SC Farm Bureau Ag in the Classroom Post Office Box 754 Columbia, SC 29202

## June 2023 Monthly Book From Seed to Plant By Gail Gibbons Grade Levels: K-8 Google Slides: CLICK HERE <br>  <br> SCAN ME

## Book Summary:

- This book will help readers understand the process of how a little seed grows into a plant.


## Background Agricultural Connections:

Gardens in South Carolina

- South Carolina is home to many unique gardens, located all over the state. From the beautiful South Carolina Botanical Garden on the grounds of Clemson University to the majestic Swan Lake Iris Gardens in Sumter to the famously gorgeous Brookgreen Gardens in Murrells Inlet, discover why these South Carolina gardens are a must-see for anyone visiting the Palmetto State. ${ }^{2}$
- The animals held at the Riverbanks Zoo is not the only
 draw-their onsite botanical garden makes just as strong an impression. Included in zoo admission is a chance to wander the lush gardens and see what's growing. From the children's garden to the Asian garden to other sections with various themes, visitors will soon see why this botanical garden was named one of the top 20 Best Public Gardens in America on HGTV. ${ }^{3}$
Home Garden Planning ${ }^{4}$
- Home garden vegetables can be grown abundantly in most areas of South Carolina with proper care. Many who have grown vegetables for the excellent fresh flavor or as a hobby now find home gardening profitable with today's high food costs.
- The number of home vegetable gardeners is steadily increasing in the state. Success or failure of home vegetable production can depend on many things, but some major reasons for failure are negligence, not following the proper instructions, and not keeping up with current vegetable developments.


## South Carolina Planting Seasons ${ }^{5}$

- South Carolina offers an excellent garden environment with rich soil, warm temperatures, and abundant sunshine. To create a flourishing garden in this diverse climate, you should understand the region's unique growing conditions and select suitable plants. Let's explore how to make the most of South Carolina's weather and climate for a thriving garden. You should also consider the recommended planting zones, which can help determine what plants will best thrive in your area.
- South Carolina enjoys a pleasant climate with summertime temperatures ranging from $77^{\circ} \mathrm{F}$ to $93^{\circ} \mathrm{F}$. The wintertime lows range between $61^{\circ} \mathrm{F}$ to $72^{\circ} \mathrm{F}$. Its long growing season, featuring mild winters, makes it the perfect environment for plants that do not tolerate harsh cold weather.


## Gardening Tips ${ }^{5}$

- Timing - Plant cool-season crops, such as peas, in late winter or early spring and again in the fall for a second harvest. You should plant warm-season crops like tomatoes in the spring once the soil is warm and there is no longer a danger of frost.
- Soil preparation - Regardless of your region, soil preparation is essential for a thriving garden. Amend your soil with organic matter, such as compost, to improve fertility, drainage, and water retention. Perform a soil test to determine the pH and nutrient levels, making necessary adjustments. You may also need to add lime to raise the soil's pH . You should also rotate crops to ensure soil fertility and help prevent disease.
- Watering - South Carolina's climate often experiences periods of heavy rainfall followed by dry spells. Maintain consistent moisture levels by watering your garden deeply and less frequently, rather than shallow and frequent watering. Utilize mulch to conserve moisture and reduce evaporation.


## Book Discussion:

- Describe the process of harvesting pecans.
- Describe the relationship of the young girl and her grandpa.
- What is the theme of this book? Provide evidence to support your idea.


## Agricultural Vocabulary: ${ }^{1}$

- seeds - a flowering plant's unit of reproduction, capable of developing into another such plant.
- flowers - sometimes known as a bloom or blossom, is the reproductive structure found in flowering plants.
- petal - petals are modified leaves that surround the reproductive parts of flowers.
- pistil - the center of the flower
- stigma - the sticky part at the top of the pistil
- pollen - add minerals to the soil so plants grow better
- pollenation - when a grain of pollen from the stamen lands on the stigma at the top of the pistil
- stamens - the parts of the flower around the pistil
- stem - provide support for leaves, flowers, and fruit. Water, nutrients, and sugars travel to and from other parts of the plant through the stem. Asparagus is a stem that can be eaten. Potatoes, often mistakenly thought to be roots, are actually enlarged underground stems called tubers.
- sepal- a plant that is alive but not growing (often happens in winter)
- Ovuls - tiny egg cells
- Seed coat - protective wall on the outside of the seed
- fruits - is the part of the plant that contains seeds. This botanical definition includes many foods that are typically considered to be vegetables, such as cucumbers and green peppers, as well as more commonly recognized fruits, such as apples, oranges, bananas, and strawberries.
- Germination - when the sun shines and warms the group the seed coat breaks open and the seed begins to grow
- root - grows from the seed down into the soil to take up minerals and water from the soil


