

## Gardening Extension/Intervention Period:

Teacher Guide created by Kaila Leonberger (née Bell) ([kaila.bell@apsva.us](mailto:kaila.bell@apsva.us))

**Purpose:** To serve a diverse group of students and the schoolyard environment by creating a hands-on experience with organic, natural, and sustainable gardening practices.

**Note:** *This guide is based on Kaila Bell's Sustainability Liaison project at Thomas Jefferson Middle School during the school year 2017 - 2018. Her project goal was to create a gardening extension/intervention period for students of all grades, levels, and programs that involved working in the garden. The lessons/activities contained in this guide were done during 30 minutes of "Yellow Jacket Period" (YJP) Tuesday through Friday for a rotation of 6 weeks. Thomas Jefferson Middle School has an existing garden space, that only needed to be improved/maintained. This guide can be modified to fit your school/schedule. (Contact Kaila at [kaila.bell@apsva.us](mailto:kaila.bell@apsva.us) with questions or comments!)*

### **Part 1: Forming a Community Within Your Classroom**

We teach our students in science that biodiversity is important to maintaining a healthy, stable ecosystem. As such, diversity in our students should be encouraged and celebrated! Before starting this YJP period, I did not have a group of particular students in mind, so I emailed the staff at my school and asked for students who meet current criteria. Here is a copy of the email I used:

*"I am doing a Jefferson Garden extension YJP for Rotation 5. It's going to be cross-team and cross-grade. If you have any students that:*

- 1) Don't need SOL remediation*
- 2) Don't need academic remediation*
- 3) Like being outdoors*

*Please let me know! "*

This email proved very effective, and I easily received the names of 14 students for each rotation I did the gardening YJP (this could be done with more students, but 14 is the most students I can find into my small classroom).

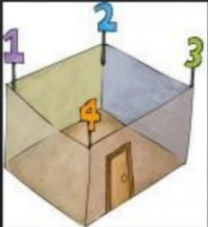


Once I had a list of 14 students, I had a mixture of all middle grades (6th/7th/8th), almost all teams, and varying academic and social levels. In addition to general education students I had newcomers from the HILT-A classes who did not speak English, students with intellectual disabilities from the Functional Life Skills program (FLS), among other special education students. It was a wonderful mix! Because we were so diverse, I wanted to make sure that the students had a chance to get to know each other. **Even if your student group is more homogenous, I still believe it is very important to begin your Gardening period with getting-to-know-you and icebreaker activities.**

I used a game called “Corners”. In Corners, the 4 corners of a classroom are labeled as 1, 2, 3, and 4. On the SMARTboard, a slideshow presentation of questions with 4 answer choices is displayed. The students choose the answer they agree with, and move in the classroom to that number corner. Because I knew I was working with students with limited English and varying reading levels, I accompanied each answer choice with a visual cue. Additionally, once the students were in their corners, I elaborated with the students about their answers, fostering discussion and light-hearted “arguments” about things such as their favorite seasons, foods, and music. In order to make the game as high-interest as possible, I included questions about social media, and popular movies. Corners is a great icebreaker game and is easy to make and prep!

### Let's play "CORNERS!"

- ◆ We are a mix of all grades and all teams. Before we work together, let's get to know each other!
- ◆ CORNERS:
- ◆ Each slide will have a question and 2, 3, or 4 answers. Each answer matches with a corner of this room
- ◆ You have 3 seconds after the question is read to choose an answer and go to the corner that matches




### LET'S PRACTICE:

Who is your Yellow Jacket Period teacher for this Rotation?


- ◆ 1) Ms. Larson
- ◆ 2) Ms. Boothe
- ◆ 3) Ms. Bell
- ◆ 4) Mr. Bitner

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### What team are you on?

- ◆ 1) Penguin 
- ◆ 2) Monarch 
- ◆ 3) Dragon 
- ◆ 4) I'm not a 7<sup>th</sup> grader!

### Favorite season?

- ◆ 1) Spring 
- ◆ 2) Summer 
- ◆ 3) Fall 
- ◆ 4) Winter 

A selection of the slides from my game of Corners, the full game I used can be found at the following link:  
<https://drive.google.com/file/d/15SPuJr8M0uO---soQvZwZJ2ThZiK2nBG/view?usp=sharing>

## Part 2: Making Student Stakeholders

For my Gardening period the students did not (for the most part) know what they had been signed up for. Once we did our icebreaker game, I showed them a few clipart pictures and asked them what they thought the YJP rotation was going to be about. Once they figured out they were working in the Jefferson Garden, it was time to communicate to the students *why* we were working in the garden.

