Field Trip #3

Apples are Awesome!

MAIN IDEAS

- Some fruits grow on trees. A group of fruit trees is called an orchard.
- Kentucky farmers watch the life cycle of fruit trees very carefully to care for the fruit and determine when it is ready to be picked.
- Pollinating insects are important for apple development on trees.
- Apples may be sold by weight in units called bushels and pecks and fractions of bushels and pecks.

BEFORE WATCHING THE VIDEO

Develop a cluster of apple words by asking students, "What do you think of when you hear the word 'apples'?" Record their responses on a board.

Background Information

Source: US Apple Association - www.usapple.org

Apples are grown in every state in the continental U.S. Top-producing states include Washington, New York, Michigan, Pennsylvania, California and Virginia.

Only sour crab apple trees were native to America, until European settlers arrived and brought with them their English customs and favorite fruits. Native Americans appropriated what they liked, cultivating apples extensively.

The first American orchard was planted around 1625 by William Blackstone on Boston's Beacon Hill. The first governor of Massachusetts Bay Colony, William Endicott, was a distinguished orchardist. Endicott's account book noted his children had set fire to part of his operation, destroying 500 trees, a very considerable operation at that time in history. Well-known American apple orchardists include George Washington and Thomas Jefferson.

Most apples are harvested between late August and October. Each apple is hand picked by people using ladders and cloth buckets.

The average annual U.S. apple crop is 224 million bushels. Each bushel contains on average 126 medium-sized apples.

USDA recommends at least 1-2 cups of fruit per day for children and adults based on gender and age. So, start with apples: Fat-, sodium-, and cholesterol-free, an excellent source of fiber (5g/apple), and weighing in at only 80 calories each (for a tennis ball-sized apple).

1 small apple = 1 cup.

Be sure to eat the whole apple. Health-promoting phytonutrients can be found throughout, but the bulk of antioxidants – including a big dose of vitamin C – are concentrated in or just under the skin.

There are more than 2,500 apple orchards (fruit tree farms) in Kentucky.
- Source: USDA 2012 Census

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Kentucky Academic Standards

PRACTICAL LIVING & VOCATIONAL STUDIES

Consumer Decisions

SCIENCE

Interdependent Relationships in Ecosystems

Inheritance and Variation of Traits

MATH

Measurement and Data: Represent and Interpret Data.

Correlating Lessons & Resources

LESSON: Buzzy, Buzzy Bee
Provided by Food, Land, and People, this lessons helps students understand a bee's role in pollinating apple blossoms.

WHILE WATCHING THE VIDEO

Have students watch for answers to the following questions while they watch the video, or they may write answers on a piece of paper:

1. About how old is an apple tree when it first produces fruit?
2. Many farmers watch the calendar to know when the apples are ready to pick, but what is the best way to tell?
3. How do farmers prepare the apples to sell?

AFTER WATCHING THE VIDEO

OPTION 1: COMPARING APPLES TO APPLES

Grade Level(s): K - 4

Estimated Time: 40 - 60 minutes

Purpose

- Students will use their senses to evaluate different types of apples and select their favorite. *PL.2.30 Students evaluate consumer products and services and make effective consumer decisions.*
- Students may develop a bar chart to report results. *2-3.MD - Represent and interpret data.*

Materials

- 3-4 apples of 5 different varieties. Be sure to provide a mix of color, firmness and taste. See descriptions below.
- "Comparing Apples" Data Sheet
- "Our Favorite Apples" Reporting Sheet

Optional Materials

- BOOK: *The Apple Orchard Riddle* by Margaret McNamara

Background Information

Source: http://usapple.org/all-about-apples/apple-varieties/

More than 100 apple varieties are grown commercially in the United States, but 15 popular varieties account for almost 90 percent of production. A few were omitted from this list due to limited availability locally.

AMBROSIA - In Greek mythology, "Ambrosia" refers to "food or drink for the Gods." It's no myth: You'll love the Ambrosia's tender-sweet, heavenly taste. Ambrosias have smooth yellow-pink skin, a floral aroma, and slight honey flavor. Perfect for snacks, salads, and baking – and available fall through winter.