## Activities:

## (ALL GRADES)

## English Language Arts (ELA)

- Thank A Local Plant Nursery/Garden
- Many local plant nurseries or gardens work extremely hard to provide a variety of plants/trees/seeds and sometimes even fresh produce. Send a thank you note to them to show that you appreciate their hard work in helping promote plant growth and gardening in your local area.
- Graphing Activity ${ }^{5}$
- What is your favorite type of plant?
- Give students several different types of plants to pick from if they need assistance.
- Have them research local area plants and pick their favorite. Make sure that they can explain why it is their favorite.
- Make a bar graph to collect the data.
- Have students draw their favorite plant.
- Mini-Planting Growth Research Project
- Research your favorite fruit or vegetable and research when the best time to begin growing it would be. Also include why it is ideal. What conditions in South Carolina make it the perfect time to begin planting.
- Website: https://hgic.clemson.edu/factsheet/planning-a-garden/


## Science

## - Life Cycle Exploration ${ }^{6}$

- Have students create a poster of the life cycle of a seed! Use the slide to explain each part of the cycle.
- Website to explore the life cycle:
https://smartclass4kids.com/science/plants-facts/plant-life-cycle/
- Youtube videos: © Plant Life Cycle Stages From Seed To Fruit | Primary School Science Ani...



## - Magic School Bus Videos

- The Magic School Bus Gets Planted
- The Magic School Bus Goes to Seed
- Watch either of these videos and have a class discussion about what you have learned from watching.
- How does your garden Grow? ${ }^{7}$
- Materials Needed:
- Master 5.1., 1 copy per group
- Master 5.2, 2-4 copies
- Master 5.3, 1 copy per student
- Glue sticks
- Engage - Begin a discussion with the students about gardens. Use the following questions to guide the discussion:
- Raise your hand if your family grows a garden.
- What are your favorite foods that you have grown in your gardens?
- When do you usually plant your garden?
- When do you usually harvest the fruit and vegetables from your garden?
- Explore and Explain
- Preparation:
- Find out the last expected frost date in the spring and the first expected frost date in the fall for your area. A local garden center or Extension office should be able to easily give you this information. Alternatively, you can find this information online.
- Cut apart the plant cut-out pieces from Master 5.2. Create sets containing parts representing the various plants for each team of students. The height of each cut-out piece is scaled to represent the amount of row space that a plant requires. For example, cabbage plants should be spaced 16 inches ( 40.64 cm ) apart. The height of the cut-out is scaled so that it represents 16 inches $(40.64 \mathrm{~cm})$ of a row on Master 5.1. (The pieces are not scaled in the horizontal direction.) Students will place the cut-outs on the rows on Master 5.1 to show what they would plant in their gardens. Students can line up the shaded line on each cut-out piece with the line representing the row on Master 5.1. They can then glue these pieces down after they have made their decisions.


## Activity 1: Planning a Garden

1. Have the students list ideas about what they would need to know to help them plan a garden. Point out that they will need to know the last date that frost occurs in the spring in their area. Ask students why this is important. (The last expected frost data in an area is important because most plants won't tolerate cold temperatures or frost well. The young plants are likely to die if they are hit by frost. Also, it gives an indication of how many days are in the area's growing season.)
2. Explain to the students that you have found out the dates for both the last frost in the spring and the likely first frost of the fall. Write those dates on the board. Explain that you have used this information to figure out the number of days for the growing season in your area. Point out that seed packets often provide the number of days it takes for the plant to mature. If that number is greater than the expected growing season in your area, that plant may not be a good choice for your area.
3. Ask students to work in teams of 3 or 4 . Give each group a copy of Master 5.1, Planning Our Garden. Explain to students that they are going to plan a garden. They will choose the seeds they want to plant and plan where things will grow in their garden. They can also indicate when they would plant different crops. Point out that each student will have three ten-foot rows to plan. Explain that they can place the cut-out pieces for the different plants on their template to plan their garden.

