KANSAS CORN STEM

Kansas Corn:
A Kernel's Adventure

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KANSAS CORN COMMISSION

Kansas Corn: A Kernel's Adventure

Grade Level: 1st

Lesson 1: Why is corn important to me? (30 minutes)

Key Question

- Why do we need farmers to grow corn?

Learning Objectives

- The children will propose an answer to the question, "why do we need farmers to grow corn?"
- The children will provide evidence that many everyday products are made from corn.

Materials

- Book: "We Grow Corn: Seasons on a Kansas Family Farm"
- A variety of products made with corn (page S1-2)
- Pictures of "No Corn"/ pictures of "Corn" (page S3-4)

Note: If a product cannot be found in the store or you do not have it at home, photos of all corn-derived products listed in this unit can be found with the electronic version of this guide at www.kansascornstem.com

Guided Teaching

Guided Questions

Introduce the topic and assess your child's prior knowledge with the following questions:

- "Who knows what corn is?"
- "How would you describe corn?"
- "Where do we find corn?"
- "How do you know it's corn?"
- "Why do farmers grow corn?"

Read Aloud

Read the book, We Grow Corn: Seasons on a Kansas Family Farm. If you read this book when you taught Unit 1, then you can just review the pages as you go through the book.

- Make sure to go over the vocabulary.

Discussion

Discuss that corn grows in Kansas and it is all around them.

- "Do you know what products corn is used to make?" (Let your child discuss without cueing them as to whether they are right or wrong. Ask them how they could find out, how they could find evidence).

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Game

Play a game with the products that contain corn. (As mentioned above you can use the products listed on page S1-2 or you can use the online pictures.)

- Set up 2 places in your home with the pictures of "no corn" and "corn", these will be used as stations. You will show your child one product at a time and ask if they think it contains corn. If no, your child will go to the "no corn" sign. If yes, they should go to the "corn" sign.
- Go through all the products that you have.

Reveal the answers and discuss

After you have gone through all the products, discuss that all the products you talked about contain corn! Use the following prompts:

- "Can you find the word 'corn' on the list of ingredients?"
- "Are you surprised that so many of our everyday products use corn?"
- "What do you think about so many products containing corn?"
- "Is it important that our farmers grow corn? Why?"
- "What do you think would happen if farmers could not grow corn?"

Conclusion

- "You discovered how important corn is to our lives and that Kansas farmers grow corn. We will continue to learn more about corn. Until then, be on the lookout for corn in your world! Is it in the products you use? Is it growing in a nearby field?"

Early Elementary Activity

Science Activity

- Take some time to look through other products that are in your kitchen. Reading the label, look for the word corn, cornstarch or corn syrup. Can you find more products that are made of corn?

Writing Activity

- Think back to the game we played where you had to decide if the product had corn in it or not. Write about one of the products and if you guessed correctly. Why was it easy or not easy to guess the correct answer? Write a couple of sentences about how the game went.

Upper Elementary Activity

Science Activity

- Take some time to look through other products that are in your kitchen, bathroom and even in the

garage. Reading the labels, look for the word corn, cornstarch or corn syrup. Can you find more products that are made of corn?

- Hand out the "Could it be Corn" Mystery of Corn reader to learn more about how corn is used.

Writing Activity

- Think back to the game we played where you had to decide if the product had corn in it or not. Write about your experience during this game. What products were easy to figure out they had corn in them? What products surprised you that had corn? Encourage your child to write between 3-5 sentences about their experience.
- Hand out the "Could it be Corn" Mystery of Corn reader to learn more about how corn is used.

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Lesson 2: Where is the Corn Seed? (30-40 minutes, with follow-up observations and 15-20 minute discussion in 7-10 days)

Key Question

- How does corn grow?

Learning Objectives

- The children will propose an answer to the question, "Where is the seed in a corn plant?" for further exploration.
- The children will make observations of their planting to construct an evidence-based account that corn kernels are corn seeds.

Materials

- Complete full grown corn stalks with at least one ear on each (best done in the fall, reach out to a farmer to get a corn plant)
- Planting containers
- Soil
- Growth Chart (page S5)
- Construction paper
- Spray bottle
- How Does Corn Grow? sequence sheet (page S6)

Guided Teaching

Introduction

Introduce the topic and activate prior knowledge. Review the importance of corn discovered in the previous lesson and introduce the question of how it grows:

- "What products did we discover are made from corn?"
- "Did you discover any other products made from corn?"
- "Is it important that our farmers grow corn? Why?"
- "How do farmers grow corn? What do they need to do?"

