



Kansas Foundation
for **AGRICULTURE**
IN THE CLASSROOM

9-12

Teacher Toolkit



Welcome

We are here to help you weave agriculture into your everyday teaching with ready-to-use resources. Our goal is to make agricultural connections feel natural and meaningful, giving you simple ways to enrich core subjects with real-world relevance.

Why use agriculture to teach core learning?

Using agriculture to teach core subjects enhances student learning by making lessons more engaging, practical, and relevant. By connecting academic concepts to real-world applications, students gain hands-on experiences that reinforce key skills. Agriculture naturally integrates multiple disciplines—improving literacy through writing about food systems, enriching social studies through global food security discussions, and deepening science and math understanding through environmental data and problem-solving. This interdisciplinary approach fosters critical thinking, collaboration, and creativity.

Agriculture is also a cornerstone of our economy and community—especially in Kansas, where one in every eight jobs is tied to the agricultural industry. Farming and ranching contribute billions of dollars to the state's economy and are vital to sustaining rural communities. From the food we eat and the clothes we wear to the fuel that powers our lives, agriculture plays a role in nearly every aspect of daily life. That makes it not only a powerful teaching tool, but also a gateway to understanding essential systems and exploring meaningful career paths.



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Where Do I Start?

Get connected with Kansas Foundation for Agriculture in the Classroom!



Follow us on Facebook to get information on our resources, scholarships, grants and events.

<https://www.facebook.com/ksagclassroom>

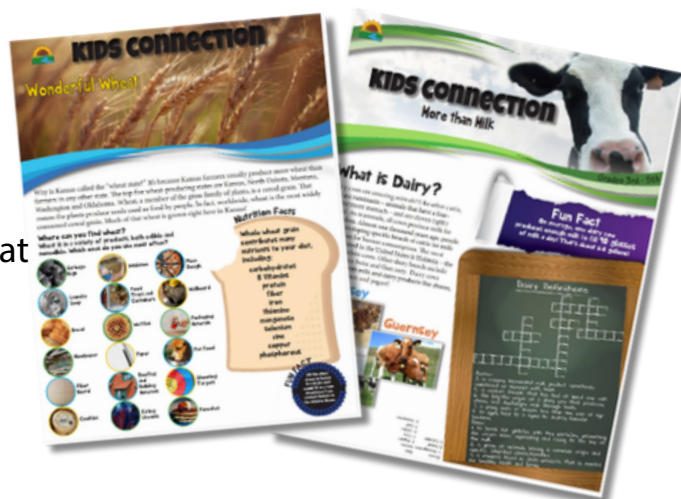
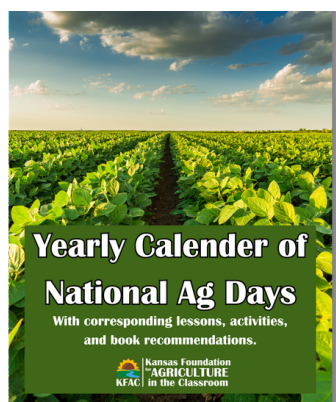


Get Connected

Subscribe to the monthly Kansas Foundation for Ag in the Classroom newsletter to receive program updates, classroom grant opportunities, lesson ideas and so much more!

Kansas Kids Connection Magazines

Kansas Kids Connection magazines are free resources that supplement KFAC's Educator's Guides with additional activities and information about Kansas agriculture.

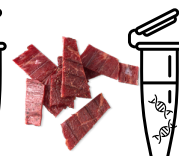
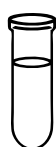
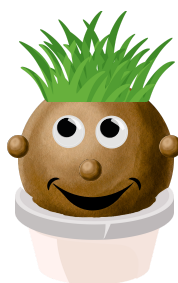


Ag Days Calendar

There is a national day for almost everything agriculture related, from popcorn to pizza to pollinators. Our calendar pairs these days with K-12 lessons and activities, making it easy to bring agriculture into your classroom in a fun and meaningful way.

Lesson Plan Kits

Our classroom kits are hands-on, grade-specific, and connected to state standards, linking core classroom topics to agriculture in a meaningful way. Follow us on Facebook to order a complete kit during our March or August release windows. Prefer to get started sooner? All of our kit lessons and supply lists are available to download for free on our website so you can do the activity any time of year.



