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HUNTSVILLE BOTANICAL GARDEN
A blanket of snow covers the Eloise McDonald Propst Guest Center in an exquisite sight rarely seen in Huntsville.

On the cover:
An Eastern Towhee perches among the autumn leaves at the Garden.
Hello everyone!

Autumn is a time of great change. While it may look like simply an end to the color brought by blooms of spring and summer, it is a time of renewal and preparation for winter’s rest. Look closer, and color radiates from unexpected corners: leaves tumbling to the ground, wild berries bursting with energy for woodland foragers, and the golden glow of autumn harvests. The Garden is teeming with activity during this deceptively quiet time.

During this season of gathering, we invite you to come to the Garden to share one-of-a-kind activities and experiences with your loved ones. In November and December, Galaxy of Lights returns with displays to enchant and delight guests of all ages. Join in the holiday fun by taking a stroll on Walking Nights or a leisurely cruise on Driving Nights, all under the scintillating displays that combine traditional favorites with new surprises.

Then in March, a new Garden exhibit will unfold: ORIGAMI IN THE GARDEN, created by Santa Fe artists Jennifer and Kevin Box in collaboration with world-renowned origami artists. Inspired by the art of folding paper to make elegant objects, ORIGAMI IN THE GARDEN transforms simple concepts into large-scale metal sculptures that will find their place among our own plant collections.

In this issue of the Garden Columns, you can dive into the Garden’s plant conservation collections, learn about a new professional development program for STEM teachers, find tips on how to enjoy your garden at home in the colder months, and explore the world of Tweetsville, our newest addition to the Children’s Garden.

We hope this issue inspires you to take time to enjoy and connect with nature. From every age to every interest level, the Garden offers opportunities to learn, engage, and be inspired by the plants that increase our quality of life wherever they grow.

See you at the Garden!

Sue Wagner

Greetings from our CEO

Who We Are

Open year-round, the Huntsville Botanical Garden contains diverse ecosystems to explore within its 118 acres. From grassy meadows to woodland paths, aquatic habitats to stunning floral collections, the Garden invites guests of all ages to discover the beauty and wonder of the natural environment.

A 501(c)(3) nonprofit organization, the Garden is an accredited botanical garden by Botanic Gardens Conservation International and an accredited arboretum by ArbNet, as well as a member of the American Public Gardens Association, the North American Plant Collections Consortium, and the American Horticultural Society.
Events & Exhibits at the Garden

JUNE 10 – OCTOBER 31

NOVEMBER

November 5 - December 31
Art at the Garden: Mark Inglis

11 - 27
Galaxy of Lights Walking Nights
(Closed Thanksgiving Day)

11 Veterans Day – Free daytime admission for military personnel and immediate family

14, 15, 21, 22
Galaxy of Lights Dog Walking Nights

28 Galaxy of Lights 5k Race

29 Galaxy of Lights 5k Fun Run

DECEMBER

1 - 16 Galaxy of Lights Driving Nights

December 17 - January 1
Galaxy of Lights Walking Nights
(Closed Christmas Day)

19, 20, 26, 27
Galaxy of Lights Dog Walking Nights

January 10, 12, 21

10, 12, 21

19 Terrariums: Bringing Gardening Indoors | In-person class

28 Gardening with Kids: Terrarium Style | In-person class

OCTOBER

1 Selecting Trees for Your Home Landscape: Medium Trees | In-person class series

11, 13, 15 Nature Academy: Plants & Migration

15 Selecting Trees for Your Home Landscape: Large Trees | In-person class series

22 How to Properly Prune Your Trees | In-person class

22, 28 Seeds to Sprouts: Pumpkins Galore!

