



# Zilker Botanical Garden

## Docent Handbook

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# Welcome!

We are happy to have you here volunteering with us! We endeavor to foster a positive culture that encourages education and enjoyment of this unique environment. We look forward to helping preserve Zilker Botanical Garden together.

## History & Who We Are

This beautiful attraction in the heart of Austin was built gradually through the dedicated efforts of hundreds of donors and volunteers, in partnership with the City of Austin. The first gift was in 1917, when Andrew Jackson Zilker donated Barton Springs and the surrounding area to the City of Austin. Barton Springs Pool, a small zoo, and picnic areas became favorite places for Austinites of all ages. During the depression years, the Civilian Conservation Corps employed young men to further develop Zilker Park for Austin's citizens. Following WWII, there were still areas of Zilker Park that were not widely used. Soon a hardworking group of gardeners stepped up to the plate, and their dream of a Garden Center looked like it could become a reality.

Six garden clubs formed the Austin Area Garden Council (AAGC) in 1955 and raised the funds to build the Garden Center, which was completed and dedicated in 1964. With a mission to promote science education and love of gardening among people of all ages, AAGC's projects enhanced the garden. In 2015, AAGC created the Zilker Botanical Garden Conservancy (ZBGC), a non-profit organization whose mission is to grow the garden. In 2019, Austin Parks and Recreation Department (PARC) partnered with ZBGC in a public-private partnership as so many other botanical gardens have done. ZBGC manages garden admissions, gate operations, the website for the garden, education programming, and the Chrysalis Gift Shop. PARC is working with the ZBGC to help us expand and eventually handle all aspects of managing the gardens.

Today, Zilker Botanical Garden is located on 28 acres nestled within Zilker Metropolitan Park in the heart of downtown Austin featuring themed gardens with thousands of native and cultivated plants. Among these gardens are the Taniguchi Japanese Garden, Hartman Prehistoric Garden, and the Herb Garden.

## Our Vision

To inspire people of all ages to treasure, promote, and protect the botanical wonders of our world.

## Our Mission

To guide, enhance and grow a world-class botanical garden in the heart of Austin whose beauty and diversity will serve to inspire and educate all those who enter its gates and walk its verdant paths.

## Educational Program Overview

Docents are the educational volunteers of the garden. In such, docents will have the opportunity to volunteer for education programs from school groups to tours to garden programs. Education at Zilker Botanical Garden stems from project-based, inquiry fueled learning allowing each person to bring their own experiences, knowledge, and culture into the garden to become part of their learning. We facilitate learning by providing an opportunity to investigate; thereby providing each person agency to lead their own learning. Instead of telling someone to look at a specific plant, we ask them "what are you noticing". We ought to be flexible to let curiosity drive the learning.

We want to decrease the mechanization of learning, and transform it into inquiry, problem posing learning where the teacher/docent is not the primary distributor of knowledge, but rather all people are on equal levels as learners and participants of the learning process.

I find the best way to view our role as educators is facilitators of experiences. We want to create opportunities with many paths for inquiry. As famous Brazilian educator Paulo Freire writes in "Pedagogy of the Oppressed", children are not empty vessels to be filled with knowledge, but rather they are co-creators of knowledge (1968). Knowledge is synonymous with awareness. Awareness is not something that is universally identical, but rather it is discovered and viewed through different lenses. These lenses are shaped by life experiences, culture, and identity. One goal of education is to increase the lenses from which things are viewed: thereby increasing awareness leading to greater understanding, compassion, empathy, and kindness.

Take some time to journal your thoughts on the following questions:

*What is learning?*

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*What influences our learning?*

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*Why do we learn?*

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*How do I learn?*

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*What happens if I stop learning?*

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*How am I progressing my learning?*

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*Why do I care about helping people learn?*

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## School Programs

We welcome learners of all ages and abilities to visit the garden for either docent-led tours or self-led tours. Some schools have already developed educational material and wish to lead themselves. We find that most high schools and school summer camps select self-led, while elementary and middle school groups prefer docent led. Our docent-led tours follow the Texas Essential Knowledge & Skills (TEKS) for each grade. Each docent brings their unique experiences and knowledge to their tour but will also ensure they include the specific TEKS topics for each grade. These specific topics are available on our website under the Docent-Led Tours section as buttons. [See the page here.](#)