I'm Warming Up

Continue building your KFAC involvement by growing your toolkit with these opportunities.



Resource Posters

Kansas Foundation for Agriculture in the Classroom provides a wide range of resources, including lesson plans, activities, and multimedia materials, to help educators incorporate agriculture into their teaching. These resources support hands-on learning, enhance student engagement, and connect agricultural concepts to various academic subjects.



Lesson Plans

Kansas Foundation for Agriculture in the Classroom offers a variety of standards-aligned lesson plans that integrate agricultural concepts into core subjects. These lessons are designed to be engaging and hands-on, helping students connect real-world agricultural topics to their learning while promoting critical thinking and problem-solving skills.



Scholarships

Thanks to the support of our generous partners, we are excited to be able to offer scholarships for K-12 educators to attend the National Agriculture in the Classroom Summer Conference. This conference is an experience like no other, and we want as many Kansas educators as possible to have the opportunity to attend! Apply today for a chance to experience agriculture in another state, attend educational sessions, and network with other teachers across the nation incorporating agriculture into their classrooms.



Mini Grants

Start off your next school year right with a mini-grant from Kansas Foundation for Agriculture in the Classroom. Use this grant to purchase the resources necessary to execute agriculture-based lesson plans in your classroom. Winning classrooms will be featured on the Kansas Foundation for Agriculture in the Classroom website and on social media.

Getting Started

Check out these free resources for
9th - 12th grade!

Create DNA on Your Plate!

Materials needed:

Per group	Per class
• Paper filter	• Beef Jerky
• 2 Pipettes	• Salt
• Centrifuge tube/person	• Meat Tenderizer
• 2 Condiment containers	• 80% Alcohol
• Marker	• Soap
	• Blender

Instructions

Day 1

1. Conduct Preparatory Activities on Food Science and Careers.
2. Place the beef jerky, water, and salt in a container to soak.
3. Share or review background information as time allows.

Day 2

1. Share or review background information.
2. Conduct engagement exercises.
3. Follow the procedures to conduct the lab exercise.
4. Complete the lab journal entry.

Find the full lesson at ksagclassroom.org

Kansas Foundation for AGRICULTURE IN THE CLASSROOM

Free Lesson Plans and Kits!

Follow us on Facebook to order a complete kit during our March or August release windows! Prefer to get started right away? You can also create your own using our easy-to-follow Make Your Own Kit—fun, flexible, and perfect for any time of year!

DNA on Your Plate

DNA on Your Plate offers students a hands-on opportunity to extract DNA from beef jerky, providing an engaging way to explore genetics and biotechnology. This lesson plan is associated with our free DNA on Your Plate kits, which provide all of the necessary materials for a class of 25.



For more free resources
visit ksagclassroom.org

DNA on Your Plate

Suggested Grade Level: 9-12

Time: Length of time for preparation: 15-30 minutes. Soak beef jerky for 8-12 hours before use.

Length of time for classroom teaching: 2 sessions of 45-60 minutes.

Subject: science, agriculture, food science, writing.

Overview: This lab will help students better understand DNA's structure, function, and importance within all living organisms and will help them develop laboratory design skills.

Students will explore the importance of DNA and beef products in their everyday lives by extracting DNA from beef jerky. The DNA extraction will help them visualize the DNA

Students will walk away with a new understanding of DNA's role in the nucleus and the cell. Students will visualize DNA in food allows them to understand the process of genetic modification. By exploring the impact of beef biotechnology.

To determine if cells in beef jerky

investigation on DNA extraction

ted during an investigation to (Laboratory activity/Post Lab) they have influenced

logy, on the Kansas economy]

(A) is the basis of all living things. happens in a cell. The cell is embedded in and on the



Diving Deeper

Check out these free resources for
9th - 12th grade!

How will we sustainably feed
nearly 10 billion people by 2050?



