HARVEST OF THE MONTH - OCTOBER / APPLES

Grades 6 - 8

KANSAS STATE DEPARTMENT OF EDUCATION

Kansas leads the world in the success of each student.

JULY 28, 2025

Kansas State Board of Education

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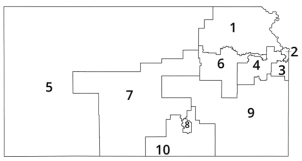

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SUCCESS DEFINED

A successful Kansas high school graduate has the

- Academic preparation,
- Cognitive preparation,
- Technical skills,
- Employability skills and
- Civic engagement

to be successful in postsecondary education, in the attainment of an industry recognized certification or in the workforce, without the need for remediation.

OUTCOMES

- Social-emotional growth
- Kindergarten readiness
- Individual Plan of Study
- Civic engagement
- Academically prepared for postsecondary
- High school graduation
- Postsecondary success

Kansans CAN

MISSION

To prepare Kansas students for lifelong success through rigorous, quality academic instruction, career training and character development according to each student's gifts and talents.

VISION

Kansas leads the world in the success of each student.

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Kansans Can

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Kansas leads the world in the success of each student.

July 1, 2025

HARVEST OF THE MONTH

October / Apples

INTRODUCTION

Over the next few weeks, we will be learning about a kind of food that we grow in Kansas. I'm going to give you some clues to see if you can guess what this food is.

This is a round fruit that can be red, yellow, or green. Show where fruits are found on a MyPlate.gov poster.

- This fruit grows on trees and can be sweet or tart.
- They are a healthy snack that is full of vitamin c and fiber.
- They have a peel on the outside of the fruit that you can eat.
- Peel- the outer layer of fruit
- They have 5 seed pockets in their cores.
- Core- the hard center part of certain fruits
- Some well known varieties of this fruit are called pink lady, golden delicious, red delicious, and granny smith.
- People eat this fruit raw, as juice, in pies, as chips, and cook and mash them up and eat them.

Can you guess what food I'm talking about? We will be learning about apples!

Optional: You could also place an apple in a brown paper bag and let the children reach in and feel it without peeking to see if they can guess what it might be as you give the clues.

VOCABULARY

Variation: Differences between individuals in a group

Traits: Features or characteristics that are passed down from parents to their children

GENERAL RESOURCES

ENGAGE

Show students apples of different types such as gala, granny smith, honeycrisp, and any other that might be available in your location. Pose the question: If these are all apples, what are ways they are different?

Allow students to share different ways they could classify apples by. Document these ideas on the whiteboard or on large poster paper.

Share with students that as a class, they are going to work together to gather evidence about what causes these apples to be different through how they have been reproduced.

EXPLORE

Divide the students into groups of three or four. Provide each group with a Gala, Granny Smith, and McIntosh apple (or other similar varieties); one measuring tape; one scale; and an Apple Data Sheet[1] for each student.

1. Have students record the color and smell of each apple variety on their data sheets.
2. Have students predict each apple's weight in grams and circumference in centimeters.
3. Have students measure the actual weight and circumference of each apple.
4. Have students make a prediction about how many seeds are in each apple.

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1 https://cdn.agclassroom.org/media/uploads/2016/12/06/apple_science_datasheet.pdf

5. Cut each apple open for the groups, designating one slice for observing how long it takes the apple to turn brown. Ask students to observe the inner characteristics of the apple and record on their data sheets the color of the inside flesh and the actual number of seeds inside each apple.

6. Cut each apple into small sections and allow students to taste the differences among the apples. As they are tasting, remind them to pay attention to the texture (crunchy, juicy, etc.) of the apple as well as the flavor. Be sure to follow proper health and safety regulations for step 7, or ask the cafeteria workers to slice the apples for tasting. Have students record their observations on the data sheet.

7. Using the background information, explain to students why apples turn brown after they are cut. If any of their apples have started to turn brown, have them record on their data sheets that these varieties are fast to brown. Ask them to continue observing their cut apples to compare their rate of browning as you do the next activity.

8. Discuss the variation that students observed between different apple varieties. Explain to students that these variations are examples of traits that can be passed from parent to offspring.

EXPLAIN

1. Show students the How Does it Grow? Apples [2] video.

2. Use the following discussion questions to explore the video:

   Why don't farmers grow apples from seed? (Each seed is genetically unique, meaning that when it grows into a mature tree, the apples it produces will be different from those produced by its parent trees.)

