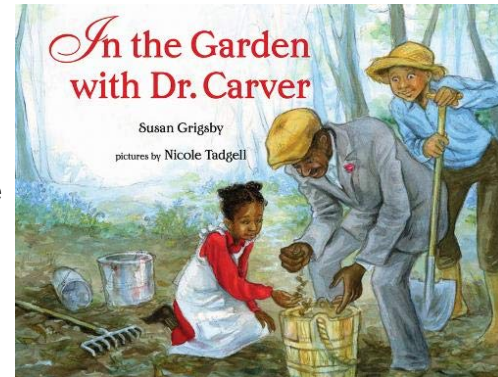


**February 2021 Book of the Month**  
***In the Garden with Dr. Carver***  
**By: Susan Grigsby**



Sally is a young girl living in the early 1900s, a time when people were struggling to grow food in soil that had been depleted by years of cotton production. One day, Dr. George Washington Carver shows up to help the grownups with their farms and the children with their school garden. He teaches them how to restore the soil and respect the balance of nature. He even prepares a delicious lunch made of plants, including “chicken” made from peanuts. And Sally never forgets the lessons this wise man leaves in her heart and mind. Susan Grigsby’s warm story shines a new light on an African American scientist who was ahead of his time.<sup>1</sup>

### Fun Facts

- George Washington Carver was born a slave, but was raised to read and earn a living.<sup>2</sup>
- George Washington Carver created many products using sweetpotatoes and peanuts, including adhesives, grease, bleach, dairy substitutes, dyes, ink, mayonnaise, meat tenderizer, polishes, shampoo, and so much more. He developed 287 peanut byproducts!<sup>2</sup>
- North Carolina ranks fifth in the nation in peanut production, growing enough peanuts each year to make nearly 4 billion PB&J sandwiches!<sup>3</sup>
- North Carolina Cooperative Extension provides a [Teaching from the Garden Guide](#) which can help you plan a school garden.

### Vocabulary<sup>4</sup> (words are in order as they appear in the book)

**Mule:** the offspring of a donkey and a horse that is valued as a work animal.

**Bask(ing):** exposed to warmth or light, typically from the sun.

**Transplant:** to move or transfer to another place.

**Nutritious:** something that nourishes the body.

**Loam:** a fertile soil of clay, sand, and decomposed (rotting) plant matter.

**Mulch:** decaying leaves, bark, or compost.

**Muck:** fertile wasted matter, such as the muddy slime in a swamp or manure.

**Compost:** decayed organic matter used as plant fertilizer

**Fertilizer:** a substance added to soil or given to plants as food in order to increase health of the soil or plant.

**Nutrients:** substances that provide essential nourishment.

**Humus:** the organic component of soil that comes from decaying plants

**Burr:** something or someone that is a constant cause of trouble or annoyance.

**Tendrils:** a slender threadlike stem of a climbing plant or vine, often growing in a spiral form, that stretches out and twines around any support.

**Darting:** moving somewhere suddenly or rapidly.

### **Discussion**

Dr. Carver worked to help people improve the Southern soil and maximize their crop yields. Using Venn diagrams, discuss with the students the questions below and compare similarities and differences. One diagram might focus on the needs of the plants and people and the other on the sources that fulfill those needs.

#### Pre-Reading

1. What do plants need to be healthy? What do people need to be healthy? Which needs are shared and which are different?
2. Where do plants and people get the things they need? What happens if they can't get those things? What might cause one of these things to not be available?

#### After Reading

3. What do you think that Dr. Carver meant when he said that we should listen to the plants to find out what they need?
4. How did Sally know what the rosebush needed? What clues did she observe to figure this out?
5. What are some ways that you might know if a plant needed one of the things that we listed in our diagram? What could you do to help?

### **Activity 1: The Natural Web<sup>4</sup>**

Dr. Carver said that everything in nature is connected. Focus on a local natural habitat and native creatures, including those that are nocturnal.