Exploration

- Discuss the following question:
  - "How do new corn plants grow?"

- "How would a new plant start?"
- Pull out the complete corn stalk (it is recommended to do this activity outside).
- Take time to look over the whole corn stalk.
- Can any of the parts of the plant be named?
- Guide your child to think about seeds and the role that seeds play in growing new corn plants.
  - Ask your child to find the seeds in this corn stalk.
  - Then ask, "Do you think other parts of this plant would be able to grow corn?"
  - "How can we test what is a seed and what is not a seed?"

Planting

- You will be planting all the parts of the plant.
- Distribute planting containers with soil and have children plant the different parts of the corn stalk. Example: One container will have some husks, while another container will plant some silk. Ideas on what can be planted: a bit of the stalk, part of the root, some of the tassel, part of the husk, some of the leaves and some of the silk.
- Make sure at least one container has a kernel that is planted.
- Be sure to label the container with what was planted.
- Water the containers with a spray bottle.
- Put all the plants in an area to receive sunlight.

Note: Optimum planting depth of the corn kernel is 1-2 inches deep. It will take approximately 5-7 days for a shoot to be seen from the kernel.

Other parts of the corn plant can be planted 1-2 inches deep as well.

Observe

- Observe and record results over 5-10 days:
  - Have your child water the soil of all the planting containers so they stay damp with the spray bottles over the next 5-10 days.
  - Have your child observe and record which plantings sprouted new corn plants and which did not.
  - Have your child use the growth chart or journal to record the growth of their "seed" (page S5).

Analyze

- Analyze findings and discuss after 7-10 days (15-20 minutes).
- Draw your child's attention to the planting containers.
- Discuss with the following or similar prompts:
  - "What parts of the corn plant were able to sprout new corn plants? The leaves? Tassels? Roots? Kernels?"

- "How do you know?"
- "What does this tell you about where the seeds are in the corn plant?"
- "If you wanted to plant corn plants, what part of the plant would you plant?"
- "What are the seeds?"
- "What does a farmer plant in her/his field in order to grow corn?"

Conclusion

Prompt children to explain how they know the corn kernel is a seed, based on their first-hand observation (evidence). Have children complete the "How Does Corn Grow?" sequence worksheet to assess understanding of the corn life cycle.

Early Elementary Activity

Art/Science/Writing Activity

- Document their thinking: Distribute construction paper and have your child draw a picture of a corn stalk and circle where they found their proposed "seed". This paper can be placed under their planting container or kept somewhere close to refer to as a reference. A picture can be drawn for each planting container. If your child can, have them label the parts of the corn stalk in their drawing.
- For the next 5-7 days, have your child write or draw their observations under the picture of their "seed". Encourage your child to write a sentence about their observations. Do not forget to date it!

Writing Activity

- Write a friendly letter to Farmer Bill and let him know what you found out from your seed experiment. Which "seed" grew into a corn plant? A friendly letter contains the date, "Dear" and ends with "Sincerely". Mail letters to: Kansas Corn STEM, 110 W. 4th Ave. P.O. Box 446, Garnett, KS 66032

Upper Elementary Activity

Art/Science/Writing Activity

- Document their thinking: Distribute construction paper and have your child draw a picture of a corn stalk and circle where they found their proposed "seed". This paper can be placed under their planting container or kept somewhere close to refer to as a reference. A picture can be drawn for each planting container. Make sure to label the parts of the corn stalk in the drawing.
- For the next 5-7 days, have your child write or draw their observations under the picture of their "seed". Encourage your child to write a couple of sentences about their observations. Do not forget to date it!

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Writing Activity

- Write a friendly letter to Farmer Bill and let him know what you found out from your seed experiment. Which "seed" grew into a corn plant? Also, write to Bill about what corn needs to grow, soil, sun, water ect. Farmer Bill would love to hear about everything you learned from this activity. A friendly letter contains the date, "Dear" and ends with" Sincerely". Mail letters to: Kansas Corn STEM, 110 W. 4th Ave. P.O. Box 446, Garnett, KS 66032

Common Items Containing Corn

Toothpaste: Sorbitol is an ingredient in toothpaste derived from corn. It helps create toothpaste's flavoring and texture.

Yogurt: Uses high-fructose corn syrup as a sweetener; the cows that make the milk also eat corn in their daily meals.