First, the standards. The Virginia Standards of Learning for science include several references to garden-related curriculum:

### 6th Grade SOLS:

**6.7** The student will investigate and understand the natural processes and human interactions that affect watershed systems. Key concepts include

- a) the health of ecosystems and the abiotic factors of a watershed;
- b) the location and structure of Virginia's regional watershed systems;
- c) divides, tributaries, river systems, and river and stream processes;
- d) wetlands;
- e) estuaries;
- f) major conservation, health, and safety issues associated with watersheds; and

g) *water monitoring and analysis using field equipment including hand-held technology.*

**6.9** *The student will investigate and understand public policy decisions relating to the environment. Key concepts include*

- a) *management of renewable resources;*
- b) *management of nonrenewable resources;*
- c) *the mitigation of land-use and environmental hazards through preventive measures; and cost/benefit tradeoffs in conservation policies*

### **7th Grade SOLS:**

**LS.5** *The student will investigate and understand the basic physical and chemical processes of photosynthesis and its importance to plant and animal life. Key concepts include*

- a) *energy transfer between sunlight and chlorophyll;*
- b) *transformation of water and carbon dioxide into sugar and oxygen; and*
- c) *photosynthesis as the foundation of virtually all food webs.*

**LS.6** *The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include*

- a) *the carbon, water, and nitrogen cycles;*
- b) *interactions resulting in a flow of energy and matter throughout the system;*
- c) *complex relationships within terrestrial, freshwater, and marine ecosystems; and*
- d) *energy flow in food webs and energy pyramids.*

**LS.10** *The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic, change over time, and respond to daily, seasonal, and long-term changes in their environment. Key concepts include*

- a) *phototropism, hibernation, and dormancy;*
- b) *factors that increase or decrease population size; and*
- c) *eutrophication, climate changes, and catastrophic disturbances.*

**LS.11** *The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include*

- a) *food production and harvest;*
- b) *change in habitat size, quality, or structure;*
- c) *change in species competition;*
- d) *population disturbances and factors that threaten or enhance species survival; and*
- e) *environmental issues.*

**LS.12\*** *The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include*

- a) *the structure and role of DNA;*
- b) *the function of genes and chromosomes;*
- c) *genotypes and phenotypes;*
- d) *characteristics that can and cannot be inherited;*
- e) *genetic engineering and its applications; and*
- f) *historical contributions and significance of discoveries related to genetics.*

*\*Applicable if working with multiple generations of plants and/or cross-pollination*

### **8th Grade SOLS:**

Although no particular standards in Physical Science deal directly with water cycles, ecosystems, or other garden-related curriculum, all grades can explore the scientific design through gardening activities.

If the related standards don't motivate the kids, there are plenty of reasons for students to get excited about working in the garden. A garden is a beautiful addition to the students' school space. Working in and maintaining the garden can give the students a sense of pride that they are personally working towards making their school environment a happier place to be. Students may also be interested in preserving their community through the organic and native practices in the garden. Students will learn about the health and environmental benefits of organic harvesting, and the positive effects of planting and maintaining native species.

The best way to get students to care about the garden is to get them out in it!

### Part 3: Sunny Day Activities in the Garden

I am listing these activities in no particular order. Because your school may be starting from scratch or may have an already functioning garden, you might need to mix and match these activities to fit.

#### Weeding

Tools Needed: gardening gloves, hand cultivators (for stubborn weeds)

Optional Tools: Stirrup hoes (pictured in use below): Stirrup hoes are perfect if you are clearing out an unmaintained area entirely/trying to bring a plot down to bare earth. Pruning shears: I was nervous about using these with students so I only brought in one pair, and directly supervised its use.