1. Brainstorm with the students a list of plants, creatures, and other elements of their natural habitat such as trees, grasslands, and ponds.
2. Divide the list among your students and ask each to answer research questions about their topic and to draw it.
3. Using a large wall, hang the students' work and add soil, sun, and people. Connect the pages with yarn, creating the strings of the web. What do they think should go at the center of the web? Is everything connected? Are people a part of this web? Which lines are food chains? What happens if one link is removed?  
Alternative web idea: Let the students stand with their picture and form a web with yarn.

### **Activity 2: Vegetable Garden Math<sup>4</sup>**

In Dr. George Washington Carver's book, *Nature Study and Gardening for Rural Schools* (1910), he encouraged teachers to use gardening as a means to teach math concepts.

Create your own sample story problems with your class based on gardening situations similar to those noted below, utilizing the math skills you wish to assess.

Next, ask your students to create their own story problems with answer keys, to share with their classmates. If you are able to build a school garden, let the story problems serve as practice for planning out the school garden.

Even if you can't plant a school garden, have vegetable seed packets available for students to read and apply the planting instructions.

### Bush Bean Profits

A packet of bush bean seeds cost \$2.95. You have to spend an additional \$16.00 on tools and fertilizer. If you can grow 100 plants from this packet and each plant produces one pound of beans, how many pounds will you harvest? (100 lbs.) If the beans sell for \$1.00 a pound, what will be your profit? ( $\$1.00 \times 100\text{lbs} = \$100$ .  $\$100 - \$2.95 = \$97.05$ )

### Planting Time

Your seed packet will tell you the length of time from planting until harvest. Identify the estimated date for the last spring frost in your region (which tells you when it's safe to plant). If your bush beans take 58 days from planting to harvest, on what date will they be ready to pick?

### Planning a Garden

Using paper (plain or graph paper) and colored pencils, lay out a rectangular garden plot  $x$  feet and  $y$  feet. Identify a scale for the students to use such as 1-inch equals 1-foot. Allow two-foot borders around the garden. The seed packets will tell you how far apart to plant both the seeds and the rows. How many different plants will you grow? How many of each vegetable will you plant in this garden plot? Make a color key showing the different vegetables you will plant. Identify the scale you've used.

### **Activity 3: Improving the Soil<sup>4</sup>**

Dr. Carver encouraged farmers to feed their soil by planting legumes, such as peanuts and cowpeas, which provided people with an excellent protein, but also released nitrogen into the soil as their roots decayed. The other method he advocated was the use of compost.

After researching compost, provide students with recycled planters (yogurt containers, etc.) with a drainage hold poked at the bottom. Let them experiment with different compost and soil mixtures, applying the concepts of balancing brown (for carbon) and green (for nitrogen) ingredients. Encourage the students to seek out a variety of possible ingredients including vegetable and fruit waste, leaf mulch, and coffee grounds. For comparative purposes, include a planting using school yard soil without any compost added. Ask them to measure and record their ingredients.

Next, have them plant a seed in each of their containers. All seeds should be taken from the same seed packet and planted at the same depth. Let them also measure out and record the water they give the plant. As soon as a seed begins to appear, have them start to record measurements of plant growth and report their findings orally, visually, and/or in a written report.

#### **Activity 4: Growing Sweetpotatoes<sup>5</sup>**

Dr. George Washington Carver was a master of agricultural experimentation. He discovered more than 100 uses for the sweetpotato, including food products (yeast, coffee, and sauces), and other products such as stains, medicines, and rubber!<sup>6</sup>

##### Materials

- Cup or largemouth glass jar
- Toothpicks (5-6 per student group)
- Sweetpotatoes

##### Instructions:

1. Divide students into groups. Provide each group of students with a sweetpotato, cup or glass jar larger than the sweetpotato, and 5-6 toothpicks.
2. Explain to students that they will be growing their own sweetpotatoes.
3. The students should stick toothpicks mid-way into the widest portion of the sweetpotato. The toothpicks should be equally spaced around the sweetpotato.
4. Then, students will carefully put the sweetpotato into the cup or jar. The toothpicks should suspend the sweetpotato over the water that gets poured into the cup/jar. The water should only touch the bottom of the sweetpotato.
5. Put the sweetpotatoes in a sunny location in the classroom that is level and safe from being knocked over.
6. Change water every week or so to prevent mold.