- The cut-out pieces are sized to match the scale of the rows. For example, broccoli plants should be planted 12 inches ( 30.48 cm ) apart. The cut-out for broccoli represents 12 inches ( 30.48 cm ) of row space (without needing additional space between cut-outs).
- To simplify the lesson, the rows in the student gardens are three feet apart. (Depending on the needs of specific plants, rows could sometimes be spaced closer together, but this makes the math more complicated and isn't necessary for the purpose of this activity.) This could be a discussion point if students mention that rows aren't spaced correctly for the plants that they choose.
- Recommend to students that they put all of their cut-out pieces in place before they start gluing them to the template. In that way, they can more easily make changes if they wish.

4. Go over the second page of Master 5.1 with students. Explain that they should write the name of the seed/plant they are using, the number of each plant they are growing in their garden, and any extra information they think is helpful to remember about that plant.
5. After each team has had a chance to design their garden, ask them to post their plan in a place where other students can look at it. Allow a few minutes for students to see what other teams have planned. Students will likely be interested in what other garden plans look like. Each team will likely design a very different variety and arrangement of plants.
6. Discuss the garden plans as a class. Ask teams to describe why they chose certain plants, how they decided where to plant the seeds, and if there was anything special someone would need to think about when growing some of the plants that they selected. Students should relate their reasons to the information provided on the seed packets.
7. Wrap up the activity by giving each student a copy of Master 5.3. Allow a few minutes for students to answer the questions on the activity sheet.

## Possible Answers to Master 5.3:

1. List at least three ways that you thought about the environment when planning your garden.

- Amount of sunlight the plant needs
- Type of soil in which the plant grows best
- The temperature the plant needs
- Animals and insects living in the area
- Amount of water the plant needs

2. What might be wrong if your garden was not growing well? Explain (The quality of the soil, the amount of water the plants are getting, the amount of sunlight the plants are getting, and whether the temperatures are appropriate for the plants.)
3. Explain why fertilizers can be one way to help plants grow better. (Fertilizers can help plants grow better because they replace nutrients in the soil. When plants grow, they remove nutrients. If you grow the same plant in the same place and then harvest and remove the plant year after year, you will use up the soil's nutrients. This happens because the plants take nutrients from the soil through their roots. Fertilizers make the soil more like it was before you started growing the plants there.)

- Elaborate
- Grow an indoor garden. If you have space (or optimally a greenhouse), students can plant an indoor garden. Selecting the appropriate plants is important. Many plants will grow well in containers. Usually, larger containers are better than small ones. Herbs, such as parsley, chives, or cilantro, and lettuces typically grow well. If the site gets enough sun, pepper plants may grow well in a large container. Students can find out more about container gardening through online research. Have students work together to plan the garden, plant the garden, and maintain the garden.
- Grow an outdoor garden. If there is an appropriate space, consider planning and planting an outdoor school garden. This could be a container garden if it isn't feasible to prepare the soil for an in-ground garden. Seek volunteer help from parents to prepare the soil. Have students plan the garden by taking into consideration the space available, the local climate, the amount of time available, and so forth.
- Evaluate

After conducting these activities, review and summarize the following key concepts:

- Plants need nutrients to grow. The nutrients are provided by the soil.
- If soil lacks sufficient nutrients, they can be added using fertilizers.
- Soil is a natural resource that farmers use to grow the food we eat.
- See this lesson to get more information: CLICK HERE


## Math

## - Adding/Subtracting/Multiplying

- Students will plan and organize a garden on copy/printer paper (could use construction paper or poster paper for final design). They will pick what they will be planting and decide on how many rows and columns they will need to prepare for the plants. They can write the corresponding addition, subtraction and or multiplication equation to go along with the plan.


## Music

- Spring Planting Playlist Creation ${ }^{6}$
- Highlight a few lyrical phrases in the story and talk about the feelings they evoke.
- Have each student choose one phrase and its associated feeling from the book, and create a music playlist that evokes the same feeling.
- Compile selections from each playlist to create a whole-class playlist for the fall season. Talk about how music and other senses can enliven our writing.
- Listen to the playlist each time the class does a writing activity to remind them to write with their senses.