   What is grafting? (The process of joining a cut stem—or bud—with the trunk of another tree so that the two grow together.)

   Why do apple farmers graft their trees? (Grafting allows farmers to "clone" the apple trees that produce the fruit they want. A grafted branch has the same genetic makeup as the tree it was taken from.)

   Do all apple varieties ripen at the same time? (No, some varieties ripen earlier than others, so planting different varieties allows farmers to extend their length of harvest.

3. Explain to students that apples have been selectively bred for thousands of years to produce the varieties that we know today. Apple breeders, unlike farmers, plant apple trees from seed in order to find and develop new traits. Under human cultivation, the traits that give apple trees a survival advantage are the traits that are most useful and desirable to people. Ask students to brainstorm all the different traits they can think of that might be desirable in an apple tree (e.g., pest resistant, grows fast, has strong branches, produces big apples, juicy apples, sweet apples, crisp apples), and write them on the board.

   Circle all the traits that are directly related to the fruit of the apple tree (e.g., produces big apples, juicy apples, sweet apples, crisp apples). Point out that these are like the characteristics that students observed and recorded on their Apple Data Sheets[3].

   Read aloud with students the book Apples to Oregon by Deborah Hopkinson

2 https://cdn.agclassroom.org/media/uploads/2016/12/06/apple_science_datasheet.pdf

3 https://cdn.agclassroom.org/media/uploads/2016/12/06/apple_science_datasheet.pdf

ELABORATE

Testing Apple Ripeness

Apple growers try to pick their apples at precisely the right time. They have several ways to test for ripeness that students can try in the classroom. These observations will work best with apples picked in the early fall when you can find varying stages of ripeness—they will not work well with apples from the grocery store.

1: Seed Color Test

Rate the color of the seeds in the apple. A ripe apple has brown seeds. Apple growers use the following scale:

- 1 = clear (no color)
- 2 = trace of color (tips of seeds are brown)
- 3 = 1/4 color
- 4 = 1/2 color
- 5 = 3/4 color
- 6 = fully brown

2: Flesh Color Test

Check the flesh color of the apple by holding a very thin slice—about 1/16th of an inch (1.58 mm)—up to a bright light. A ripe apple has almost no green flesh. Apple growers use the following scale:

- 1 = flesh all green
- 2 = some loss of green from center of fruit
- 3 = heavy green band 1/2 inch (1.27 cm) thick under skin
- 4 = heavy green band 1/4 inch (6.35 mm) thick
- 5 = heavy green band 1/8 inch (3.17 mm) thick
- 6 = green essentially gone from under skin

Have students give their apple a rating from 1 to 6. Remind students that these tests for ripeness involve a skill that scientists must develop—the ability to make careful observations.

3: Starch Test

Divide the class into groups. Give each group an apple, and have them cut the apple in half at a right angle to the core. Apply iodine to the cut surface, drain away any excess, and allow it to stand for a few minutes. (Emphasize that iodine is poison and is not to be taken internally.) The apple will turn a dark purple or blue-black wherever starch is present. Remind students that in a ripe apple the starch has changed to sugar, so a ripe apple will have very little dark stain. Have students give their apple a rating from 1 to 6 based on the amount of dark stain on the apple. A rating of 6 indicates a perfectly ripe apple. Note: This test works well at any time of year with bananas, which are commonly available at varying stages of ripeness.

Apple growers commonly use the following rating system:

- 1 = all blue-black (full starch)
- 2 = all blue-black except in seed cavity and halfway to vascular area (oval area around core)
- 3 = all blue-black except in seed cavity and vascular area
- 4 = half blue-black
- 5 = blue-black just under skin
- 6 = no blue-black (free of starch)

Lesson Plan modified from agclassroom.org[4]

4 https://agclassroom.org/matrix/lesson/print/538/

KANSAS SCIENCE STANDARDS ADDRESSED

MS-LS1-4 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

MS-LS1-4.

Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

Clarification Statement:
Examples of behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding. Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds, and creating conditions for seed germination and growth. Examples of plant structures could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury.

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education.

Science and Engineering Practices

Engaging in Argument from Evidence
Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).

- Use an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.

Disciplinary Core Ideas

LS1.B: Growth and Development of Organisms

- Animals engage in characteristic behaviors that increase the odds of reproduction.
- Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction.

Crosscutting Concepts

Cause and Effect

- Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.

Companion Texts for this study:
Apples to Oregon by Deborah Hopkinson

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