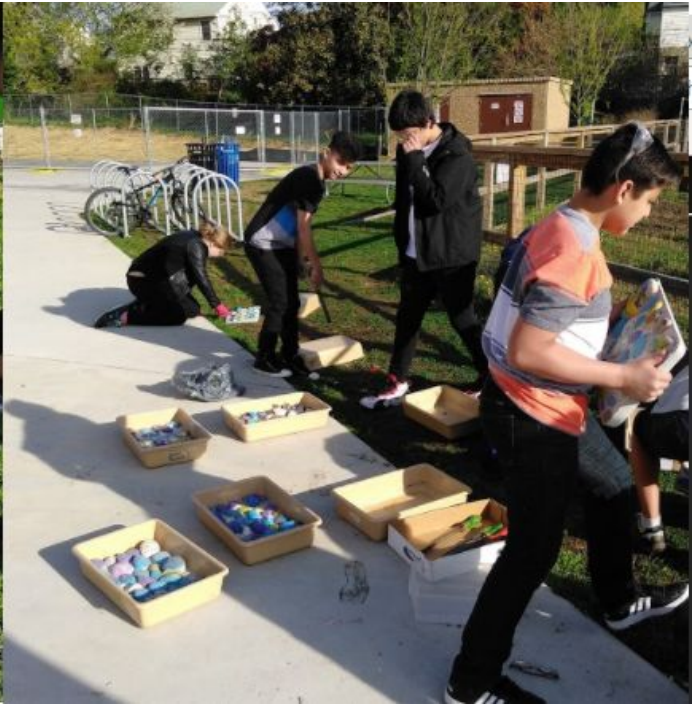


#### Decorating the Garden

Tools Needed: Smooth stones, paint pens

Optional tools: Concrete, concrete mixer, concrete molds

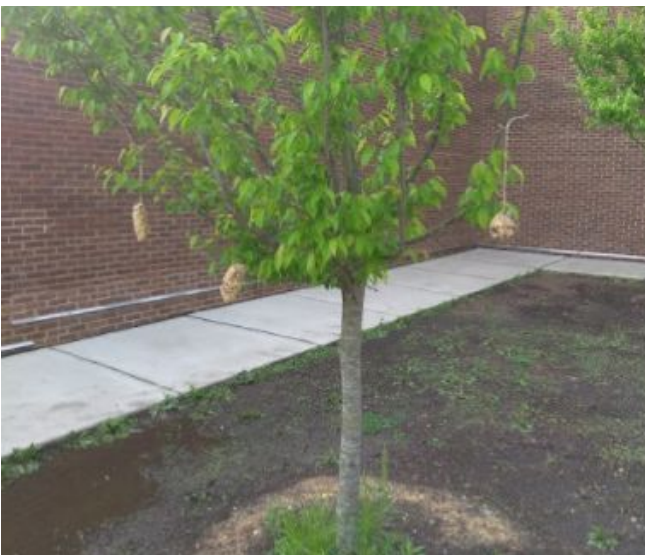
Earlier in the year, as part of the International Day of Peace Celebration, the students of TJMS decorated “Kindness Rocks” with inspirational and positive messages. Mr. Nolen’s Act II Tech Ed class then set the stones in concrete. My gardening YJP took the concrete slabs out of their molds and place them in the garden based on their own design. This project could easily be done entirely through the gardening extension period. Even if you don’t have access to concrete/a concrete mixer, the stones can be placed as decorated on their own.



#### Birdwatching/Bird-feeders:

Tools Needed: iPads with functional cameras or binoculars (for birdwatching), natural twine, pinecones, crisco/peanut butter (depending on allergies), wild bird seed, birding guide or list of birds with pictures

One of the goals of my YJP was to get the garden Audubon at Home Certified (<http://audubonva.org/wildlife-sanctuary-program> ). One of the requirements for this certification is to observe at least 10 of their sanctuary species in the space you are trying to certify. The students did a great job of birdwatching and even used their iPads to take photos of birds they couldn't immediately identify. However, it was slow going so we decided to make some bird-feeders to attract birds closer. We made the classic pinecone bird-feeders (we used crisco to adhere the seed to the pinecone instead of the traditional peanut butter because I wasn't sure if there were any peanut allergies in my group), strung them with natural twine and hung them up from trees and other structures around the garden. The birdfeeders worked great, and even though a lot of them were destroyed by storms after about a week, I knew we did not have to worry about the waste products because it was all natural.



### Planting Native Species:

Tools needed: started seedlings (can be started by the students inside the classroom, see “rainy day activities” below!), trowel, gardening gloves

Optional tools: additional potting soil if ground is overly clay or lacking in nutrients, mulch to deter weeds



My YJP focused on the existing pollinator garden behind our main food garden. The pollinator garden was established in 2008, and I was unable to determine if the garden had been kept up at all since then. The original plants placed to attract pollinators were dead, and the surviving plants were very overgrown weeds. We took the plot down to the dirt in order to prepare it for new native plant species that attract pollinators. Unfortunately, we ran out of time to get to transplanting, but I’m looking forward to getting right back in the garden with a new batch of students next year! :)

### **Part 4: Rainy Day Activities in the Classroom**

I will admit, I was unprepared for rainy days when I planned out my gardening YJP. I figured that those days could be “free” days, where we played board games together. However, we have gotten an incredible amount of rain this Spring and the rainy days were too numerous to keep wasting. Here are some activities that can be done inside the classroom.

#### Starting seeds

Tools Needed: native seeds (we used red and pink milkweed, lanceleaf, and blue indigo seeds that were donated to our YJP by Arlington County Fair and the chorus teacher), potting soil, small flower pots (for the first round of seeds I used a styrofoam platform with many openings for seeds that connected to a felted water delivery system), window sill or lighted gardening stand

Optional tools: Fertilizer pellets (most commercial potting soils will have fertilizer already in them)



Learning about native plant species:

Needed tools: internet connection, student devices (ipads or laptops)

Optional tools: good old fashioned print field guides!

This can involve looking through pictures of the garden space and identifying species, or it can involve self-centered research through one of the following helpful websites:

<http://audubonva.org/native-plants-for-wildlife/>

<http://www.dcr.virginia.gov/natural-heritage/nativeplants>

<http://vnps.org/>

Creating Labels/Garden Tags:

Needed Tools: Paper + laminate, plastic stakes, markers, list of plants to label

Optional tools: Alternatively to laminating paper labels, garden labels could be made from natural materials like recovered wood or stone.