SEPTMBER

September 5 - October 30
Art at the Garden: Mitzi Reoss

JANUARY

1 - 28
Feathered February

NOVEMBER

November 5 - December 31
Art at the Garden: Mark Inglis

11 - 27
Galaxy of Lights Walking Nights
(Closed Thanksgiving Day)

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28 Gardening with Kids: Terrarium Style | In-person class

FEBRUARY

7, 9, 18 Nature Academy: Garden Planning

17 - 20 Great Backyard Bird Count

MARCH

4 The Art of Sustainable Science

7, 9, 18 Nature Academy: Down in the Soil

13 - 17 Spring Break STEM Camp

FEBRUARY

May 4

APRIL 13th - 15th, 20 - 22

THE GARDEN COLUMNS 76 VOLUME 2, ISSUE 2

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Growing a Professional Development Program for Alabama STEM Educators

For many students, education starts with inspiration. A spark of curiosity can ignite a new passion; a triumphant feeling of discovery can lead to a desire to know more. Often, the most memorable teaching moments happen when the student hardly knows they’re learning at all. The challenge for an educator is to provide these moments of inspiration that will excite and engage their students—while still meeting rigorous curriculum standards. As pressure increases for teachers to do more with limited resources, this challenge becomes not only more urgent but more difficult, too. Particularly in Alabama, where public school students consistently score below the national average in math and science, educators need additional resources if they are going to both teach and inspire the next generation.

Soon, some of these resources will come from the Huntsville Botanical Garden, where a new initiative is underway to provide professional development opportunities to public school teachers across the state.

“We are in the early stages of this program,” says Sue Wagner, Chief Executive Officer of the Garden. “But we are very excited for what is to come.”

Wagner has always been an educator. Prior to transitioning to her career in education at museums and public gardens, she spent 12 years teaching in a classroom setting. There, she saw her colleagues shying away from teaching science, not because they did not value the subject, but because they lacked confidence in teaching it.

“That really stuck with me,” says Wagner. “Ever since my days in the classroom, I have asked myself: How can we help teachers feel more prepared to teach STEM subjects so that, in turn, their students are more likely to get excited about science and math?”

Flash forward to the present day. Wagner saw how the Garden could be a part of the solution, and ideas soon turned to action with the addition of Karen Colvin to the team as the Garden’s Manager of STEM Curriculum and Programs.

Herself a retired teacher with over 30 years of experience, Colvin is also familiar with the challenges that educators face every day. “You might not have enough supplies for a certain experiment, or you could be working on a limited budget, or maybe you don’t really understand the topic yourself,” she explains. “As a teacher, there are always roadblocks to overcome, and all you want to do is find the best way around them so your students can have a meaningful experience. At the end of the day, it’s always all for the students.”

At the Garden, Colvin is now leading the development of a collaborative program that will help teachers overcome the roadblocks they face in teaching STEM subjects in kindergarten through sixth grade. With an emphasis on teachers at Title I public schools, the program will provide educators with hands-on experiences that increase their confidence, content knowledge, and technical ability teaching environmental science both inside and outside their classroom walls.

Perhaps, for example, a teacher is confident naming the parts of a flower from a diagram but is unsure about identifying them on the plant itself. This program could be an opportunity to practice plant dissection with other environmental educators. Or if an educator needs help brainstorming hands-on activities that can be done in an urban school setting, this program could be a place to swap ideas with like-minded teachers facing the same challenges.

Importantly, the program will support the Alabama Course of Study and Next Generation Science Standards, two sets of content standards that guide STEM education in the state. Because these standards define the curriculum that public school teachers are required to teach, using them as a guide ensures that the program will be relevant and practical for its participants.

“We want this to be a program that meets teachers where they’re at and finds real solutions to real problems, based on the resources they really have,” says Colvin.

But the Garden is not developing the program alone. Partnering with the Friends of Birmingham Botanical Gardens and Bellingrath Gardens and Home has expanded the reach of the program outside of North Alabama to the central and southern regions of the state.

“We’re excited [to be involved] because it’s such a relevant topic in the twenty-first century, teaching STEM education,” says Dr. Tyler Mason, Director of Education and Visitor Experience at the Friends of Birmingham Botanical Gardens. “To be able to help develop a professional development program for teachers is really an opportunity to make an impact in our community and other communities across the state of Alabama.”