During docent training, docents will learn the history, ecology, biology, and natural history of each garden. Background knowledge of plants and animals is beneficial but not required. It is important to recognize that most of our school groups are kindergarten to 2<sup>nd</sup> grade, so great knowledge of all things is not required (and sometimes a hinderance as one can be compelled to tell uninterested kids superfluous information). Often kids are just excited to see the fish and whatever discussion that was planned might go to the wind. Here, we want to capitalize on the intrigue in the fish. For Kindergarten groups, we can achieve TEKS K7B.C and K5A by asking "What is the color of water?", "Is it clear?" "Is it murky", "What is it used for?", "Does anything live in it?", and "Why does it matter?". This is an example of using excitement to spark a fruitful discussion.

We have short, TEKS-based activities that we can incorporate into school visits to accomplish the educational objectives for that school. We are highly flexible to accommodate school schedules and teacher requests for content and activities. Occasionally teachers request plant life cycle activities, butterfly activities, or garden program themed activities, so we modify our general format to incorporate these into their visit. Due to the varied plan from school to school, we ask docents arrive 30 minutes prior to the school's arrival to discuss the outline and activities for the day. Sign-up for docent opportunities is through GivePulse (see Docent Requirements and Expectations section).

A typical outline for a school program is below:

**9:00** Garden opens & docents meet at the flagpole  
**9:30** School arrives and unloads near the Hummingbird Garden  
**9:40** Students bring lunches to the coolers in the Oak Grove  
**9:45** Introduction to the Garden (Welcome & Rules)  
**9:50** Break-up into groups of 10-20 and begin tour  
**11:00-11:30** End tour at to the Garden Center to wash hands  
**11:45** Head to Oak Grove for Lunch  
**12:15:** Activity  
**12:30:** Depart

This plan serves more as a rough routine rather than a strict schedule. We want to be flexible to each school and to the interests of the students. Perhaps the kids are fascinated by a water snake, and so we spend a bit more time discussing snakes and water than we had planned, such that there is less time for the planned discussion or planned activity. This is perfectly alright! We want to encourage inquiry in the garden. Efficiency driven learning and strict adherence to agendas can serve to restrict and dominate an otherwise marvelous and memorable learning opportunity.

### **Learning Objectives**

In any undertaking, establishing clear, actionable, measurable, feasible goals can direct one's actions. Learning is no different; therefore, it is important to establish learning objectives (also called educational objectives). These learning objects should always be tangible and measurable, such that one can clearly identify if it is completed. With school programs, we want to explicitly define the objective.

An example of a good learning objective is as follows:

- *Compare and contrast* plant life cycle between ferns and flowering plants

An example of a poor learning objective is as follows:

- *Understand* plant life cycles of ferns and flowering plants

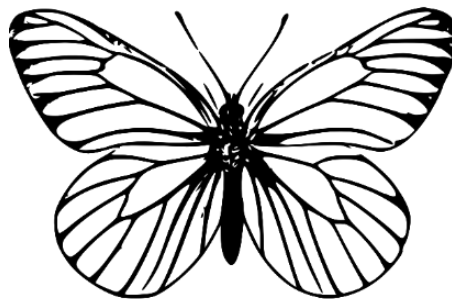
Note how the first learning objective includes a specific action to demonstrate one's understanding of plant life cycles. The second learning objective is vague and not specific as to what action needs to be accomplished to demonstrate learning objective completion. Selecting the appropriate action verbs depends on the complexity level of objective. Bloom's Taxonomy of Education Objectives provides a framework for thinking about learning objective complexity and appropriate action verbs for each level.

## **Bloom's Taxonomy of Educational Objectives**

In 1956, psychologist Benjamin Bloom released *Taxonomy of Educational Objectives*, which provided a rubric or hierarchy of educational objectives ordered by complexity. "Bloom's Taxonomy" (as it is usually called) became a tool for many educators and learners to understand the levels of complexity of learning. Revised in 2001, Bloom's Taxonomy is comprised of six levels from least complex to most complex: remembering, understanding, applying, analyzing, evaluating, and creating. By understanding Bloom's Taxonomy, learners can direct their own learning with actionable goals. It is important to clearly define the objective for each school group that visits with the aim to be able to complete the goal prior to them leaving. The learning objectives for the group will be provided in the meeting by the flagpole prior to the school's arrival, if not sooner.