BRAEBURN - The Braeburn originated in New Zealand in the early 1950s. It was a chance seedling, with Lady Hamilton and Granny Smith as possible parents. Now grown in the United States, Braeburn is a multipurpose apple good for all types of apple uses. Its color varies from orange to red over a yellow background. A crisp, juicy apple, the Braeburn has a rich, spicy-sweet flavor. U.S. Braeburns are available beginning in October through July.

CAMEO - Discovered as a chance seedling in a Washington State Red Delicious orchard about 30 years ago, the Cameo is now available in supermarkets nationwide. With bright red stripes on an orange background, it actually has a brighter, more lemony flavor than its Red Delicious cousin. Firm, sweet and a favorite apple for slicing up and serving as a snack. Available late fall through early spring.

CORTLAND - Founded more than 120 years ago by horticulturists in New York State, Cortland has a yellow-green skin with lots of red and even bluish accents. Beautiful and tart, it's a tender apple that browns slower than most when sliced, so it's a "smart" choice for serving up as a snack or in a salad. You'll mainly find this apple in the East and Midwest in the fall through early winter.

CRISPIN - The original name for this exceptional apple was Mutsu, reflecting its Japanese heritage. It was renamed Crispin in the late 1960s and has been gaining fans ever since. Sweet, refreshing and super crisp, these apples are excellent for eating, baking, freezing, or cooking into sauce. They are also good for salads and pies. Available almost year round.

EMPIRE - Empires premiered in 1966 in the Empire State of New York. They are a cross between Red Delicious and McIntosh developed by the New York State Agricultural Experiment Station. This crisp, juicy apple has a delightful sweet-tart flavor and creamy white flesh, making it a good all-purpose apple. Stake out your Empire between September and July.

FUJI - Originally developed in Japan in the late 1930s and named after the famous Mt. Fuji, U.S.-grown Fujis began appearing in markets in the 1980s. Fuji is a cross between Ralls Janet and Red Delicious. This variety's popularity is skyrocketing, thanks to its sweet flavor and firmness. Fuji apples are bi-colored, typically striped with yellow and red. They are available year round, beginning in September.

GALA - This variety, a cross between Kidd's Orange Red and Golden Delicious, originated in New Zealand. The Royal Gala strain was named in honor of Queen Elizabeth II, who deemed it her favorite during a visit to New Zealand. It was brought to the United States in the early 1970s and is now one of the country's most popular apples. Crisp, juicy, and very sweet, Gala is ideal for snacking. Galas can vary in color, from cream to red- and yellow-striped. U.S.-grown Galas are harvested beginning in mid-July and are typically available year round.

GOLDEN DELICIOUS - Yellow with an occasional pink blush, Golden Delicious is "Apple Lite" – loved by those who prefer a mild, sweet flavor. There's nothing tart about this apple....just a buttery, honey taste to please. Great for baking into apple pies and crisps mixed with more tart apples like Granny Smiths. It makes for a great flavor combo that tickles all your taste buds, all year round.

GRANNY SMITH - This Australian native was discovered in 1868 as a chance seedling by "Granny" Anne Smith of Ryde, New South Wales. One parent might have been a French crabapple. Grannies are known for their distinctive green flesh – which sometimes bears a red blush – and their very tart flavor. An all-purpose apple, Grannies work equally well as a snack or in pies and sauce. U.S. Grannies are harvested beginning in August and are available year round.

HONEYCRISP - This honey of an apple has a honeyed, mild flavor and a crispness deemed explosive. Juicy and sweet, this popular newcomer is a cross between a Macoun and a Honeygold. Honeycrisp's skin is a distinctive mottled red over a yellow background, with coarse flesh. This apple is good for snacking, salads and sauce-making and stores well. Honeycrisp is "college educated," developed by the University of Minnesota. Supplies are limited but growing with harvest beginning in September.

