SORGHUM at School

The SORGHUM story

An integrated curriculum for 3rd to 6th Grades

Lesson Overview

This lesson will introduce students to sorghum, a nutritious, gluten-free whole grain that can be enjoyed in many ways. Students will learn basic facts about sorghum, including the stages of plant growth, production in the United States, health benefits, geography and positive environmental impacts. The lesson also gives options for growing and tasting sorghum. At the end of the lesson, students will receive the Starring Sorghum handout take-home sheet, which includes recipes to share with their families.

Objectives

The students will:

1. Be introduced to sorghum and learn about its origins, usage, positive environmental impact and production in the United States.
2. Identify the basic parts of a sorghum plant and view the stages of growth from seed to harvest.
3. Recognize that sorghum is a nutrient-rich whole grain that provides energy for active, growing children and adolescents.
4. Learn from integrated participatory activities highlighting health, nutrition, geography and science through a mapping activity, a tasting activity and an optional growing activity.

Integrated Subjects

- **Nutrition** (MyPlate, grains/whole grains, energy and nutrients, gluten-free)
- **Health** (the relationship between healthy behaviors and personal health, setting and tracking a personal health goal)
- **Geography** (map skills)
- **Language Arts** (vocabulary, reading, writing, seeking information)
- **Science** (environmental impact, plant science)

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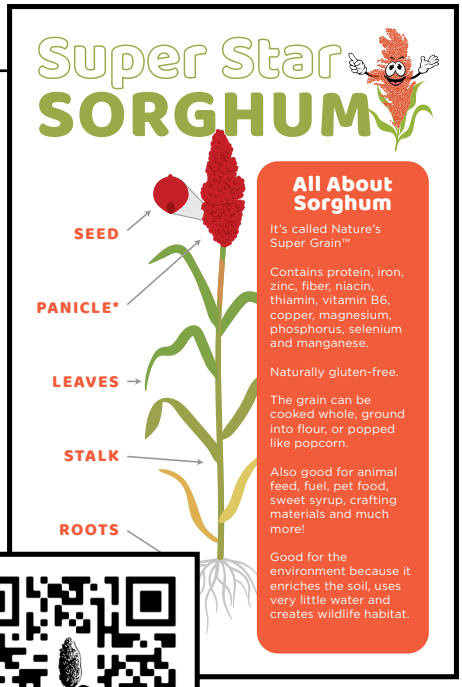
- United States and world maps
- Super Star Sorghum! poster
- Sorghum Growth and Development poster: instructions for obtaining hard copies should be located on the site at the QR code
- Reproducible activity sheets
    a) Learning About Sorghum student activity sheet (Version A, 3rd/4th grade)
    b) Learning About Sorghum student activity sheet (Version B, 5th/6th grade)
    c) Starring Sorghum family handout family take-home sheet
- Package of whole grain sorghum*



Scan the QR code for digital copies of all resources, or to request hard copies and samples.

Materials to Gather for Activities

You will need:

- **Tasting:**
  To make a sorghum parfait:
  - Cooked whole grain sorghum (if possible, ask foodservice director to supply)
  - Berries, pineapple chunks, banana slices or other cut fruit
  - Vanilla yogurt
  - Optional: cinnamon, pumpkin pie spice or other flavorings
  - Small cups and spoons

- **Planting:**
  - Whole grain sorghum
  - Potting soil
  - Small pots for planting with lids or tray
  - Tape for labeling pots

*Scan the QR code to request a sample. Larger quantities are available at grocery stores or online retailers. A standard 24-oz. package should be enough for a classroom of 20 children.

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Teaching the Lesson

1. **Review the Educator Resource Page, Super Star Sorghum! poster and Sorghum Growth and Development poster to become familiar with sorghum.**

2. **Introduce the lesson by displaying the posters and graphic of the MyPlate food guide. Lead a brief discussion with the students about sorghum.**
   a) Ask students whether they have heard of sorghum. Ask whether any of the students have eaten sorghum. Encourage students to share their experience seeing or eating sorghum. For students who are unfamiliar with sorghum, ask how likely they are to try this fun new food.
   b) Point out that sorghum will sometimes be served in the school cafeteria this year. Encourage students to choose sorghum dishes when they are served. If possible, coordinate with school foodservice personnel for this lesson to occur on a day that sorghum is served on the school breakfast or lunch menu.
   c) Ask the students if they have heard of a whole grain and if they can describe what that term means. Discuss that a whole grain is when the entire seed or grain is eaten (i.e. the "whole grain"). Refined grains have part of the seed removed (bran and germ) and do not provide as many nutrients as whole grains. Whole grain sorghum and whole grain sorghum flour are both examples of whole grains.
   d) Explain that sorghum is a healthful whole grain and ask whether they can identify its placement on the MyPlate food guide. Point out that grains provide energy to the body and whole grains, such as sorghum, provide nutrients including protein, fiber, vitamins and minerals to help bodies grow and stay healthy. The Super Star Sorghum! poster includes a list of some of the key nutrients found in sorghum.
   e) Sorghum is also a gluten-free grain. This is important for people with celiac disease, a condition where gluten from wheat, rye and barley damages the small intestine. Some people are also intolerant to gluten and find that a gluten-free diet helps them feel better.
   f) Display the Super Star Sorghum! poster and review the parts of the plant. Ask if they can identify the part of the plant that we eat (the grain). Pass around the package of whole grain sorghum so that they can see the grains. Show students the Sorghum Growth and Development poster and explain how it shows the stages of growth and advises farmers on how to manage sorghum during each stage. Students who complete version B of the activity sheet will utilize the Sorghum Growth and Development poster in a small group activity.

