



# *Empowering Students to Design Their Own Gardens*



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*State Arboretum of Virginia, University of Virginia*


Blanco Williams Farm, University of Virginia Sept 2024



**University of Virginia's  
Blandy Experimental Farm  
&  
The State Arboretum of  
Virginia**

**Blandy's Mission:**  
To increase understanding of  
the natural environment  
through research and  
education

Blandy Experimental Farm, University of Virginia Sept 2024

**BLANDY  
EXPERIMENTAL FARM**  
  
University  
of Virginia

Blandy Experimental Farm is a University of Virginia 700-acre field research station connected to the Department of Environmental Science. Nearly 180 acres is devoted to the State Arboretum of Virginia. The Arboretum offers diverse habitats and gardens for the public to explore. We are open to the public, free-of-charge, 365 days a year from dawn to dusk.



The Arboretum is located in the northern Shenandoah Valley 10 miles east of Winchester and 70 miles west of Washington, DC.

# State Arboretum of Virginia Education Program



Our program mission: To stimulate scientific exploration, discovery, & stewardship of our natural world by fostering a learning community among preK-12 students, educators, & scientists

Our programs serve students in grades preK -12, educators (including classroom teachers and other environmental educators), and scientists who desire to engage the preK-12 community.

## The Challenge:

- ▶ How can we facilitate STUDENT-LED garden planning, design, and planting?



The 4<sup>th</sup> grade garden site at their school  
Six 7' x 5' triangular raised beds



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This project was funded through a grant from the Chesapeake Bay Trust, award # 13246



An example program we designed for 4<sup>th</sup> graders in partnership with one of our local school districts. Students designed and planted pollination gardens at their schools.



Plants the 4<sup>th</sup> graders selected being cared for during the winter by Horticulture students in the school's green house. Plant plugs were ordered in December.





4<sup>th</sup> grade students using grids and to-scale plant circles to collaboratively design their garden plots. The circles represent plant width at maturity and flower color.



Three student design examples showing different design approaches: (1) symmetrical & anchored by two large plants & (2) symmetrical but maximizing plant diversity; (3) emphasis on color with a variety of plants. Each class selected one design for their class garden plot.



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Students testing their designs outside. The white circles represent the trye size of the plant at maturity. The PVC pipe is the plant height at maturity.



**Let's design a garden!**

Blandy Experimental Farm, University of Virginia, September 2012

# Supporting Activities

[blandy.virginia.edu/content/ed-programs-activities-and-lessons](http://blandy.virginia.edu/content/ed-programs-activities-and-lessons)

## What Plant Where?

**Goal:** Students explore & observe mature plants for attributes (height, width, flower color, leaf shape, & habitat) that should be considered when choosing plants for a pollination garden. Students understand that a diversity of plant types is important for a native plant garden.



What Plant Where?	
Student Name	Date
Name of Plant	SEA OATS
Draw or describe what the leaves look like.	Long pointy green. (grassy) point tip small.
Draw or describe what the leaves feel like.	smooth sticky
What color(s) is the flower?	NO
What is the height of the plant?	59 cm
How wide is the plant?	65 cm
Circle: Is it single or grouped?	
Circle any signs/evidence that the plant is used by any organisms. Animal Droppings Pollination Used as a home (ex. nest, web) Parts are eaten or damaged	Describe any other evidence that the plant is used by organisms.  Chew
What is the habitat like? (circle all those that apply) Sunny (Shady) Wet (Dry) Rocky (Leaf litter)	Describe the habitat.  grass + forest

Virginia SOL: Science (2018) 4.1, 4.2, 4.8. Math (2016) 4.7



# Virginia Science Standards of Learning

## Science and Engineering Practices:

- ▶ Asking questions & Defining Problems
- ▶ Planning & Conducting investigations
- ▶ Interpreting, analyzing, & evaluating data
- ▶ Constructing and critiquing conclusions & explanations
- ▶ Developing & Using Models
- ▶ Obtaining, evaluating, & communicating information

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Science (2018) 4.1, 4.2 Math 4.14

Science (2018) 4.1, 4.2, 4.8

Virginia SOL: Science (2018) 4.1, 4.2, 4.8. Math (2016) 4.7

English 4.1, 4.4, 4.6, 4.9



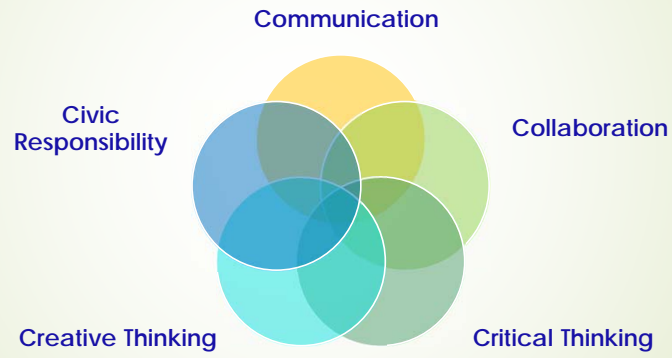
# Virginia Science Standards of Learning