JAZZ - Like its namesake music, Jazz is mellow with a bit of everything working together perfectly. Medium sized and scarlet red, with yellow-green patches, it's sweet like the Honeycrisp – and nice and firm like the Pink Lady. Smells delicious and is refreshingly juicy – great for snacking and baking. Available year-round.

JONAGOLD - A blend of Jonathan and Golden Delicious apples, New York native Jonagold offers a unique honey-tart flavor and crispy, juicy, nearly yellow flesh. It debuted in 1968, a product of the New York State Agricultural Experiment Station. With a yellow-green base skin color and a red-orange blush, it is excellent both for eating fresh and for cooking. Jonagold is typically available October through July.

MCINTOSH - This old, well-known variety was discovered as a chance seedling by John McIntosh in 1811. Its deep-red finish sometimes carries a green blush. Juicy, tangy, tart McIntosh has a tender, white flesh. It is best used for snacking and applesauce, but some people enjoy its tart flavor in pies as well. This apple is typically available from September through May. Cook's hints: McIntosh cooks down easily; if pie making, cut slices thick or add a thickener.

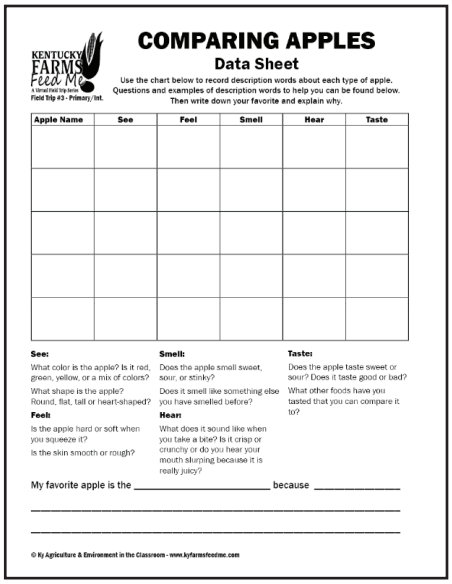
RED DELICIOUS - The most widely recognized of all U.S. apple varieties originated in Iowa in the 1870s. This sweet, crispy, juicy apple varies in color from striped red to solid midnight red. Western Red Delicious are elongated in shape, with pronounced "feet." Eastern-grown Delicious are more round. This apple is best eaten fresh or in salads.

Procedures

Source: Green Mountain Farm to School

Students will get to taste five different varieties of apples and compare their different appearances and tastes.

1. Explain to the students that a single food can have many different varieties, like apples. Different varieties, or types, can taste slightly different and be used for different things.
2. What might we look for in apples that we would buy? (color, size, taste -- eating, cooking, sauce, storage, pest-free)
3. As you introduce each type of apple, and prepare it for the taste test, ask your K/1 students about the color, appearance, and what they think it will taste like. Encourage them to use descriptive words.
4. Make sure students' hands are washed. Place apple slices on individual plates or napkins. They should try hard to observe the flavors and textures of each apple that they taste!
5. Have older students use the "Comparing Apples" data sheet to make their notes about color, shape, taste, firmness, and sound when taking a bite.
6. Have each child determine their favorite by raising their hand. They can record the data for each apple on the "Our Favorite Apples" reporting sheet. They may use that data to make bar graph.



COMPARING APPLES

Data Sheet

Use the chart below to record description words about each type of apple. Questions and examples of description words to help you can be found below. Then write down your favorite and explain why.

Apple Name	See	Feel	Smell	Hear	Taste

See:
What color is the apple? Is it red, green, yellow, or a mix of colors?
What shape is the apple? Round, flat, tall or heart-shaped?

Feel:
Is the apple hard or soft when you squeeze it?
Is the skin smooth or rough?

Smell:
Does the apple smell sweet, sour, or stinky?
Does it smell like something else you have smelled before?

Hear:
What does it sound like when you take a bite? Is it crisp or crunchy or do you hear your mouth slurping because it is really juicy?

Taste:
Does the apple taste sweet or sour? Does it taste good or bad?
What other foods have you tasted that you can compare it to?