As we progress through life, learning new things, we first master the lowest level of complexity (remembering) and learn our way up to the highest level of complexity (creating). Generally, a good starting point is remembering and understanding and developing skills to later evaluate and create. While it might seem reasonable that younger folks just focus on the lower levels of cognitive function, most folks are able to utilize all cognitive function levels at most ages. Think of kids making gingerbread homes or fairy houses. This is an example of designing and creating- a higher order cognitive function. Indeed, a 5-year-old will have less cognition than an experienced 35-year-old, and we might expect the 35-year-old to produce a more elaborate fairy home, but this does not discount the 5-year-olds ability to create.

It is important to note that no one level is more important than other levels, rather they require different degrees of cognition to be completed. Bloom's Taxonomy is particularly useful in developing educational strategies for developing skills. In the garden, we use them to define educational objectives when school groups visit. Bloom's Taxonomy helps students reflect on their learning & experiences to self-evaluate.

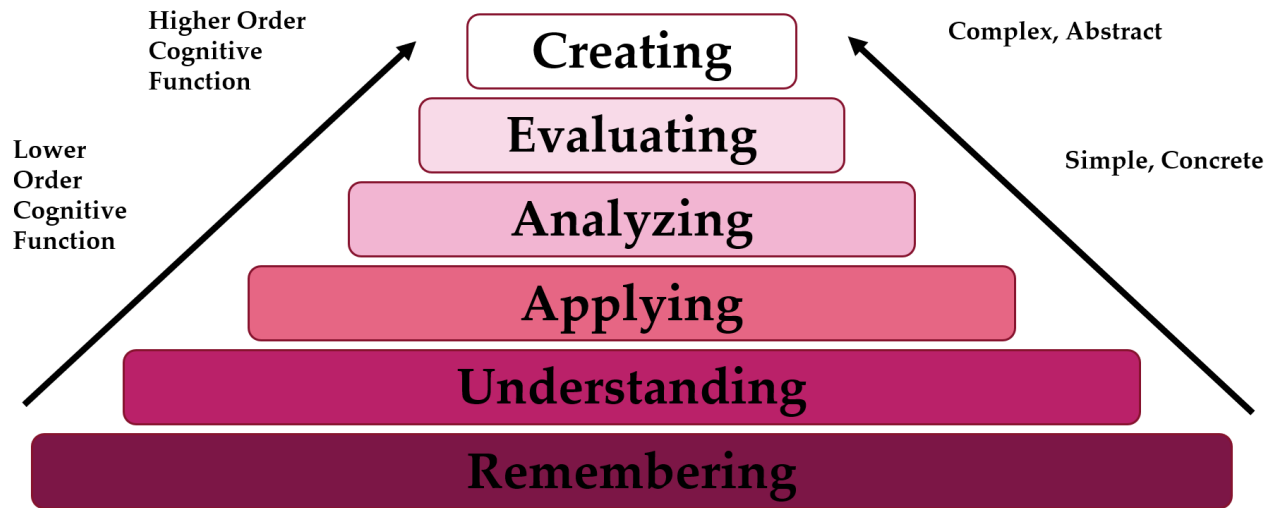


# Bloom's Taxonomy of Educational Objectives

- **Remembering:** recalling specific names, facts, dates, ideas, or concepts.
  - Action Verbs: *recall, memorize, define, repeat, state, list, label, recite*
  - Example: There are two general forms of Mediterranean cypress (*Cupressus sempervirens*): a columnar form and a spreading form.
- **Understanding:** displaying an understanding of facts, ideas, or concepts through the ability to summarize, interpret, compare, and contrast.
  - Action Verbs: *summarize, explain, restate, paraphrase, interpret, give examples, compare, contrast*
  - Example: Compare and contrast the two general forms of Mediterranean cypress (*Cupressus sempervirens*)
- **Applying:** using gained knowledge to solve a problem in a specific situation or circumstance.
  - Action Verbs: *show, produce, solve, apply, use, sketch, demonstrate, implement*
  - Example: Apply your knowledge of Mediterranean cypress (*Cupressus sempervirens*) to explain which form would be a better shade-providing tree.
- **Analyzing:** deconstructing into component parts to investigate components or organization.
  - Action Verbs: *examine, differentiate, distinguish, categorize, divide, relate, test*
  - Example: Distinguish between the landscape applications of the two forms of Mediterranean cypress (*Cupressus sempervirens*).
- **Evaluating:** judging based on presented criteria or references.
  - Action Verbs: *judge, critique, support, defend, argue, evaluate, recommend, value*
  - Example: Recommend appropriate uses of each form of Mediterranean cypress (*Cupressus sempervirens*) in the landscape and support your recommendations using three references.
- **Creating:** developing, constructing, or building ideas, concepts, organizations, or revisions using learned facts, ideas, or concepts.
  - Action Verbs: *make, build, construct, compose, design, hypothesize, develop, organize, plan, produce*
  - Example: Design a landscape plan that properly incorporates the two forms of Mediterranean cypress (*Cupressus sempervirens*).