## Extension Activities: ${ }^{7}$

- 4R Reader
- Alice Waters and the Trip to Delicious
- Anywhere Farm
- City Green
- Edible Gardening: Growing Your Own Vegetables, Fruits, and More
- Encyclopedia of Gardening Techniques
- Garden Planner
- Grandpa's Garden
- Greening School Grounds: Creating Habitats for Learning
- Grow! Raise! Catch!
- Growing Seasons
- Gwendolyn's Pet Garden
- Harlem Grown: How One Big Idea Transformed a Neighborhood
- Harvesting Friends, Cosechando Amigos
- How Things Grow
- Is There Ever Too Much of a Good Thing?
- It's Our Garden: From Seeds to Harvest in a School Garden
- Jack's Garden
- Jayden's Impossible Garden
- Josias, Hold the Book
- Kids' Container Gardening
- Lily's Garden
- Maxine and the Greatest Garden Ever
- Miguel's Community Garden
- Mrs. Spitzer's Garden
- Nutrients for Life eLessons
- Oliver's Vegetables
- Our School Garden!
- Pick, Pull, Snap! Where Once a Flower Bloomed
- Rooftop Garden
- SOIL Reader
- School Garden Center
- School Gardens: A Guide for Gardening and Plant Science
- Seed Ball Garden Activity
- Shape, Form, and Function in the Garden
- Soil Health Education Resources
- Successful Container Gardens
- Sweet Potato Ag Mag
- The Amazing Life Cycle of Plants
- The Curious Garden
- The Dirt Book: Poems About Animals That Live Beneath Our Feet
- The Extraordinary Gardener
- The Summer My Father Was Ten
- The Ultimate Guide to Gardening: Grow Your Own Indoor, Vegetable, Fairy, and Other Great Gardens
- True Food TV's Home Gardening Video Series
- Uncle John's City Garden
- Unearthing Garden Mysteries: Experiments for Kids
- Utah Garden Planner
- We Are the Gardeners
- What Do Plants Need to Grow?
- Plants Around You: Students learn about the functions of plant parts and the environment plants need to grow.
- Properties of Soils: Students learn about the characteristics and components of soil.
- Plant-Soil Interactions: Students learn about the function of roots and how water and nutrients move through a plant.
- Plant Growth Affects the Soil: Students learn about how plant growth takes nutrients from soil and how nutrients can be replaced.
- How Does Your Garden Grow?: Students make a plan for a garden.


## Sources:

1. From Seed to Plant by Gail Gibbons
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3. https://bestthingssc.com/botanical-gardens/
4. https://hgic.clemson.edu/factsheet/planning-a-garden/
5. https://a-z-animals.com/blog/what-south-carolina-gardeners-need-to-know-this-spring/
6. https://www.yeehoopress.com/wp-content/uploads/Teachers-Guide_My-Grandpa-My-Tree-and-Me.pdf © 2023 by Roxanne Troup
7. https://southcarolinamatrix.agclassroom.org/matrix/lesson/206/
8. https://southcarolinamatrix.agclassroom.org/matrix/lesson/184/

## State Standards

## Kindergarten

- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.
- K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
- 2.2 With guidance and support, participate in shared research exploring a variety of texts; express opinions and talk about findings.


## First Grade

- 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- 2.2 Participate in shared research exploring a variety of texts; express opinions and talk about findings. 2.2 Participate in shared research; record observations, new learning, opinions and articulate findings.


## Second Grade

- 2-LS2-1. Plan and conduct an investigation to determine what plants need to grow.
- 2.2 Participate in shared research; record observations, new learning, opinions and articulate findings.


## Grade Three

- Standard 1: Write arguments to support claims with clear reasons and relevant evidence.


## Grade Four

- Standard 1: Write arguments to support claims with clear reasons and relevant evidence.


## 5th Grade

- Support an argument with evidence that plants obtain materials they need for growth mainly from air and water. (5-LS1-1)
- Standard 1: Write arguments to support claims with clear reasons and relevant evidence.