Dr. F. Todd Lasseigne, Executive Director of Bellingrath Gardens and Home in Mobile County, echoes Mason’s sentiments.

“We think horticulture is a great gateway to grab people and make them interested in environmental education because you can see the products,” he adds. “You can literally grow the plants.”

The nascent program has a long way to go before reaching teachers in every corner of Alabama. Currently, Wagner, Colvin, and the rest of the team are focusing on developing the program content, establishing evaluation protocols, and building relationships with administrators to garner support for the initiative.

“Our goal is to ensure that all students across the state of Alabama have access to a high-quality STEM education,” says Colvin. “None of this is being done in a bubble,” says Colvin. “We are so grateful for the partners who have already signed on to be a part of the program. With all of us together, that’s when we’ll really have an impact.”

At the time of publication, the STEM teacher development program was in the early stages of planning. To learn more about supporting this initiative, contact education@hsvbg.org.
Today, the conservation community uses a set of guidelines that define what it means to be a conservation collection, placing plant species recovery at the center of focus. Broadly speaking, a conservation collection must have clear and agreed-upon strategies for collecting, maintaining, and propagating seeds, cuttings, and divisions of each plant.

A conservation collection must always prioritize accurate record keeping. In other words, we must know where the plants come from, how many individuals or “maternal lines” are being grown and propagated, and how much of the species’ natural range is represented within the collection. Record keeping can also help with propagation efforts, as individual plants can’t always be allowed to swap pollen freely. Instead, conservation staff must swap pollen carefully to maintain the genetic strengths of each original population.

Ideally, conservation collections should also be shared among partnering institutions. Propagating and sharing plants with collaborators ensures that if something unexpected were to happen to one institution’s plants—such as a disease sweeping through the collection or an extreme weather event killing the specimens—backups are in place in other locations to ensure vital genetic diversity is not lost forever. In other words, we don’t put all of our rare and endangered eggs in one basket.

Here at the Garden, we take ex situ conservation very seriously. By establishing conservation collections of rare plants across our 118 acres, we are doing our part to protect rare and endangered plants while simultaneously connecting visitors to plants and educating them about their importance. However, not all plant collections can be considered conservation collections.

Historically, botanical gardens around the world have managed conservation collections in much the same way a stamp collector manages a stamp collection: a small handful of specimens of a particular rare plant species would be tucked away in a display bed. Such a collection has minimal conservation value due to its lack of individuals and genetic diversity, which leads to inbreeding over time. Moreover, historically, little thought was given towards the actual recovery of the species—it was deemed sufficient simply to display the plants in a garden setting.

Conservation in Action at the Garden

By Matt Candeias, PhD

Author Spotlight: Matt Candeias

Matt Candeias was born and raised in the forests of the Northeast. Matt holds an M.A. in community ecology from SUNY Buffalo State and a PhD in ecology from the University of Illinois with extensive experience in plant taxonomy and identification, habitat restoration, and research. Matt is also passionate about science communication in botany and ecology and is the author of In Defense of Plants: An Exploration into the Wonder of Plants and the host of the “In Defense of Plants” podcast. When not reading, writing, or talking about plants, Matt can usually be found hiking and photographing plants or trying to grow them in and around his home.
Changing Seasons, Changing Garden: A Guide to Fall & Winter Gardening

While many warm-weather plants have retreated, fall and winter are awash in colors and variety to enjoy. Evergreens can be trimmed and brought indoors as wreaths, garlands, and pieces for festive floral arrangements. Many types of evergreens such as hollies, winterberry, American beautyberry, and juniper are wonderful food sources for birds, offering birders the chance to observe a variety of species that feast on the berries. Houseplants and terrariums bring the enjoyment of the outdoors inside during the colder seasons, too, and they are great hobbies for any age.