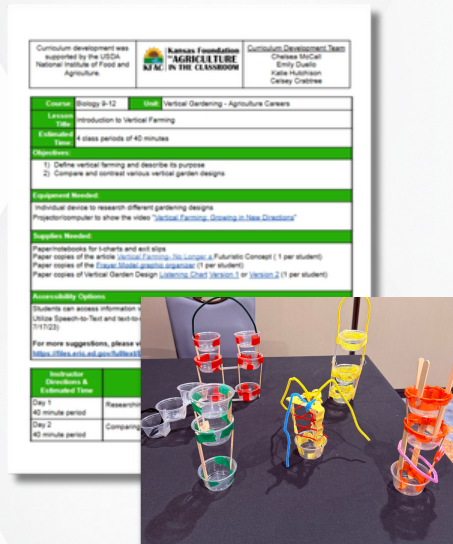
Journey 2050 is an immersive game that challenges students to think like global decision-makers. As they manage a virtual farm, students explore how to sustainably feed nearly 10 billion people by the year 2050. Through real-world scenarios, they learn how agricultural choices impact the environment, economy, and society—and why sustainability is key to our future. Each level of the gam has an accompanying PowerPoint and lesson and the teacher can see each student's progress through the back end of the game.

Learn more at journey2050.com.



Diving Deeper

Check out these free resources for
K - 2nd grade!

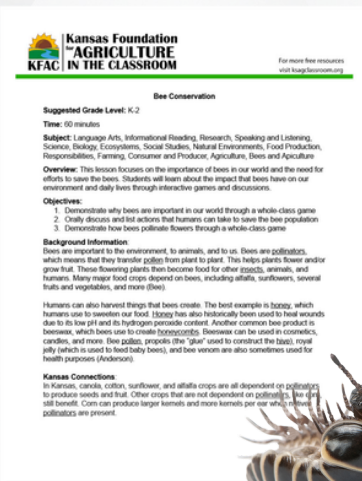
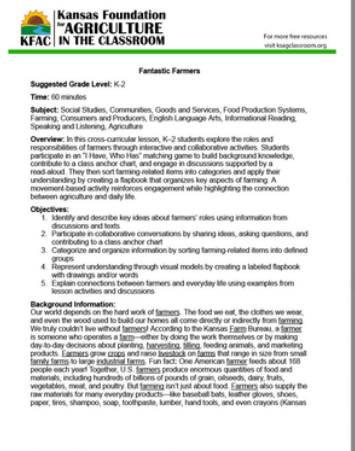


Vertical Gardening

This unit features 11 hands-on lessons that guide students through building and maintaining vertical gardens right in their classroom. It includes an online learning platform with podcasts, activities, and supplemental resources; a 3D virtual tour of the aeroponics system; career exploration cards; and more.

DIY Cooperative

Students learn about the origins and modern role of cooperative businesses, examine key milestones like the Rochdale Pioneers and major legislation, create a cooperative in groups, and finish by researching Kansas cooperatives. The lesson supports history, business, economics, career development, and strengthens presentation skills.



Soil Biodiversity Experiment

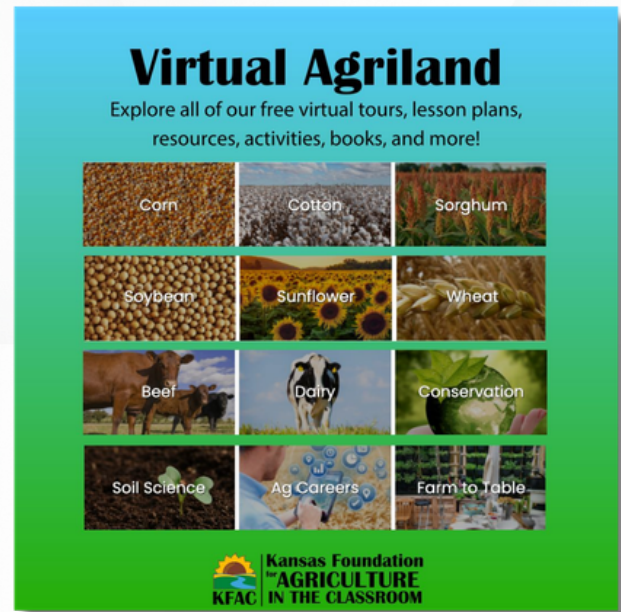
Introduce K-2 students to the importance of bees as pollinators. Through quick, engaging games and discussions, students learn how bees help our environment and what people can do to protect them. This lesson connects ELA, science, and social studies.