My favorite apple is the _____ because _____

_____

_____

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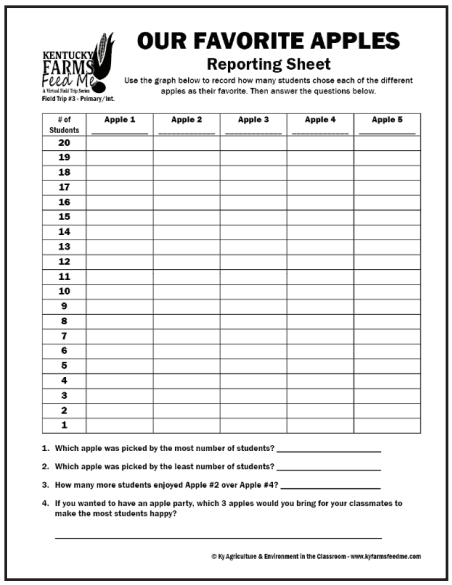

OUR FAVORITE APPLES

Reporting Sheet

Use the graph below to record how many students chose each of the different apples as their favorite. Then answer the questions below.

# of Students	Apple 1 _____	Apple 2 _____	Apple 3 _____	Apple 4 _____	Apple 5 _____
20					
19					
18					
17					
16					
15					
14					
13					
12					
11					
10					
9					
8					
7					
6					
5					
4					
3					
2					
1					

1. Which apple was picked by the most number of students? _____
2. Which apple was picked by the least number of students? _____
3. How many more students enjoyed Apple #2 over Apple #4? _____
4. If you wanted to have an apple party, which 3 apples would you bring for your classmates to make the most students happy?

_____

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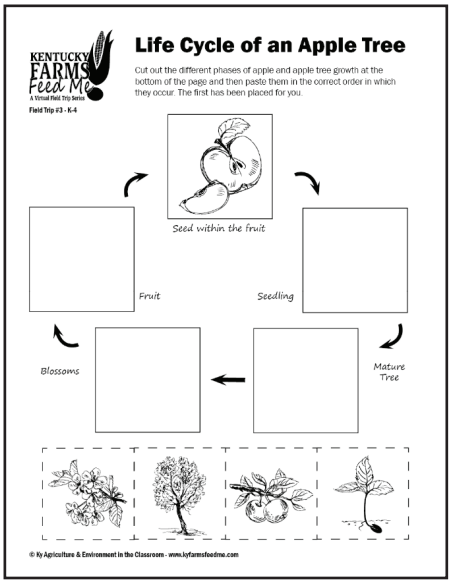
OPTION 2: LIFE CYCLE AND POLLINATION

Grade Level(s): 2-3

Estimated Time - 60 minutes

Purpose

- Students will construct a diagram of an apple tree's life cycle.
  3-LS1-1. Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.
- Students will develop a simple model that mimics the function of bees in pollinating apple blossoms.
  2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
  3-LS2-1. Construct an argument that some animals form groups that help members survive.



Life Cycle of an Apple Tree

Cut out the different phases of apple and apple tree growth at the bottom of the page and then paste them in the correct order in which they occur. The first has been placed for you.