Concepts that increase in complexity with grade level:

- ▶ Plant life cycles / Growth & development of organisms
- ▶ Structure & function
- ▶ VA resources & human impacts
- ▶ Scale, proportion & quantity
- ▶ Interrelationships of science, agriculture, mathematics, technology, & engineering

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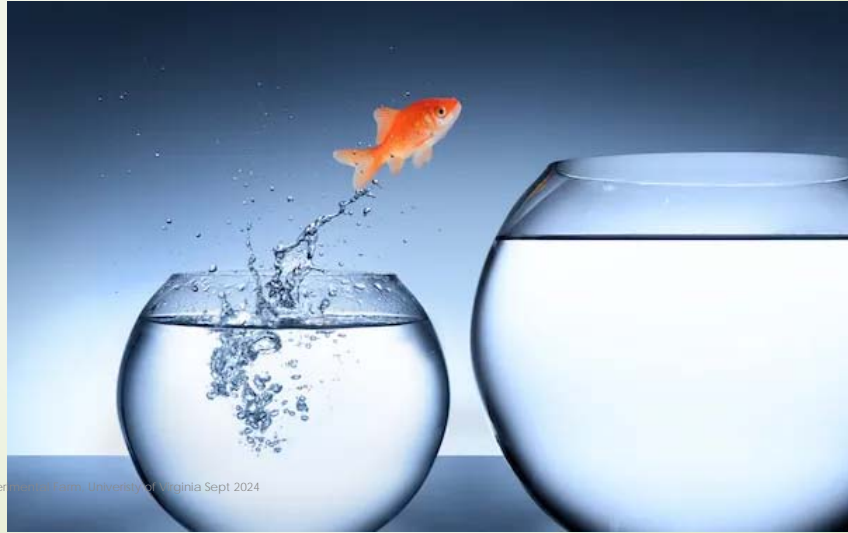
# Profile of a Virginia Graduate



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# Scaling up



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## 5<sup>th</sup> Grade Riparian Buffer

This project was funded through a grant from the NOAA Chesapeake Bay B-WET Program, award # NA18NMF45703152

Three 15' square plots laid out for the three 5<sup>th</sup> grade classes. Planting day!



5<sup>th</sup> grade riparian buffer design. Students testing their designs in their 15' long & 15' wide plots



A proud group of 5<sup>th</sup> grade landscape designers and planters with their teachers.



## 7<sup>th</sup> grade pollination garden

This project was funded through a grant from the NOAA Chesapeake Bay B-WET Program, award # NA18NMF45703152

Garden size: 18' x 18'

## Creating a scale model your pollination garden

Cut out disc indicating the appropriate diameter of your mature plants. Use the color paper to match the color flower that it produces. Each 1/2" box = 1 ft. Use this scale for determining the size of your discs. Label each disc with the species of plant and its height. Arrange your discs on the map of our garden plot below. Consider the following as you play with the arrangement:

- Are colors distributed in a visually appealing way?
- Do you have taller plants in the back and shorter plants in the front?

When you are satisfied with your arrangement, you may glue your discs down and submit your plan to your teacher. Put your name on THE BACK. We will be voting on our favorite garden plan! The finalist from each class will be submitted to your 7th grade teachers for final voting!

### J-WMS Native Plant Garden "Wish List" Garden size 18' x 18' (estimate) Most plants will be in 1 quart pots (4.75")

Common Name	Scientific Name	Attracts	Bloom color	Bloom time	Mature Height	Mature Diameter
Butterfly weed	Asclepias tuberosa	Monarch butterfly	Orange	May-Sept	1.5-3 feet	1.5-3 feet
Wild Geranium	Geranium maculatum	Native bees	purple	April-June	2 feet	18 in
Whorled Coreopsis	Coreopsis verticillata "Crim. drucei"	Birds and Butterflies	Yellow	May-Aug	2.5 ft	2ft
Woodland sunflower	Helianthus divaricatus	Native bees	Yellow	Aug-Oct	2-6ft	1-3ft
Scarlet bee balm	Monarda didyma	Hummingbirds, butterflies, bees	Red	July-Sept	4ft	3ft
Golden	Packeria	Butterflies	Yellow	March-May	1.2ft	1.15 ft