# Bloom's Taxonomy of Educational Objectives

Revised Version  
(Anderson & Krathwohl, 2001)



**Cognitive Process**

<b>Creating</b>	<i>Generate</i>	<i>Assemble</i>	<i>Design</i>	<i>Create</i>
<b>Evaluating</b>	<i>Check</i>	<i>Determine</i>	<i>Judge</i>	<i>Reflect</i>
<b>Analyzing</b>	<i>Select</i>	<i>Differentiate</i>	<i>Integrate</i>	<i>Deconstruct</i>
<b>Applying</b>	<i>Respond</i>	<i>Provide</i>	<i>Carry Out</i>	<i>Use</i>
<b>Understanding</b>	<i>Summarize</i>	<i>Classify</i>	<i>Clarify</i>	<i>Predict</i>
<b>Remembering</b>	<i>List</i>	<i>Recognize</i>	<i>Recall</i>	<i>Identify</i>

Possible learning objective verbs dependent on Cognitive Process and Knowledge Type

(Anderson & Krathwohl, 2001)

<b>Factual</b>	<b>Conceptual</b>	<b>Procedural</b>	<b>Metacognitive</b>
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**Knowledge Type**

An overview of 2001 Taxonomy of Educational Objectives Revision is available [here](#).

Using what you know, create garden relevant learning objectives for each level of Bloom's Taxonomy. This is merely a practice exercise in understanding how to create actionable, educational objectives. Be sure to use action verbs.

*Example:*

*Remembering: Students will be able to recall the life cycle of a fern*

*Understanding: Students will be able to give examples of spore-bearing plants*

- **Remembering:** Students will be able to \_\_\_\_\_
- **Understanding:** Students will be able to \_\_\_\_\_
- **Applying:** Students will be able to \_\_\_\_\_
- **Analyzing:** Students will be able to \_\_\_\_\_
- **Evaluating:** Students will be able to \_\_\_\_\_
- **Creating:** Students will be able to \_\_\_\_\_

The learning objectives will be defined at the beginning of each group and used to assess learning.

## **Assessing Learning**

As docents, we want the right tools to make sure we can facilitate learning and ensure that there is learning. In any educational endeavor with educational objectives, it is important to assess the group to see if they are on track to accomplishing the educational objectives. These assessments can give insight into what we have learned and what we need to continue learning. In pedagogy, we classify assessments into two categories: formative and summative. Formative assessments are the frequent checks during their adventures in the garden, while summative assessments are like the last challenges before completing the adventure. In the garden, formative assessments could take the form of casual discussions, pair-and-share, raise-of hand surveys, or journaling, while summative assessments would take the form of group discussions, exit surveys, or presentations. The formative assessments aim to provide the learner an opportunity to determine how much one has learned while still in the learning process. The summative assessment is intended to assess all learning objectives across several or all levels of Bloom's Taxonomy at the end of the learning process.

## Standards Based Learning

In the State of Texas, the Texas Education Association provides the Texas Essential Knowledge and Standards (TEKS) for each grade level. These are expected concepts and skills for English language arts & reading, mathematics, science, social studies, languages other than English, health education, physical education, art, music, theatre, and technology applications. To best support students and teachers, we align our educational objectives with TEKS for that grade. Not only does having TEKS based tours and activities direct the content of our programs, but it also provides teachers grounds for receiving funding to visit the garden.

An example of a TEKS based educational objective for kindergarteners is as follows: Students will be able to give examples of the uses of bamboo (TEKS K5A.B).

On [zilker garden.org](http://zilker garden.org), the School Groups page identifies the TEKS covered for each grade.