Keep Exploring

Check out these free resources for
K - 2nd grade!

Explore Virtual Agriland!

KFAC's Virtual Agriland is an engaging online resource that introduces students to agriculture through interactive lessons, virtual tours, and hands-on activities. Find resources for K - 2nd grade by clicking the link above!



Check Out Our Interactive Map!

The Interactive Map provides county-level access to local statistics, educational resources, and directories of agricultural businesses. Each county is clickable, allowing users to explore local data and connect directly with their community. To view the map, visit the link above.



Take It Further

Check out these free resources for
K - 2nd grade!



Edible Soil Profile

Overview:
Students will create an edible soil profile and study how soils are formed.

Procedure:

1. Have students wash their hands.
2. Give each student one cup.
3. Have each student layer the ingredients in the cup, allowing them to have different amounts of each ingredient to demonstrate how soil layers differ. Ideally, students would layer the following:
 - Vanilla wafers: 2
 - Marshmallows: 1-1/2 cups
 - Trusted oats: 1-1/2 cups
 - Chocolate puffs: 2 tablespoons
 - M&M's: 1-2 tablespoons
 - Gummy worms: 2
4. Hand out worksheets.
5. Discuss the layers of a soil profile, particle size, and how soils are formed while students enjoy their Edible Soil Profile.

Discussion Questions:
Ask students to print out the layers in their cup. What would happen if a layer would disappear. Compare weathering with eating the edible profile. What are some ways we can prevent the desertization, or desertification?

Targeted Grade Level:
K-2, 3-5

Time:
5-10 minutes

Materials:
6 serving bowls
Clear plastic 4-oz. cups, 1 per student
2 1/4 measuring cups
2 tablespoons
2 serving tongs
Vanilla wafers cookies
M&M's candy-coated
Trusted oats cereal
Chocolate puffs cereal
M&M's
Gummy worms
Labels for each serving container (see backlink, parent material, student, signed, original material, development)
Soil Layers worksheets, 1 per student

Football Bracelet

Overview:
Students will explore the connection between agriculture and football by identifying how common farm products contribute to the foods, clothing, and equipment found at a football game. Through guided discussions and creative bracelet making, students will learn how crops and livestock in Kansas play a role in a popular game day experience.

Procedure:

1. Ask the youth, "What are some examples of crops and livestock raised in Kansas?" Continue by asking the youth if they enjoy football. Share that the game of football could not exist without agriculture. Ask students, "What objects on football are made from items that come from a farm?" Explain to students that they will be making a football bracelet to learn more about objects and foods at a football game that are made with items that are grown or raised on a farm.
2. Have each youth take a pipe cleaner. Explain that they will be gluing one bead of each color onto the pipe cleaner. Below is what each bead represents in football and agriculture.

a) Football Bead: Bead
1. Each bead can be used to make the football in the game.

b) Purple Bead: Cotton
1. Cotton is used to make the players' jerseys and is glued to the team's colors.

c) Brown Bead: Wheat
1. Wheat is used to make the food for your favorite game day burger or hot dog.

d) Wheat Bead: Dairy
1. Dairy cattle produce the milk needed to make ice cream and make cheese.

e) Yellow Bead: Corn
1. Yellow corn is used to make the football in the game.

Go Further:
Read the Kansas Kids Connection Magazine for Beef, Cotton, Wheat, Dairy, and Corn.

Full Lesson:
<https://www.kansasagriculture.org/kansas-kids-connection-plant-football-bracelet>

Targeted Grade Level:
K-2, 3-5

Time:
10-15 minutes

Materials:
1 pipe cleaner
1 football bead
1 small purple pony bead
1 small brown pony bead
1 small white pony bead
1 small pink pony bead
1 small green pony bead

Ag to Go

Fun, Simple, on-the-go activities



Farming in a Glove

Overview:
Students will make their own seed germination necklace in the glove. They are able to watch their seeds germinate and grow.