#### **Activity 5: Advertising Peanuts<sup>7</sup>**

Ask students to imagine they are Dr. George Washington Carver and they want to explain to people how great peanuts are. Using the information below and additional research, instruct students (or groups) to create an advertisement about peanuts. Have the students or groups choose from the following types of advertisements:

- TV Commercial
- Social Media Ad
- Newspaper or Magazine Ad
- Billboard
- Radio Ad

- Brochure or Leaflet

Advertisements should include the following information:

- What they're advertising (peanuts).
- Where the nut is grown and harvested.
- How is the nut consumed?
- Nutritional value of the nut.
- Why should consumers purchase and eat the nut?

## Peanuts

Peanuts are commercially grown in 13 states. Georgia produces the most, followed by Florida, Alabama, Texas, and North Carolina. The U.S. grows about 15% of the world's peanuts. China is the world's largest peanut producer. Peanut plants flower above ground and fruit below ground. Botanically, they are legumes. Peanuts are harvested by diggers that pull up the plant, shake off excess soil, rotate the plant so that the peanuts are up, and lay it back down in a windrow to dry for 2-3 days. A combine separates the peanuts from the vines, placing the peanuts into a hopper on the top of the machine. Peanuts are purchased raw and are processed into multiple products—boiled peanuts, roasted peanuts, peanut brittle, peanut butter, peanut oil, peanut flour and biodiesel.

## **Links**

- Teaching from the Garden (School Garden planning guide from NC Cooperative Extension)  
[https://growforit.ces.ncsu.edu/wp-content/uploads/2018/02/4H-560\\_Teach\\_from\\_the\\_Garden-Create\\_Learning\\_Landscapes.pdf?pwd=no](https://growforit.ces.ncsu.edu/wp-content/uploads/2018/02/4H-560_Teach_from_the_Garden-Create_Learning_Landscapes.pdf?pwd=no)
- NC Sweetpotato Ag Mag  
[https://www.ncfb.org/wp-content/uploads/2020/10/FINAL-WEB-ag-mag-sweetpotato\\_compressed.pdf](https://www.ncfb.org/wp-content/uploads/2020/10/FINAL-WEB-ag-mag-sweetpotato_compressed.pdf)

## **Sources**

1. <https://www.albertwhitman.com/book/in-the-garden-with-dr-carver/>
2. <https://www.daniellesplace.com/html/georgecarver.html>
3. <https://homegrown.extension.ncsu.edu/2020/10/coming-out-of-the-shell-north-carolina-peanuts/>
4. <https://www.albertwhitman.com/wp-content/uploads/2010/09/In-the-Garden-with-Dr.-Carver-Teaching-Guide.pdf>
5. <https://www.ncfb.org/wp-content/uploads/2020/10/Final-K-2-Learning-the-Life-Cycle-of-a-Sweetpotato.pdf>
6. <https://www.tuskegee.edu/support-tu/george-washington-carver/carver-sweet-potato-products>
7. <https://www.agclassroom.org/matrix/lesson/764/>

## **K-5 Subject Areas**

Reading, Writing, Speaking and Listening, Science, Social Studies, and Math

## **NC Standard Course of Study**

### **Reading**

- **RL.K.1** With prompting and support, ask and answer questions about key details in a text.

