



# The Book Planter



## Ag in the Classroom

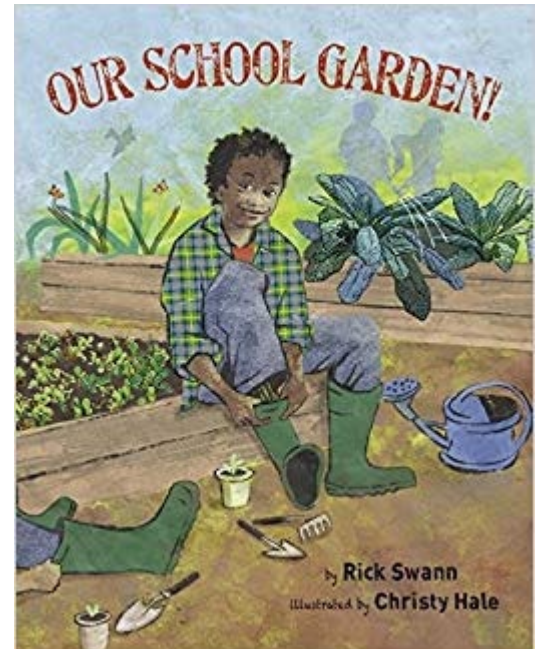
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**June 2019: *Our School Garden!***

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New city. New school. Michael is feeling all alone—until he discovers the school garden! There's so many ways to learn, and so much work to do. Taste a leaf? Mmm, nice and tangy hot. Dig for bugs? "Roly-poly!" he yells. But the garden is much more than activities outdoors: making stone soup, writing Found Poems and solving garden riddles, getting involved in community projects such as Harvest Day, food bank donations, and spring plant sales. Each season creates a new way to learn, explore, discover, and make friends.<sup>1</sup> As exemplified in *Our School Garden*, school gardens can be great STEM learning tools for students. Gardens also create a foundation for learning the importance of growing food and its origin.



### Fun Facts

- Students who have school garden programs incorporated into their science curriculum score significantly higher on science achievement tests than students who are taught by strictly traditional classroom methods.<sup>2</sup>
- Gardening during childhood exposes children to healthy food, moderate exercise, and positive social interactions and can often lead to a lifetime of gardening.<sup>2</sup>
- The school garden serves as a "safe place" for students. Studies show that large numbers of students report "that they feel calm, safe, happy and relaxed in the school garden."<sup>2</sup>
- A study of third, fourth, and fifth graders showed that students participating in a garden program had increased self-understanding, interpersonal skills, and cooperative skills when compared to non-gardening students.<sup>2</sup>
- North Carolina vegetable farmers rank nationally in the production of the following vegetables:<sup>3</sup>
  - Cabbage – North Carolina ranks ninth nationally for cabbage production.
  - Squash and Watermelon – North Carolina ranks eighth in the production of both of these crops.
  - Cantaloupe and Tomatoes – North Carolina ranks seventh in the country for both of these crops.
  - Cucumbers – North Carolina ranks fifth in the nation for cucumber production.
  - Pumpkins – North Carolina ranks fourth in the nation.

- Sweet potatoes – North Carolina ranks first in the nation for the production of sweet potatoes.
- The North Carolina Arboretum is located in Buncombe County within the Bent Creek Experimental Forest of the Pisgah National Forest.

### For Educators: How Can You Start a School Garden?<sup>4</sup>

1. Talk to your local County Farm Bureau board or apply for a Going Local Grant through NC Farm Bureau Ag in the Classroom (link in **Links** section). These sources can help you find funding, additional resources, or point you in a direction that can help.
2. Find resources.
  - a. School Garden Ag Mag (available for purchase through American Farm Bureau Foundation for Agriculture (link in **Links** section). This standards-aligned non-fiction reader is full of great ideas for themed gardens and supporting activities. It is also available in Spanish.
  - b. USDA Farm to School Fact Sheet (link in **Links** section)
  - c. NC Child Nutrition Services Fact Sheet (link in **Links** section)

### Edible Plant Parts<sup>5</sup>

1. Before the activity, give the class the following definitions:
  - **Roots:** act as an anchor, holding the plant in place. Also gathers nutrients and water for transporting up to the plant.
  - **Flowers:** contain plant parts necessary for reproduction (making new plants).
  - **Fruit:** the part of the plant that contains seeds.
  - **Leaves:** use energy from sunlight to carry out photosynthesis (producing energy).
  - **Seeds:** part of the plant that grows into new plants.
  - **Stems:** provide support for leaves, flowers and fruit of the plant.
2. Make six plant parts cards using the definitions: ROOT, STEM, LEAF, FLOWER, FRUIT, SEED.
3. Identify examples of roots, stems, leaves, flowers, fruit, and seeds from *Our School Garden* (outlined on the carrot page). Also, use the Plant Part Chart (link in **Links** section) as a reference.
4. Have students make fruit and vegetable “beanbags” using the Fruit and Vegetable Cards (link in **Links** section and attached to this activity sheet). Place each fruit and vegetable page on top of a piece of blank copy paper. Cut out the two pages together around the dashed lines for each fruit or vegetable.
5. Punch holes around the outside edges of each fruit or vegetable card. Put crumpled paper between the two sheets of cut-out paper and use yarn to sew around the edge of each “beanbag.” Staples can be used as an alternative to sewing with yarn.
6. Place six hula hoops on the floor. Lay plant part cards inside each hula hoop to distinguish them as roots, stems, leaves, flowers, fruit or seeds.