Procedure:

1. Have the students look at their group's manifest Food, Plant, and Seed Cards. Ask the students to imagine that they are farmers that want to grow one of these crops. Ask, "How would you begin the growing process?" (plant the seeds).
2. Ask the students, "What do farmers need to provide in order to help the seeds grow into the plants that provide humans and animals with food?" (water, air, and sunlight). Discuss the germinating seed sprouts, the new plant will also need nutrients and light.
3. Tell the students that they are going to provide their seeds with everything they need to germinate. Germination is a scientific word for sprout. Explain that they will be germinating seeds in a very small form - in a glove.
4. Write the kid name on the palm of the glove and the type of seed in each finger.
5. Wet the cotton balls and place one in each finger of the glove.
6. Place a seed in each finger of the glove.
7. Seal the glove with a piece of tape on the back and hang with a pipe cleaner.
8. Keep glove in a warm, dark place.
9. Check glove daily. Germination will occur after 5-7 days.

Go Further:
Read the Kansas Kids Connection Magazine for Wheat, Soybeans, Sunflowers, and Corn.

Full Lesson:
N/A

Targeted Grade Level:
K-2, 3-5

Time:
5-10 minutes

Materials:
Food Service Gloves
Cotton Balls
Pipe Cleaners
Wheat
Soybeans
Sunflowers
Sunflower Seeds
Corn

Careers That Count

Overview:
Students will become familiar with many agriculture-related careers and the impact agriculture has on U.S. populations. In researching and going a little about chosen careers, students will learn how important agriculture-related careers are.

Procedure:

1. Distribute the Chart to students and have them complete "Y" and "W" of the chart regarding careers in agriculture.
2. Split students up into groups of 3 and instruct students to pick an agriculture career from the USDA Living Science Food, Agriculture and Natural Resources Career cards (https://www.aphis.usda.gov/aphis/npce/pubs/USDA_Careers).
3. Students will create from newspaper and duct tape strips that represent the career they have researched. Example: He/she will be an agriculture scientist or an agriculture economist or an agriculture teacher or a soil scientist and a student for a soil scientist.
4. Students will present the item and the rest of the group will try to guess what profession they chose. Students will then share the facts about that agriculture career.
5. Students will answer conclusion questions and complete the "C" on their K&S Charts.

Conclusion Questions:

1. Why is agriculture important to our nation?
People involved in agricultural careers feed, clothe, and provide other items for the nation's population.
2. How might your school work prepare you for a career in agriculture?
Answers will vary.
3. What are two careers in agriculture that you find interesting?
Explain after.
Answers will vary from students to students.
4. If you were to pursue a career in agriculture, what would it be?
Answers will vary from students to students.
5. What surprised you the most about this topic?
Answers will vary from students to students.

Go Further:
The Student Handbook, K&S Chart and Student Handbook C.
Presentation Game Board may be used as assessment tool.

Full Lesson:
<https://www.kansasagriculture.org/kansas-kids-connection-careers/>

Targeted Grade Level:
K-2, 3-5, 6-8, 9-12

Time:
10-20 minutes

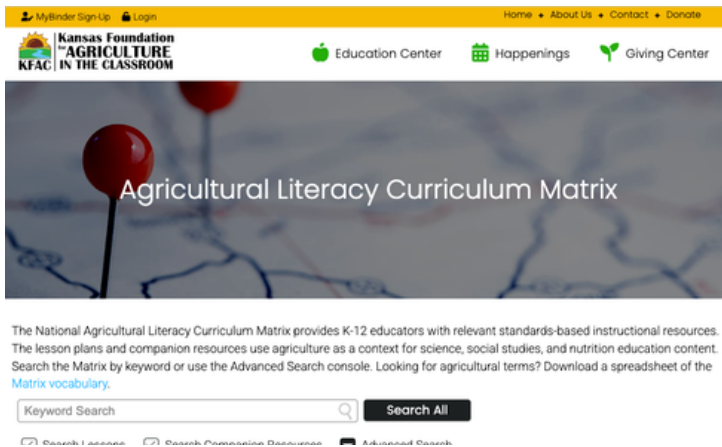
Materials:
Newspaper
Duct tape
USDA Living Science Career Cards
Copies of K&S Chart

Ag to Go: Fun, Simple, On-The-Go Activities

The Ag to Go Guide is a simple, ready-to-use resource that makes it easy to teach agriculture anywhere, anytime. Its short, hands-on activity bites are perfect for high school students who want to lead lessons in elementary schools, giving them a practical way to build confidence, leadership skills, and agricultural literacy while teaching younger learners. Click the link above to check it out!