Gum: Uses high fructose corn syrup and maltitol as sweeteners and sorbitol for flavoring.

Cosmetics: Blush and eye shadow often contain zea mays, which is another name for corn.

Shampoo: Citric acid is a common ingredient in shampoos and conditioners and is derived from corn.

Diapers: Corn starch is used to soak up moisture in diapers.

Envelopes: Corn is used to make nitrocellulose glue, which holds envelopes closed so they can be mailed.

Corn Bread: The main ingredient is corn meal, which gives corn bread its gritty texture compared to other types of bread.

Handsoap: For many different purposes, at least 25% of the ingredients in some hand soaps contain or were derived from corn.

Windex: This glass cleaner contains at least 5 different ingredients derived from corn.

Jellybeans and Licorice: These candies not only include corn syrup of some form to give them their texture but also, powdered corn starch is used to coat their molds and allows manufacturers to more easily pop them out after they're finished being molded.

Corn Flakes: If you are somone who enjoys a hearty bowl of flakes for breakfast, you're eating the corn grit that has been steamed and flaked.

Paper, Recycled Paper and Cardboard: Industrial corn starch is used during the paper-making process.

Crayons and Chalk: Utilize industrial corn starch to get them out of their molds and corn products also help the paper labels adhere to the crayons.

Running Shoes- Currently, most shoes are made with oil-based plastics, but Reebok has announced that it will begin to make the sole of their new sustainable shoe with petroleum-free, non-toxic, industrial-grown corn.

Spark Plugs: Spark plugs in your car are made from metal and ceramics. When the crystalline structures of cornstarch are heated to very high temperatures, they harden and it becomes a type of ceramic. The ceramic is able to withstand high temperatures and also withstands the corrosive properties of some specific acids.

Rubber Tires: Instead of using oil-based rubber, Goodyear and their research partner Genencor are using cornstarch to chemically bind the ingredients of its new kind of tire.

Fireworks: Some of the compounds in fireworks require a "binder" in order to burn properly. A common binder is dextrin, a light carbohydrate most commonly made from corn.

Popcorn: Popcorn is its own type of corn. There are three common types of corn; sweet corn, popcorn and field corn. The two we eat in their natural form are sweet corn and popcorn.

Pet Food: Pet food is regulated to the same level of safety as human food. Corn is used in pet food to create a balanced diet for all kinds of pets including dogs, cats and even fish.

Batteries: Corn starch is often used as an electrical conductor in batteries.