Yet as the seasons change, many home gardeners grapple with what next steps to take in their gardens. With cooler temperatures and shorter daylight, maximizing efforts now will pay off big in the spring and summer. Fall and winter are a time for maintenance, preparations, and planning, while still enjoying beautiful color and delicious harvests.

Winter is a great time to prune non-spring-flowering trees and shrubs. Visual examination of each piece and following the “Five D’s” rule of pruning will ensure that everything is in tip-top shape for spring.

What are the Five D’s? They are: Dead, Dying, Damaged, Diseased, and Deranged. For example, if two branches are crossing over or rubbing against each other, they are “deranged” in their growth and need to be trimmed. When pruning diseased branches, all pruning equipment should be cleaned carefully with isopropyl alcohol to prevent the spread of the disease. Diseased cuttings should also be discarded, not composted or mulched.

When pruning, remember to prune a little bit, and then step back to examine your work. Over-pruning should be avoided to prevent damage to your plants. Generally, do not remove more than one third of the plant at a time.

Along with pruning, another maintenance task for fall and winter is mulching. While mulching can be done at any point during the year, overwintering plants with mulch in late winter can ensure great spring growth and abundant blooms.

Winter vegetables that can be grown outdoors can be semi-hardy, hardy, or ultra hardy. Semi-hardy vegetables can tolerate a light frost. These vegetables include leaf lettuces, endive, Swiss chard, beets, and carrots. Hardy vegetables can tolerate a hard frost down to about 25 degrees Fahrenheit, such as English peas, leeks, broccoli, Brussels sprouts, radishes, and turnips. Ultra-hardy vegetables are the toughest of the bunch and will grow all winter long. These include kale, spinach, and mustard greens.

As fall arrives, it is a good idea to plant your spring-flowering bulbs before Thanksgiving. Popular choices include daffodils, hyacinth, iris, crocus, allium, snowdrops, bluebells, and winter aconite. When planning where to plant them, choose a location that has the proper conditions for each variety you choose. Remember to consider the space needed, light exposure, temperature, and soil conditions.

PLANTING A WINTER GARDEN

Just because summer is over does not mean your vegetable garden has to go into hibernation. Winter crops can produce bountiful harvests, just as their warm-weather counterparts do. In fact, some vegetables thrive in cold weather and taste better for it! Knowing the lowest temperature in your hardiness zone is crucial for choosing what to grow. That temperature is the cut-off for what can grow unprotected in an outdoor vegetable garden. For example, Huntsville, Alabama, is in Zone 7, where the lowest temperature reached is around 10 degrees Fahrenheit. However, remember that many vegetables can also be grown in containers, so if inclement weather comes, those plants can be moved inside.

Tour Tweetsville:

Giant Bird Nest
An oversized bird nest, 25 feet in diameter

Enjoy the season, and happy gardening!
Your Fall & Winter Checklist for Home Garden Success

Follow these easy tips to help keep your garden healthy and your plants happy!

October
- Plant cold-season vegetables outdoors, including crops such as lettuce, broccoli, and carrots.
- Begin planting new spring-flowering trees and shrubs, such as camellias and azaleas.
- Prepare potted plants to be brought indoors by pruning, treating pests, and acclimating them to the indoor environment.
- Start planning your spring and summer gardens. Make note of what worked and what didn’t over the last year, and make plans to fix what went wrong or try something new this year.

November
- Plant spring-flowering bulbs, such as daffodils and tulips, by Thanksgiving.
- Apply a 2- to 4-inch layer of protective mulch.
- Compost fallen leaves and plant debris.
- Turn off irrigation systems and drain their lines.

December
- Harvest hollies and evergreens for indoor holiday decorations.
- Make your own festive wreaths and garlands in our classes on December 3, 8, & 10!
- Wrap trunks of young trees in areas prone to large temperature changes to protect them from cold damage.
- Safely sharpen, clean, and oil tools and pruners.
- Drain the fuel tanks of your gas-powered machines before putting them away for the winter.