I'm All In

Bring agriculture into your classroom with exciting materials, training opportunities, and events!



Instructional Materials

Engage students in activities that align to standards and explore teaching themes such as inquiry-based learning, and three-dimensional learning. Use the Curriculum Matrix to find lessons on specific topics and themes for your classroom.



Professional Development

Kansas Foundation for Agriculture in the Classroom (KFAC) provides professional development for educators through workshops, training, and resources that integrate agriculture into the curriculum. KFAC helps teachers create engaging, real-world learning experiences, fostering a deeper understanding of agriculture's role in society.



National Agriculture in the Classroom Conference

Join educators from across the nation to learn how to use agricultural concepts to teach reading, writing, math, science, social studies and more at the annual national convention. Explore agriculture across the country as the conference has a new location each year.

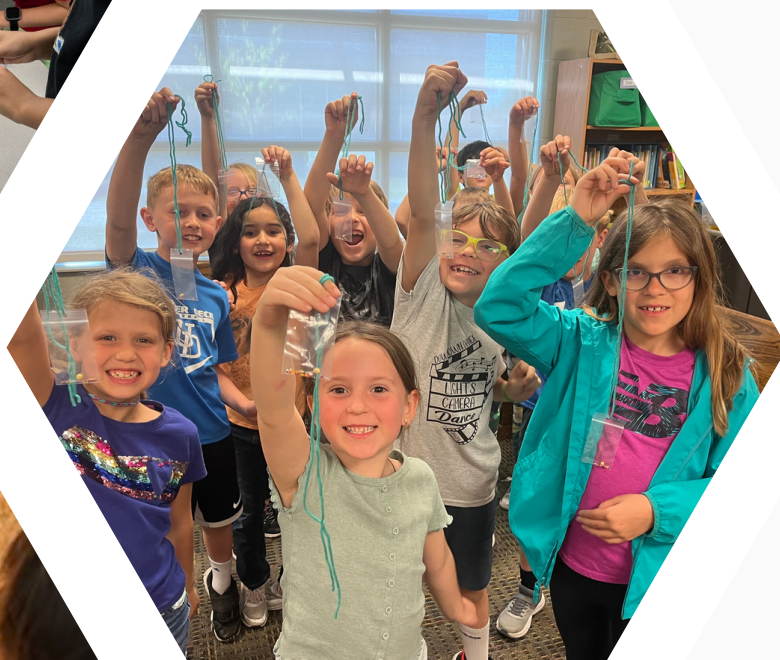




Kansas Foundation for **AGRICULTURE** **IN THE CLASSROOM**

National Agriculture in the Classroom (NAITC) aims to improve agricultural literacy by providing educators with resources, lesson plans, and professional development opportunities to incorporate agriculture into their classrooms. Our mission is to connect students to agriculture, helping them understand its impact on their lives and the world. Find more resources at <https://agclassroom.org/>.

Kansas Foundation for Agriculture in the Classroom (KFAC) is the state-level affiliate of NAITC. KFAC provides tailored resources, lesson plans, and professional development opportunities to help teachers integrate agricultural topics into their curriculum. By fostering a deeper understanding of agriculture's role in society, KFAC aims to engage students in hands-on learning and promote agricultural literacy across Kansas.





Kansas Foundation for **AGRICULTURE** in the Classroom

About Us

KFAC is a statewide, self-funded 501(c)3 nonprofit agricultural literacy program providing educational resources, training, and support for schools, educators, and volunteers to spark meaningful connections between classrooms and Kansas agriculture.

Kansas Foundation for Agriculture in the Classroom...

- Provides educators with agricultural lesson plans and resources.
- Offers professional development opportunities for teachers.
- Promotes agricultural literacy through hands-on learning experiences for students.

Every year, KFAC reaches...

160,000+
Students



5,500+
Teachers



Connect with us:

Phone: 785-320-4350

Email: info@ksagclassroom.org

Website: <https://www.ksagclassroom.org/>



® Kansas Foundation for Agriculture in the Classroom