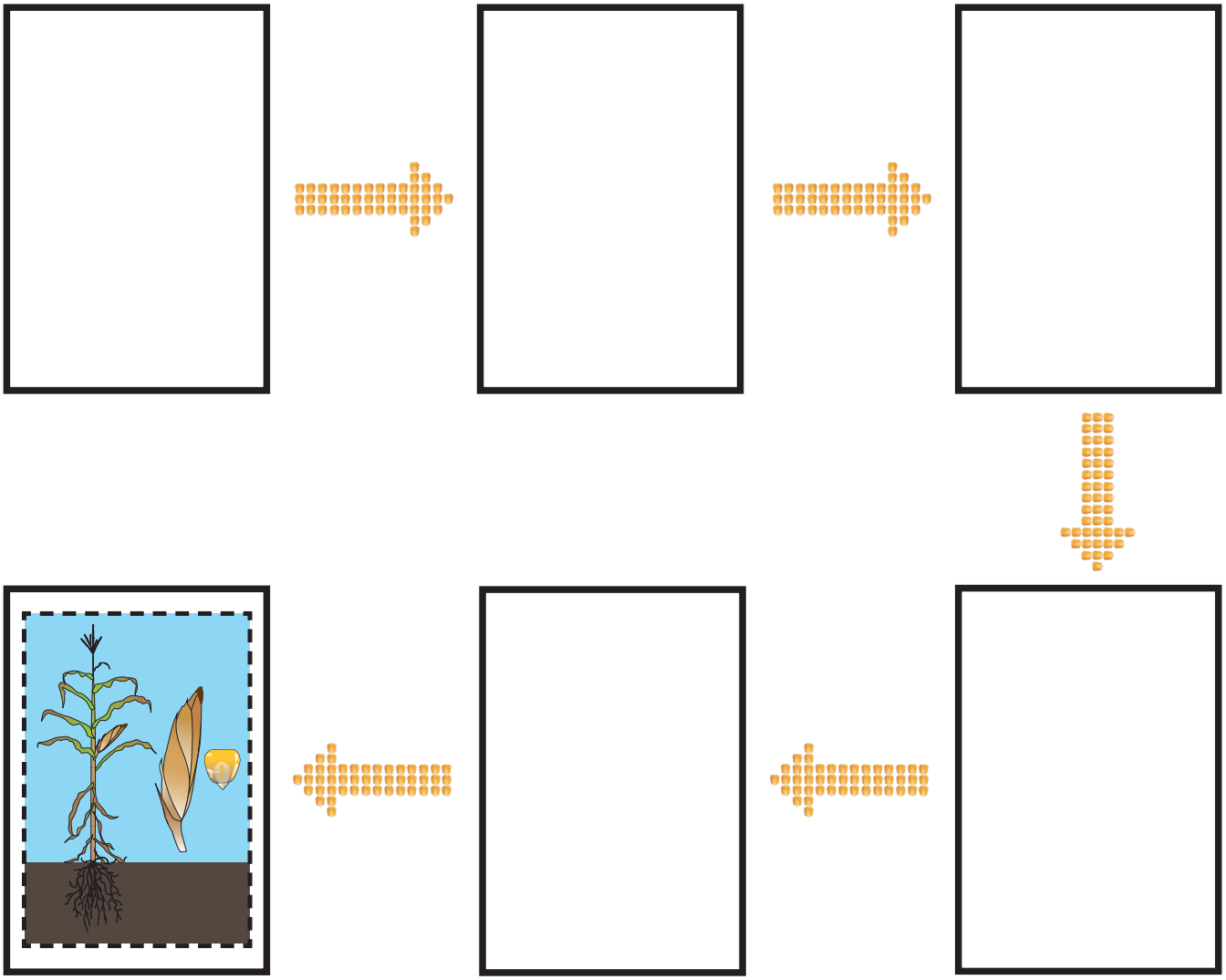
Deodorant: Uses corn starch because of its absorbent nature.

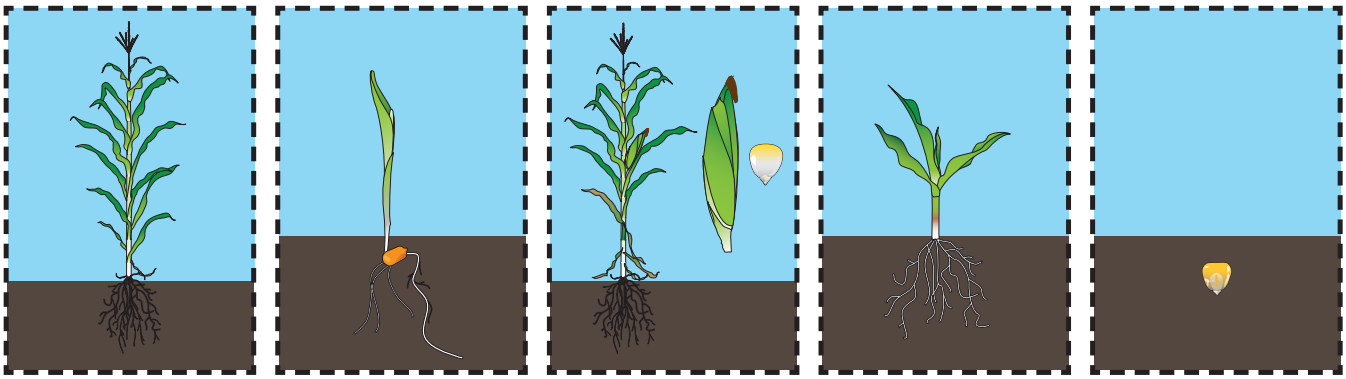
Hand Sanitizer: Contains ethanol which typically is made by fermenting corn.

Carpet and Other Textile Products: Corn-based textile products are often preferred to the petroleum based products because they are more environmentally friendly.

Plastic Products: While it's not a widespread use like the other products, bioplastic is being used in many different products such as bags, containers and cups. Corn-based plastics are biodegradable and use up to 68% less fossil fuels during production than traditional plastics and are estimated to emit 55% less greenhouse gases.

Cut out the pieces at the bottom and paste them in order of how the corn plant grows.





How Does Corn Grow?

Cut out the pieces at the bottom and paste them in order of how the corn plant grows.