### Connecting to the Garden: "I am Observing"

Perhaps we sit in circle in the Oak Grove with a stick (even better if it has ball moss on it). The person who has the stick is the one who can speak, and the others must listen. You start with the stick and ask, "What are you observing?", then tell everyone to observe with their ears, their eyes, their nose, and their hands. Tell everyone that we are going to start saying "I am observing". Perhaps folks will say they are observing the green leaves or the call of a cardinal, or the crunchiness of the forest floor. This activity begins their connection to the garden by taking a moment of stillness- forcing them to make their own observations. Once everyone has made their "I am observing", inform them that during our adventure through the garden, we want to always use our senses to observe. This is one example of how we can facilitate an educational experience and spark inquiry. An observation can lead to a question: "What was that sound?" "Why is the leaf crunchy?" This naturally leads to investigation. This is precisely the type of learning we want to encourage. As we are only with the folks for about half a day, our goal is not to teach them everything there is to know about the garden, but rather to guide them to observe and ask questions. The garden is full of interesting things, from flowers to fins to butterfly wings.

## Teacher Resources

Our goal is to support teachers with educational resources in the form of lesson plans, activity guides, and materials for inquiry, project-based learning. Under the Education tab on our website [www.zilker garden.org](http://www.zilker garden.org), one will find these resources. Be sure to check back periodically as we add garden program related content as well as update lesson plans and activities.

Our lesson plans are specifically written for each grade level in line with the TEKS for that grade and include an introduction to get students prepared for visiting the garden. These project-based, group activity driven lessons are written in the 5E format (Engage, Explore, Explain, Elaborate, Evaluate). These lessons often include additional materials in the appendix including flashcards, activity materials, or evaluation tools such as exit surveys.

Our activity guides are designed as individual learning exercises that can be done at home or as engaging search and finds in the garden. These can be incorporated into a classroom or done at home as a family activity.

## Lectures & Workshops

Throughout the year, we draw upon folks from near and far to share with us their knowledge in the form of lectures and workshops. We encourage docents to attend these lectures as they often present the newest research on garden relevant topics. As folks who facilitate learning, it is important to recognize that we too are always learning. Continuing education is critical as science discovers more about the world around us or as paradigms shift. Perhaps we gain a new awareness to which we can view the world – as this is truly the goal of education.

Lectures are typically free with admission, while workshops feature a variable cost dependent on materials included. Zilker Botanical Garden Members receive free admission to the garden and discounts on workshops. Most often lectures and workshops occur in the Garden Center Auditorium.

## Garden Tours

The two main categories of tours are docent led and self-guided.

### Docent Led Tours

Docent led tours are provided to groups that are 10 or larger with the typical group size per docent led tour being 12-18 folks. Docent led tours consist of a 1-2 hr tour by a docent of the garden. The docent led tours adjust to cater to the group requiring docents to be highly flexible. One group might be kindergarteners who are chiefly interested in observing the koi while the next group might be horticultural specialists who want to know the natural history of every plant. Because of the range of groups, docents are provided the details of each group prior to registering to lead the tour. Some docents prefer only to lead elementary school groups, while others prefer adult groups. This is perfectly alright. *See the school groups section for information on docent-led tours for school groups*

The Second Saturday of every month, the docents lead tours (free with admission) that start at 11am at the flagpole in front of the garden center. These tours last about 1 hour and are highly flexible to what the docent feels is worth sharing for that hour. Perhaps it is a deep dive into Texas native plants, or perhaps an overview of the entire garden. All marvelous stuff in my book.