January
- Prune deciduous trees and non-spring-flowering trees and shrubs.
- Remove dust from house plants by gently cleaning with lukewarm water.
- Avoid walking on lawns during a frost to protect your grass from damage.

February
- Keep bird feeders full, and refresh water during freezing temperatures.
- Show your appreciation for birds during Feathered February at the Garden! Join us for bird events and educational programs all month long.
- Start pruning ornamental grasses, roses, and perennials after Valentine’s Day.
- Spread compost in any beds that you will plant in April.

March
- Collect and test soil samples from all areas of your landscape.
- Begin fertilizing shrubs as needed according to the results of your soil test.
- Prepare your vegetable garden for spring by tilling the soil and selecting seeds.
- Start dividing perennials and ornamental grasses to create more plants to enjoy.

Quiz Time!
Are you a bird expert?

1. What is the word for the study of birds?
   A. Herpetology  B. Ornithology  C. Ophthalmology  D. Origami

2. What is the average heartbeat per minute (BPM) of a bird in flight?
   A. 50 BPM  B. 126 BPM  C. 600 BPM  D. 1,000 BPM

3. What chemical compound makes up bird eggshells?
   A. Nitrogen  B. Calcium Carbonate  C. Sodium Chloride  D. Phosphorus

4. Which bird cannot move their eyes, only turn their head?
   A. Bluebird  B. Woodpecker  C. Owl  D. Penguin

5. How many times can a woodpecker peck in a second?
   A. 20  B. 50  C. 75  D. 100

Answers on page 16!
B. Ornithology

The word "ornithology" comes from the late 16th-century Latin word "ornithologia" meaning "bird science" from the Greek "ὄρνις" ("bird") and μέγις λόγος ("theory, science, thought").

A. 20

Woodpeckers can peck up to 20 times in a second, which is too fast to be observed by the human eye. The beak of a woodpecker is strong and has a pointed tip that allows the woodpecker to pierce the bark of trees easily. The bird also has a long tongue that helps it reach deep into the tree trunk.

B. Calcium Carbonate

In general, bird egg shells are made of calcium carbonate, and so the default color is white.

C. Owl

Owls are primarily nocturnal hunters, and they have adapted many specializations that allow them to be extremely effective when hunting at night, such as the ability to fly silently, specialized hearing, and uniquely shaped eyes that allow them to spot prey.

D. 1,000 BPM

A bird's heartbeat is much slower when it is at rest. For example, a crow's resting heart rate is 345 beats per minute (BPM).
Thank you to our Corporate Partners!

The Corporate Partner program is designed to strengthen the relationship between the Huntsville Botanical Garden and the corporate community in the Greater Huntsville Area. Through the annual support of these Corporate Partners, we can provide first-class programs that allow children, families, and Garden guests to connect to plants and gain a deeper understanding of the role they play in their own environment.

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Leave Your Legacy at the Garden!

Have you considered including the Garden in your estate plans? This kind of generous donation is called a planned gift.

There are a variety of ways to support the Garden through a planned gift: a bequest intention, appreciated assets, a charitable remainder trust, life insurance, retirement plans, and more. With planned giving, any gift is meaningful.

Funds from planned gifts are responsibly invested, which provides reliable financial support for the Garden year after year.

Just as a perennial flower adds perpetual beauty by returning and multiplying each year, a planned gift will support the Garden for future generations to come.

We would be pleased to work with you and your financial or tax advisor to establish a legacy gift that meets your philanthropic and financial goals.

Learn more about planned giving at:

 stddev@hsvbg.org
256-830-4447 ext. 246

Learn more about the Corporate Partner program at:

 hsvbg.org/corporate-partners
development@hsvbg.org
256-830-4447 ext. 246

Shown here in autumn shades of yellow and green, the Chinese fringe tree continues to delight and inspire throughout every season.
“Each moment of the year has its own beauty.”

Ralph Waldo Emerson