7. Separate the class into two teams. Each student will determine which edible plant part is shown on their beanbag and then try to throw it into the correct hula hoop.

- a. **Roots:** beets, carrots, radish
- b. **Stems:** kohlrabi, asparagus, potato
- c. **Leaves:** cabbage, spinach, lettuce
- d. **Flowers:** artichoke, broccoli, cauliflower
- e. **Fruit:** cherries, apple, grapes
- f. **Seeds:** sunflower seeds, corn, peanuts

8. Each player can earn three points for their team. Two points can be earned for correctly identifying the edible part of the plant. An additional point can be earned if their beanbag lands in the correct hula hoop. The team with the most points wins.



### Edible Masterpieces<sup>5</sup>

1. Ask families to donate samples of carrots, asparagus, spinach, broccoli, strawberries, and sunflower seeds. Wash all produce.
2. Provide time for students to wash their hands.
3. Instruct the students to use the fruits and vegetables to model the parts of a plant by creating edible plant art. Use carrots to make the roots of the plant, asparagus to make the stem of the plant, and so on.
4. Label each part of the plant.
5. Allow students to enjoy their artwork as a snack.



### Vegetable Weights and Circumferences<sup>6</sup>

#### Materials:

- For the teacher: 1 paring knife
- For each group: 1 food scale, 1 broccoli piece, 1 celery stalk, 1 lettuce leaf, 1 green pepper, 1 potato
- For each student: 1 hand lens, 1 measuring tape (or use string and a ruler)

#### Instructions:

1. Review the term **circumference** with the class. Review units of measurement and use of scales and rulers/measuring tapes.
2. Pass out vegetables, giving each group a broccoli piece, celery stalk, lettuce leaf, green pepper and potato. Alternatively, you may set up stations for each vegetable and have students rotate as a group from one station to the next.

3. Students will measure the vegetables' weights using the scale and lengths or circumferences using the measuring tape. Remind students to include units (centimeters, or inch and grams or ounces) when recording measurements.
4. After measurements are complete, cut the vegetables in half (the teacher should do this).
5. Instruct students to use their hand lenses to study the inside and outside of each vegetable and record the color, size, and shape.
6. Discuss the classification of each vegetable. Ask, "What group does the vegetable belong in? Does this vegetable grow below or above ground? Does it contain seeds? How did you know it belonged in the root, stem, flower, or fruit group?"

### **Homonym: One Word, Many Meanings**

In *Our School Garden*, we learn that a homonym is a word that can have different meanings, but is pronounced the same way. The example used in *Our School Garden* is the word "bank." Have students research other homonyms. Assign one homonym per student, and ask students to use the homonyms in sentences to illustrate their different meanings.

Examples: bark, mean, pound, ring, well,

For an agricultural spin on this activity, ask students to research the following homonyms which have an agricultural meaning: cab, hybrid, header, post, elevator, stalk, pen. Then, ask them to write sentences to showcase the different meanings.

### **Understanding Other Cultures**

We learn in *Our School Garden* that Harvest Day is celebrated in many cultures. What is Harvest Day? Have students research Harvest Day—its origins, its meaning, where it is celebrated, etc. Next, list the other festive events mentioned in *Our School Garden*: American Thanksgiving, Jewish Sukkoth, Chinese Moon Festival, and Indian Pongal. Ask students to work in groups, and assign one festive event per group. Students should research the event as they researched Harvest Day. Then, allow the groups to present their findings to the class. Once all of the groups have presented their events, ask the following questions for group discussion:

1. What is similar about these events?
2. What is different about these events?
3. Do you celebrate any of these events? Was the information that you found about an event you celebrate accurate to how you celebrate the event? What was different? Why do you think it was different?
4. Did anything surprise you about the events?
5. What was the most significant thing, for you personally, that you learned?