Seed within the fruit

Fruit

Seedling

Blossoms

Mature Tree

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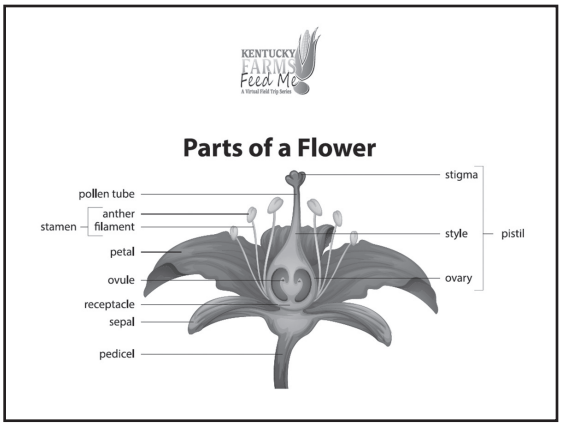
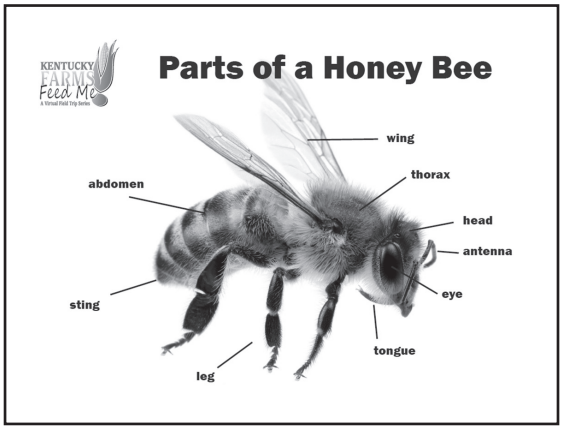
Materials

- "Life Cycle of an Apple Tree" Activity Sheet
- "Buzzy, Buzzy Bee" Lesson from Food, Land and People - Copy provided in **Companion Materials** packet.

Optional Materials

- BOOK - *How Do Apples Grow* by Betsy Maestro
- DIAGRAM - Parts of a Flower - Copy provided in **Companion Materials** packet.
- DIAGRAM - Parts of a Honey Bee - Copy provided in **Companion Materials** packet.





Background Information

Source: http://www.usapple.org.

In winter, the apple tree rests. On the branches are buds, some of which contain leaves and others that contain five flowers. With warmer spring weather, the leaf buds unfold and flower buds begin to grow on the ends of the twigs.

Honeybees are attracted to apple flowers by nectar and the scent of the petals. As the bee collects nectar, it also picks up pollen. When the bee lands on a flower on another tree, it brushes against the pistil of the flower, leaving pollen grains on the sticky stigma. The pollen grains send tubes down through the styles to reach the ovary (pollination). Through the filament, the sperm's pollen can reach the ovules that are in the ovary. The fertilized ovules will become seeds.

The outer wall of the ovary develops into the fleshy white part of the apple. The inner wall of the ovary becomes the apple core around the seeds.

In summer, the apples grow bigger and gradually change color, and the tree produces new growth. In fall, the apples ripen. About two weeks before the harvest, the apples' food supply from the tree is cut off and the apples become sweeter. Most apples are harvested by hand, primarily in September and October.

Source: Ky Ag & Environment in the Classroom - Even though apple trees can be grown from a seed, most farmers use grafted saplings, or young trees, they receive from a nursery. Farmers do this to control the apple variety and size of the tree. If you plant an apple seed, you need to plant more than one (apple trees are not self-pollinating). The tree will also grow very large, and it may take 5 to 8 years before it produces any fruit. A grafted, dwarf tree will produce fruit much sooner, at about 3 years.

Procedures

1. After watching the video and/or reading the book *How Do Apples Grow*, give students the "Life Cycle of an Apple Tree" activity sheet to complete.
2. Discuss similarities and differences of the apple life cycle with other fruits.
3. Complete the "Buzzy, Buzzy Bee" lesson provided in the **Companion Materials** packet if time allows.

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COMPARING APPLES

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Taste:

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My favorite apple is the _____ because _____

_____

_____

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Field Trip #3 - Primary/Int.

OUR FAVORITE APPLES

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Field Trip #3 - K-4

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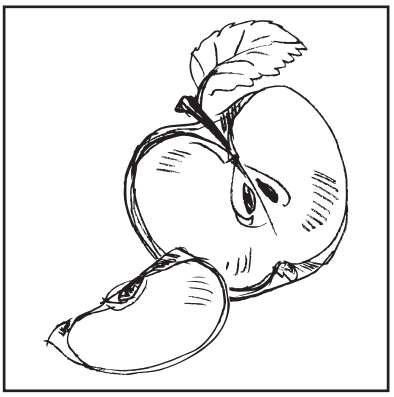

Seed within the fruit

Seedling

Mature Tree

Blossoms

Fruit