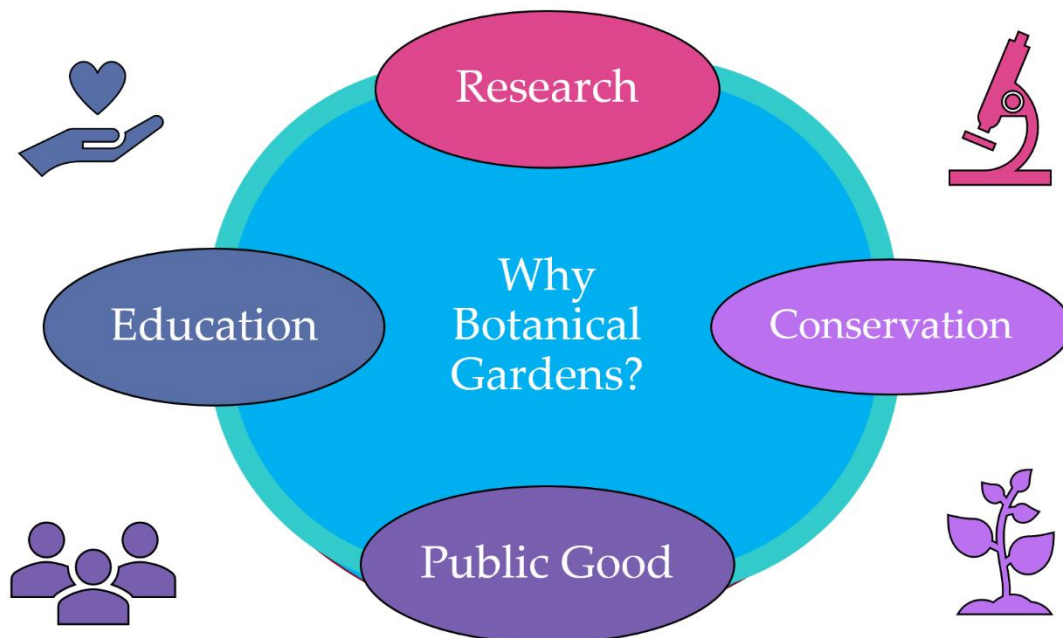
## Self-Led Tours

When groups have hundreds of folks, we are not able to promise them docent led tours. Instead, we provide them with materials for a self-led tour. (These materials are available on our website under the education tab.) Often school groups will have already developed activities that they wish to carry out in the garden. In this case, they would be classified a self-led group. Often this occurs with high schools.

Additionally, we offer self-led tours in two forms: a resource packet and audio tours. Our self-led tour resource packet provides educators the history and science behind the different gardens. The Zilker Botanical Garden Audio Tour highlights the key landmarks, history, botany, and ecology of the garden. The audio tour is available via QR code in the garden and at the end of this handbook.

## Interpretation & Signage

A botanical garden is a living museum of plants being a place for research, conservation, public good, and education. One of the key differences between a botanical garden and a park is the inclusion of educational interpretation specifically in the form of signs. This includes both labels by each plant identifying the common name



and scientific name as well as larger interpretive signs. Interpretation and signage mostly develop factual and conceptual knowledge, while activity tables and school programs chiefly develop procedural and metacognitive knowledge.

## Internship Program

The internship primarily focuses on horticulture and grounds maintenance at the Zilker Botanical Garden, although the intern may also be involved with some program and event preparation to create a well-rounded public garden experience.

Undergraduate and graduate students enrolled in horticulture-related fields of study are encouraged to apply. Selection will be based on the applicant's demonstrated interest in horticulture and on academic performance. Residence in Central Texas will be considered only when qualifications are otherwise nearly equal.

The ZBG Internship Committee must receive completed applications, including letters of recommendations, no later than March 1<sup>st</sup> of the year. Applications received after this date will not be considered. Application forms may be obtained from the applicant's school scholarship and/or career offices or by email [education@zbgconservancy.org](mailto:education@zbgconservancy.org).

The Zilker Botanical Garden Education Director is responsible for organizing and coordinating the internship program and will work in conjunction with the City Manager and Garden Center Coordinator. Most of the internship projects and work will be with PARD, while smaller horticulture related projects with ZBGC. The intern will be trained to provide tours and lead activities related to the horticulture of the garden and may be asked to assist with school programs.

## Garden Programs & Events

From Winter's "Dino Days" to Summer's "Woodland Faerie Trail", Zilker Botanical Garden runs several programs in the garden to boost attendance in less popular times. Additionally, the garden hosts large events like Surreal Garden. Docents and other volunteers are provided opportunities to lead activity tables, intrigue garden visitors, and welcome them to the garden. The specific roles docents play in garden programs and events vary.

## Docent Program Overview

Our trained educational volunteers are called docents, which derives from the Latin *docere* meaning "To Teach". Docents range in experience from college students training to become teachers to retired educators who wish to continue helping folks learn. The primary activity of docents is leading school groups on weekday mornings, followed by assisting with garden programs like Dino Days and Roots & Wings on the weekends.

# Docent Requirements and Expectations

Being a docent is a marvelous learning experience in both factual knowledge about the garden and its ecology, but also in developing one's speaking and leading skills. There are a few requirements in place to help ensure that this is fun and educational for all.

## 1. Background Check

Prior to volunteering, the Zilker Botanical Garden Conservancy education director will direct the docent-in-training to email our operations manager (operationsmanager@zbgconservancy.org) with their full name and birthdate. The operations manager will conduct the background check.