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3. **Introduce the geography/mapping activity.**
   a) Discuss how the United States is the world's leading producer of sorghum. Show students the U.S. map and ask them to identify the six states that grow the most sorghum – Kansas, Texas, Colorado, Oklahoma, South Dakota and Nebraska. Kansas is the leading producer, with over three million acres of sorghum.
   b) Sorghum is a staple food for 500 million people in 30 countries. Leading consumers of sorghum include India, China and several countries in Africa, including Sudan, Nigeria and Ethiopia. Ask students to help locate these areas on the world map.
   c) Ask students if they are familiar with the term "archeology" and define as needed. Explain that the first evidence of sorghum consumption was found at an archeological dig at Nabta Playa, near the Egyptian-Sudanese border. Based on their findings, archeologists determined that people were eating sorghum over 8,000 years ago! Ask students to locate Nabta Playa on the world map.

4. **Introduce and complete the sorghum parfait tasting activity.**
   a) Set out the cooked and cooled sorghum, fruit, yogurt, flavorings, cups and spoons on a clean table. Place a serving spoon or tong with each ingredient.
   b) Ask students to wash hands and then invite 3 to 5 students at a time to assemble their parfait, layering the sorghum, yogurt, fruit and flavorings in their cup.
   c) Ask students to describe the taste and texture of sorghum. Point out that sorghum has a neutral, nutty flavor, making it ideal to combine with both sweet and savory ingredients.
   d) Ask students to brainstorm other ways to enjoy sorghum. Point out that sorghum works well in many dishes as a substitute for other grains such as rice or barley.

5. **Introduce and complete the planting activity.**
   a) Whole grain sorghum is also a seed. For best results, soak whole grain sorghum overnight to soften the seed and speed the germination process.
   b) Ask students if they can explain what a plant needs to germinate and grow. Acknowledge their replies and briefly review that plants are alive and require soil, oxygen, light and water. Depending on student readiness level, explain the concepts of soil nutrients, oxygen from air, light/sun for photosynthesis and how living plants require water.
   c) Set up an area in the classroom with potting soil, a scoop or large spoon, small pots and tape for labeling.
   d) Work with students in small groups to fill their small pots with soil and ask them to pat the soil flat.

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e) Press 2 to 3 sorghum seeds one half inch deep in each pot and cover with soil. Ask students to predict what will happen to the planted seed. Introduce the concept of germination, which is how the seed changes and develops into a small plant known as a seedling.
f) Use the tape to make a label with each student's name and the date of planting.
g) Lightly water and place in a lid or tray to catch the water drips.
h) Place in a sunny window or under a grow light. Seedlings should emerge within 4 to 10 days.
i) Continue to water until just moist and monitor the progress of the plants by measuring height or counting stalks. Ask students to thin to one plant per container.
j) If it is the warm season, students can plant in their home or school garden.

6. **Pass out either version A or B of the Learning About Sorghum activity sheets and ask students to complete individually or in small groups.**

7. **Send home the Starring Sorghum family handout to each student.**

Going Further

1. Invite the school foodservice director to your classroom to discuss how sorghum is being used in the school foodservice program.

2. Encourage students to try sorghum at school or at home. Remind students to share the Super Sorghum! sheet with their family.

3. If students participated in the growing activity, continue to monitor the sorghum plants and use the Sorghum Growth and Development poster to recognize and track stages of growth. If it is the warm season, ask students to plant in a larger container or in their home or school gardens.

4. Brainstorm ways that students can include sorghum at breakfast, lunch, dinner or snack time. Discuss various dishes as possibilities for incorporating sorghum.

5. Show students the "Sorghum at School" video from the United Sorghum Checkoff Program. Scan the QR code below to access this and other resources.

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Education Standards

Science/Next Generation Science Standards (NGSS):

- Students who demonstrate understanding can:
    - 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
        - ESS3.C: Human Impacts on Earth Systems: Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.

National Health Education Standards (NHES):

- Performance expectations:
    - 3.5.7 Write about a health-related product that supports a health decision or health habit.
    - 6.5.1 Set a realistic personal health goal.

Kansas Standards for English Language Arts:

- W.3.2, W.4.2, W.5.2 (3rd, 4th, 5th grades)
  Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.6.2 (6th grade)
  Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

Sources:

1. Next Generation Science Standards, https://www.nextgenscience.org/
2. National Health Education Standards, https://www.schoolhealtheducation.org/wp-content/uploads/2022/10/National_Health_Education_Standards_Guide-10.02.2022.pdf
3. Kansas State Department of Education, Standards for English Language Arts, https://community.ksde.org/Default.aspx?tabid=5301