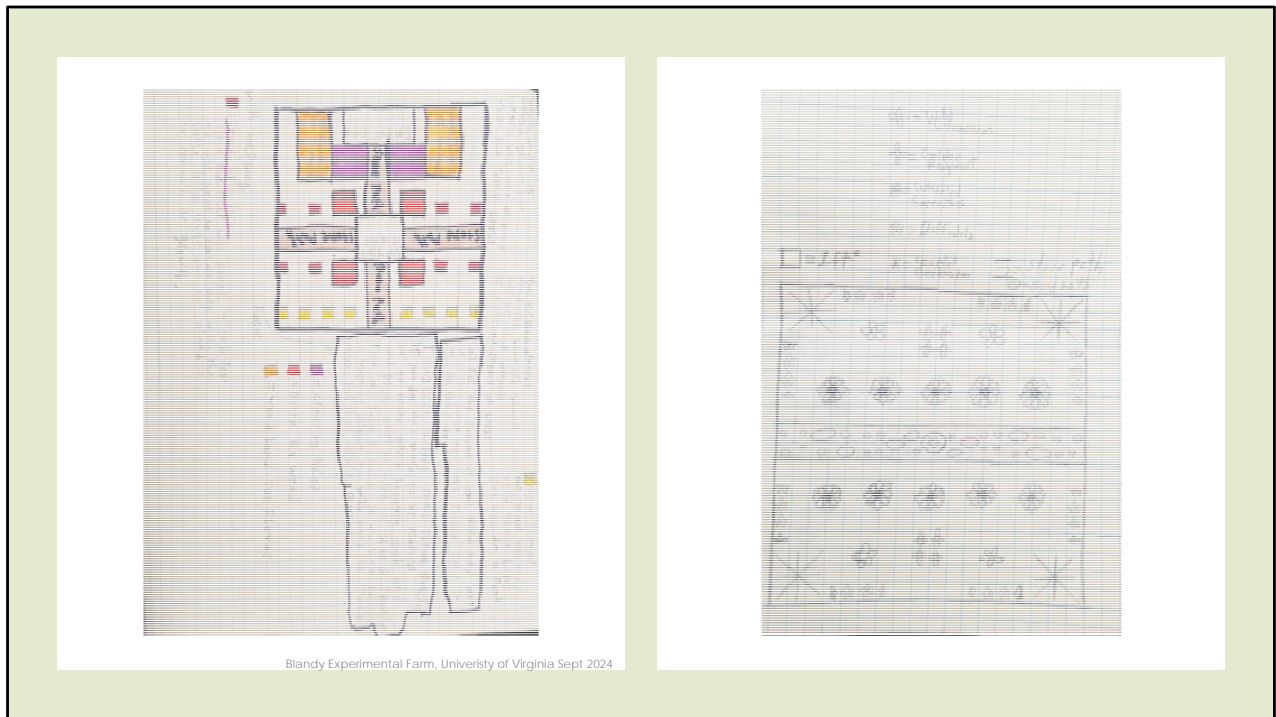
Blandy Experimental Farm, University of Virginia Sept 2021

## Designing your pollination garden

- Your garden should include a minimum of 5 different species of NATIVE plants
- Should have a variety of colors/textures/heights for visual appeal
- Your garden should attract a minimum of 3 different species of pollinators. Fill in the following chart:

	Common name	Flower Color	Pollinator(s)	Mature Height	Mature Diameter	Environmental requirements (sun/water/soil)	
1	Butterfly weed	orange	Wasp	4.5ft ↑	2.4 ft ↑	fast draining soil full sun	1 inch per week for water
2	blue indigo	blue	bees butterfly humming birds	24-36 inches	12-24 in	sun exposure soil type: moist	one inch of water per week
3	daffodils	yellow white-red	Bees	6-8 in	6-12 in	full sun/ partial shade rich well drained soil	water once plants are in full bloom
4	christmass fern	green	chrysothrix	1.5-3 ft 2-3 ft	1.5 ft	large shrub moist soil part-full shade	water once a week
5	golden rug wood	yellow	Butterflies Bees	1-2 ft	1-1.5 ft	well drained full sun moist soil	don't need water direct to it unless long time w/ out rain etc.
6							
7							
8							

Mathematics lesson created by a 7<sup>th</sup> grade mathematics teacher



Two 7<sup>th</sup> grade student designs. Students in the three 7<sup>th</sup> grade classes voted on one design to use for the planting.

## Measuring, laying stone, & planting



Planting day! Installing stepping stones, measuring spacing for the mature plants, plant placement & planting





# We grow scientists at Blandy!

BLANDY  
EXPERIMENTAL FARM



University  
of Virginia



Our programs feed the garden of the mind. Through our teaching, we fertilize curiosity about the natural world and nurture the joy of discovery.

Thank you!



Blandy Experimental Farm, University of Virginia Sept. 2024

## We'd love to have you Contact Us!!!



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### Blandly Education Conference Materials:

<https://blandy.virginia.edu/content/ed-conference-information-and-resources>