- **RL.K.2** With prompting and support, retell familiar stories, including key details.
- **RL.K.3** With prompting and support, identify characters, settings, and major events in a story.
- **RL.1.1** Ask and answer questions about key details in a text.
- **RL.1.2** Retell stories, including key details, and demonstrate understanding of their central message or lesson.
- **RL.2.1** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
- **RL.2.3** Describe how characters in a story respond to major events and challenges.
- **RL.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- **RL.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RL.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text
- **RI.K.1** With prompting and support, ask and answer questions about key details in a text.
- **RI.K.2** With prompting and support, identify the main topic and retell key details of a text.
- **RI.1.1** Ask and answer questions about key details in a text.
- **RI.1.2** Identify the main topic and retell key details of a text.
- **RI.2.1** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
- **RI.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- **RI.3.2** Determine the main idea of a text; recount the key details and explain how they support the main idea.
- **RI.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RI.4.2** Determine the main idea of a text and explain how it is supported by key details; summarize the text.
- **RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

### Writing

- **W.K.6** With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question
- **W.1.6** With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.
- **W.2.6** Recall information from experiences or gather information from provided sources to answer a question.
- **W.3.6** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
- **W.4.5** Conduct short research projects that build knowledge through investigation of different aspects of a topic
- **W.5.5** Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

### Speaking and Listening

- **SL.K.1** Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- **SL.K.2** Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
- **SL.K.3** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- **SL.K.4** Speak audibly and express thoughts, feelings, and ideas clearly.
- **SL.1.1** Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.
- **SL.1.2** Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- **SL.2.1** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.



- **SL.2.2** Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- **SL.2.4** Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent and complete sentences.
- **SL.3.2** Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **SL.3.4** Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly in complete sentences at an understandable pace.
- **SL.4.2** Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **SL.4.4** Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; adjust speech as appropriate to formal and informal discourse.
- **SL.5.2** Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **SL.5.4** Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; adapt speech to a variety of contexts and tasks.

### Science

- **1.E.2** Understand the physical properties of Earth materials that make them useful in different ways.
- **1.L.1** Understand characteristics of various environments and behaviors of humans that enable plants and animals to survive.
- **1.L.2** Summarize the needs of living organisms for energy and growth.
- **3.L.2** Understand how plants survive in their environments.
- **4.L.1** Understand the effects of environmental changes, adaptations and behaviors that enable animals (including humans) to survive in changing habitats.
- **5.L.2** Understand the interdependence of plants and animals with their ecosystem.

### Social Studies

- **K.H.1** Understand change over time.
- **K.G.1** Use geographic representations and terms to describe surroundings.
- **K.G.2** Understand the interaction between humans and the environment.
- **1.H.1** Understand that history tells a story of how people and events changed society over time.
- **1.G.1** Use geographic representations, terms and technologies to process information from a spatial perspective.
- **1.G.2** Understand how humans and the environment interact within the local community.
- **2.H.1** Understand how various sources provide information about the past.
- **2.G.1** Use geographic representations, terms and technology to process information from a spatial perspective.
- **2.G.2** Understand the effects of humans interacting with their environment.
- **3.H.1** Understand how events, individuals and ideas have influenced the history of local and regional communities.
- **3.G.1** Understand the earth's patterns by using the 5 themes of geography: (location, place, human environment interaction, movement and regions).
- **3.E.1** Understand how the location of regions affects activity in a market economy.
- **4.G.1** Understand how human, environmental and technological factors affect the growth and development of North Carolina.
- **5.G.1** Understand how human activity has and continues to shape the United States.

### Math

- **3.OA.3** Represent, interpret, and solve one-step problems involving multiplication and division.
- **3.OA.6** Solve an unknown-factor problem, by using division strategies and/or changing it to a multiplication problem.
- **3.NBT.2** Add and subtract whole numbers up to and including 1,000.
- **3.MD.3** Represent and interpret scaled picture and bar graphs.

- **4.OA.3** Solve two-step word problems involving the four operations with whole numbers.
- **4.MD.4** Represent and interpret data using whole numbers.