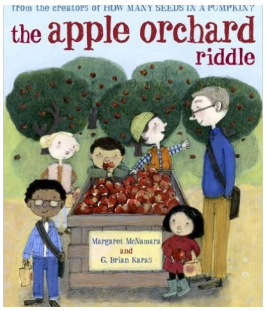
Facebook.com/NYAITC @NewYorkAITC Pinterest.com/NYAITC



Mark Your Calendar

Next year's Agricultural Literacy Week will be held *March 20-24, 2017*. Join us again for great volunteers, and strong connections to our food and fiber systems in your classroom.

The Apple Orchard Riddle



Grade Level: K-3

Common Core 2nd Grade ELA Standards Met:

RI.2.3, RI2.6, RI.2.7, SL.2.1, SL.2.2

Time: 30 minutes

Materials: *The Apple Orchard Riddle* book,15 portion cups, 4 oz. lemon juice, 2-3 additional substances (water, vinegar, salt, baking soda, etc.), 3 apples, cutting board, knife (for adults), paper towels, marker

Extensions: For related lessons and extensions, please visit www.agclassroom.org/ny

Apple Oxidation

Helpful Hints and Program Preparation:

- Read the book and the activity plan several times before you work with your classes.
- You may consider cutting an apple the evening before the presentation, with one piece of apple in lemon juice and one piece with no substance on it. This would allow students to see an intense browning of the apple.
- Each classroom will have 15 portion cups, allowing for 3 groups with 5 portion cups each. You could also use less substances and break up with classroom into smaller groups as an alternative.
- You may want to use tabs or sticky notes on the pages of the book where you have specific talking points, or where you would like to ask the students questions.
- Don't forget to give this Educator Resource Guide to the teacher before you leave!

Introduction (5 minutes):

1. Introduce yourself; explain your relationship to agriculture, and why it is important to you.
2. Explain the plan for your time together: We will be learning about apples and the characteristics that make them so unique and important in our diets and in New York.

Lesson and Activity (15 minutes):

Background:

New York is a leader in apple production and research; it is an amazing industry with huge economical and healthful impacts for our state. As a widely loved and versatile fruit, apples are commonly paired with a school lunch or served as a snack and students are very familiar with their delicious taste and crunch. But do students know the importance of apples in New York? Our state produces over 29.5 million bushels of apples each year, and provides 17,500 direct and indirect jobs related to the industry – it takes many people to feed a world hungry for New York grown apples. With more than 50 varieties of apples grown in our state, The Apple Orchard Riddle book and activity will help build student awareness about apples and their prominence in New York agriculture.

Objectives:

1. Identify three substances that will not stop an apple from browning, and one that will prevent browning.
2. Understand the reason why an apple's flesh turns brown.

Lesson Procedure:

1. Ask students to think about the last time they ate an apple. Call on students to describe what color the apple was, size, texture. How did it taste? Did they eat it plain, or with something else? What sound did the apple make when they bit into it? Ask if they know what happens if you cut an apple and then leave it out on the counter for a period of time? (It browns.)

Lesson Plan & Extension Activities

Lesson Procedure, continued:

2. Explain to the students that today you are going to do an experiment to learn what liquids can stop apples from browning after they have been cut, and why browning occurs. At the front of the room, cut each of the three apples into chunks for their experiment.

3. Break the students into three groups. Each group should have 5 portion cups, lemon juice, 3 additional substances (such as vinegar, water, salt, etc), and their 5 apple chunks.

4. Label the portion cups 1-5, and write on the board which number corresponds to which substance. Cup 1 should serve as the control, and no substance should be used. In cups 2-5, cover the apple pieces with lemon juice and the other three substances. ***Be sure to note that the students should not eat the apples used in the experiment.***

5. Ask students to hypothesize which substance they believe would be best to prevent browning, and why. The apples need to sit about 10-15 minutes.

Reading Aloud (10 minutes):

While the apples sit to oxidize, ask the students to gather in the reading area of the classroom. Read *The Apple Orchard Riddle* by Margaret McNamara.