### **Links**

- NC Farm Bureau Ag in the Classroom  
<https://www.ncagintheclassroom.com/>

- School Garden Ag Mag  
<https://www.dmsfulfillment.com/FarmBureau/DMSStore/Product/ProductDetail/24764>
- USDA Farm to School Fact Sheet  
<https://farmtoschoolcensus.fns.usda.gov/sites/default/files/asset/document/School%20Gardens%20%282%29.pdf>
- NC Child Nutrition Services Fact Sheet  
<https://childnutrition.ncpublicschools.gov/information-resources/nutrition-education/school-gardens/school-gardens.pdf>
- Plant Part Chart  
[https://naitc-api.usu.edu/media/uploads/2015/03/02/EatingPlants\\_chart.pdf](https://naitc-api.usu.edu/media/uploads/2015/03/02/EatingPlants_chart.pdf)
- Fruit and Vegetable Cards  
[https://naitc-api.usu.edu/media/uploads/2015/03/02/EatingPlants\\_cards.pdf](https://naitc-api.usu.edu/media/uploads/2015/03/02/EatingPlants_cards.pdf)

#### Sources

1. <http://www.readerstoeaters.com/our-books/our-school-garden>
2. <https://www.slowfoodusa.org/contents/sdownload/3591/file/Benefits-of-School-Gardens-Denver-Urban-Gardens.pdf>
3. <https://news.ncsu.edu/2018/09/top-vegetables-in-nc/>
4. <https://www.agfoundation.org/news/school-gardens-the-why-and-how>
5. <https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=145>
6. [https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=258&author\\_state=0&cc\\_id=7&search\\_term\\_lp=garden](https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=258&author_state=0&cc_id=7&search_term_lp=garden)

#### K-5 Subject Areas

Speaking and Listening, Language, Writing, Math, and Science

#### Common Core/Essential Standards

##### 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.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.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.3.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.4.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.5.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.K.4** Speak audibly and express thoughts, feelings, and ideas clearly.
- **SL.1.4** Produce complete sentences to describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.
- **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.3.4** 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.4.4** 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.5.4** 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.

### Language

- **L.K.5** With guidance and support from adults, explore nuances in word meanings.
- **L.1.5** With guidance and support from adults, demonstrate understanding of nuances in word meanings.
- **L.2.5** Demonstrate understanding of nuances in word meanings.
- **L.3.5** Demonstrate understanding of nuances in word meanings.
- **L.4.5** Demonstrate understanding of figurative language and nuances in word meanings.
- **L.5.5** Demonstrate understanding of figurative language and nuances in word meanings.

### Writing

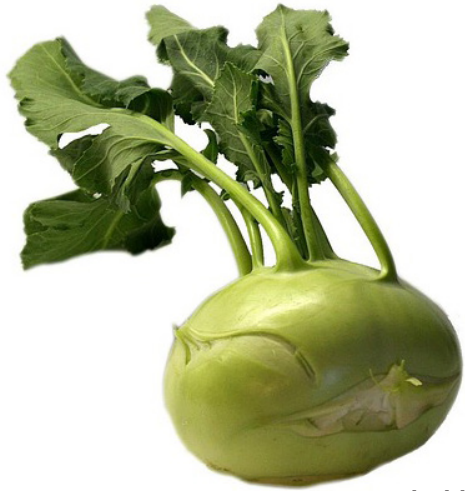
- **W.K.5** Participate in shared investigation of grade appropriate topics and writing projects.
- **W.1.5** Participate in shared research and writing projects.
- **W.2.5** Participate in shared research and writing projects.
- **W.3.5** Conduct short research projects that build knowledge about a topic.
- **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.

### Math

- **NC.2.MD.1** Measure the length of an object in standard units by selecting and using appropriate tools such as **rulers**, yardsticks, meter sticks, and measuring tapes.
- **NC.2.MD.2** Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
- **NC.2.MD.4** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

### Science

- **1.L.1.1** Recognize that plants and animals need air, water, light (plants only), space, food and shelter and that these may be found in their environment.
- **1.L.1.2** Give examples of how the needs of different plants and animals can be met by their environments in North Carolina or different places throughout the world.
- **1.L.1.3** Summarize ways that humans protect their environment and/or improve conditions for the growth of the plants and animals that live there (e.g., reuse or recycle products to avoid littering).
- **1.L.2.1** Summarize the basic needs of a variety of different plants (including air, water, nutrients, and light) for energy and growth.
- **3.L.2.1** Remember the function of the following structures as it relates to the survival of plants in their environments:
  - • Roots – absorb nutrients
  - • Stems – provide support
  - • Leaves – synthesize food
  - • Flowers – attract pollinators and produce seeds for reproduction
- **3.L.2.2** Explain how environmental conditions determine how well plants survive and grow.
- **4.L.2.1** Classify substances as food or non-food items based on their ability to provide energy and materials for survival, growth and repair of the body.



kohlrabi



cabbage



artichoke



cherries



sunflower seeds



beets



apple



asparagus



spinach



broccoli



carrots

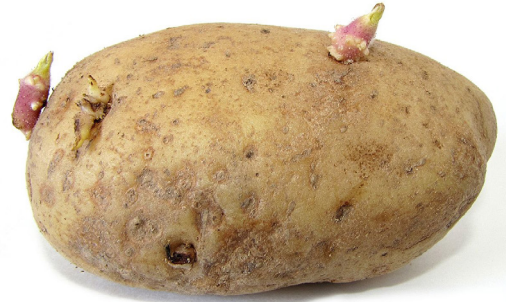


corn





grapes



potato



cauliflower



peanuts



lettuce



radish