Lesson Procedure, continued:

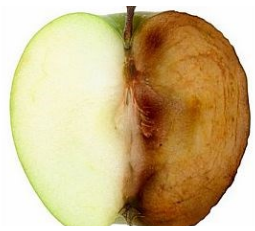
6. After reading the book, have the students return to their groups to observe the changes in their apples. They can take the apples out of the portion cup and place the chunk on a paper towel, or just view inside of the cup. The students should discuss together how their apples have changed. Ask each group to share their findings. They should report that the all the apples have changed color, except the one in lemon juice.

7. Explain to the students that apples brown as a response to being cut. When the apple has this injury to it's flesh, oxygen (air) touches the flesh and it starts to turn brown.

- The apples naturally produce PPO (polyphenol oxidase), and when oxygen mixes with the PPO it creates rust, or the red-brown color on the apple.
- Lemon juice contains Vitamin C (ascorbic acid), and when you put lemon juice on a cut apple the oxygen reacts first to the Vitamin C, keeping your apple from turning brown.
- If the apple sits out long enough, the oxygen will use up all the Vitamin C coating the apples, and the apple will then begin to turn brown.

Program Conclusion:

- Ask the students to name substances that will not slow down browning, and one that will slow browning.



www.foodpyramid.com

Lesson Addition or Alternative:

- Cut an apple in half and have the students identify the following components: flesh, skin, seeds, stem , and calyx.

Common Core Domain Connections

Kindergarten

1. The Five Senses
2. Plants
3. Farms
4. Seasons and Weather
5. Taking Care of the Earth

1st Grade

1. The Human Body
2. The History of the Earth
3. Animals and Habitats
4. A New Nation

2nd Grade

1. Cycles in Nature
2. Insects
3. The Human Body
4. Fighting for a Cause

For additional information about connections to the Common Core, extension activities and videos visit: www.agclassroom.org/ny

Teacher Program Evaluation

Win a New York Agriculture in the Classroom prize pack just for teachers! Please take a few short moments to follow the link below and complete a survey to evaluate the Agricultural Literacy Week program, resources, and the presentation that took place in your classroom.

Teacher feedback is invaluable, and helps to shape the direction of all of our programs.

Follow the web address below and complete this evaluation before May 2, 2016. Multiple teacher names will be drawn at random to win prize packs of a $50 value.

https://www.surveymonkey.com/r/ALW16

Apple Innovation

Thanks to the research at Cornell University, new apple varieties are being created all the time. Ruby Frost apples are one of varieties most recently introduced to the market, and they are an apple that oxidizes very slowly, and take longer to brown.

These new apple varieties are created through cross-breeding, or taking the desired qualities of two or more apples and creating something new. This process starts very low-tech, where researchers hand -pollinate apple blossoms before the bees have a chance to pollinate the blossoms. Learn more at www.agclassroom.org/ny.

Vocabulary

Orchard - Land planted with fruit trees

Cider- A drink made by crushing fruit such as apples

Varieties - A thing that differs in some way from others of the same class/grouping or general name

Ripen - Process in which fruits become sweeter, less green and softer

Burrow - A hole or tunnel dug by a small animal

Pulp - Tiny pieces of a fruit resulting from being chopped and mashed

Canvas - A strong, coarse cloth

Sterilize - To make something free of bacteria or other living microorganisms

For additional vocabulary, photos, and a Quizlet please visit

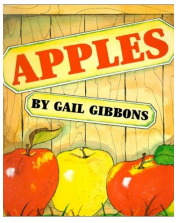
www.agclassroom.org/ny

Additional Information and Resources

Books:

An Apple Tree Through the Year by Claudia Schnieper
Trace the development of an apple tree from bud to fruit.

Apples by Gail Gibbons
Learn how and when apples were brought to America and the role of Johnny Appleseed (John Chapman).



Web Resources:

New York Apple Country
A wealth of primary source information regarding apple varieties, production, and health benefits in New York State.
http://goo.gl/RBso1S

Apple Model
Create a paper model to learn the parts of the apple.
http://goo.gl/Goi7QG

Five Senses Apple Investigation
Students can explore apples as they related to all of their five senses. They will create a chart detailing their sensory perceptions.
http://goo.gl/Goi7QG

About New York Agriculture in the Classroom

Mission: To foster an awareness, understanding, and appreciation of how we produce food, fiber, natural resources by engaging educators and students with agriculture and food systems.

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