## 2. Access to Email & GivePulse

The official form of communication for the Zilker Botanical Garden Docent Program is email. Docents must be able to operate and communicate effectively by email. Emails will be sent out from education@zbgconservancy.org periodically with updates on docent opportunities including school programs and tours.

We use the volunteer coordinating software GivePulse to register docent opportunities. Zilker Botanical Garden has a GivePulse group, then the docents have a private subgroup called ZBG Docents. One will need to create a GivePulse account, join the Zilker Botanical Garden group, then request permission to join the ZBG Docent group. Once in the group, one can see the list of opportunities and register. All the relevant information will be included with each docent opportunity. Typically, an email will be sent out every 3-4 weeks with updates and the link to the docent GivePulse group reminding folks to take a gander at opportunities.

The link to the ZBG Docents group is below:

<https://www.givepulse.com/group/388353-ZBG-Docents>

## 3. Docent Training

Being a docent not only requires factual and conceptual knowledge of the history and ecology of the garden, but also procedural and metacognitive knowledge on facilitating discussions and leading folks. In addition to this, being a docent requires confidence. To best support and train our docents, we require new docents to attend a docent training workshop, shadow a docent leading a tour, and then lead a practice tour prior to leading any groups. As with most undertakings, the more one does it, the more comfortable one will be. We encourage docents to practice leading a group as many times as necessary prior to leading a group.

## 4. Volunteering

As we invest time into docent training for each docent, we ask that docents volunteer for at least five volunteer opportunities a year. A volunteer opportunity is any opportunity or shift that is signed up for on GivePulse. While some opportunities might be 2 hours for a garden program on a Saturday afternoon and others might be 4 hours with a school group on a Monday morning, these would each count as one opportunity.

## 5. Continuing Education

One of the joys of life is continual learning. As technology improves, so does our understanding of the world and the science behind it. We ask that docents attend at least 4 continuing education programs a year. This can be an AAGC educational program, a Zilker Botanical Garden Conservancy lecture or workshop, or docent training event. We do not keep track of this with any form, but rather it is understood that as a docent, one would want to enrich themselves so they can enrich the lives of others.

## 6. Garden Membership

We ask that all our docents become members of the garden. The memberships not only benefit the garden, but also provide you with numerous benefits including free admission to the garden, discounts for programs and purchases in the gift shop, as well as admission to other gardens across the country. If you are interested in a membership scholarship, please email [education@zbgconservancy.org](mailto:education@zbgconservancy.org). Check out our membership options here: <https://zilker garden.org/memberships/>

## Policies & Logistics

### Emergency Management

Emergency management refers to our plan to deal with sudden catastrophes like fire, floods, earthquakes, or explosions. Our emergency management provisions include:

- Technicians (external or internal) are available to repair leakages, damages, and blackouts.
- Fire extinguishers and other fire protection equipment that are easily accessible.
- An evacuation plan posted on each floor and online.
- Safety exits that are clearly indicated.

## Smoking

Zilker Botanical Garden Conservancy is a smoke-free workplace. All areas in our garden & workplace (like restrooms, lobby, offices, staircases, warehouses) are strictly smoke-free to protect non-smokers.

## Drug-free workplace

Zilker Botanical Garden Conservancy is a drug-free workplace. Whether you are an employee, contractor, docent or visitor, you must not bring, use, give away, or sell any drugs on company premises. If you are caught with illegal drugs or show that you are under the influence of substances, you will face disciplinary action up to and including termination.

## Alcohol

We prohibit docents from consuming alcohol during docent opportunities, but they may consume alcoholic drinks in moderation at garden events (e.g. Surreal Garden).

## Code of Conduct

As a docent, you are responsible to behave appropriately at work. We outline our expectations here. We can't cover every single case of conduct, but we trust you to always use your best judgment. Reach out to your manager if you face any issues or have any questions.

## Garden-Appropriate Communication

While volunteering and interacting with others, please be aware of garden-appropriate topics. Audibly consuming media relating to or conversing about sensitive topics may make others uncomfortable and we want everyone to be comfortable at work. Such topics may include politics, social issues, religion, a person's physical appearance, or other such things. We want everyone to feel that the garden is a safe and comfortable place to be and ask that everyone remain aware of considerate communication.

## Dress code

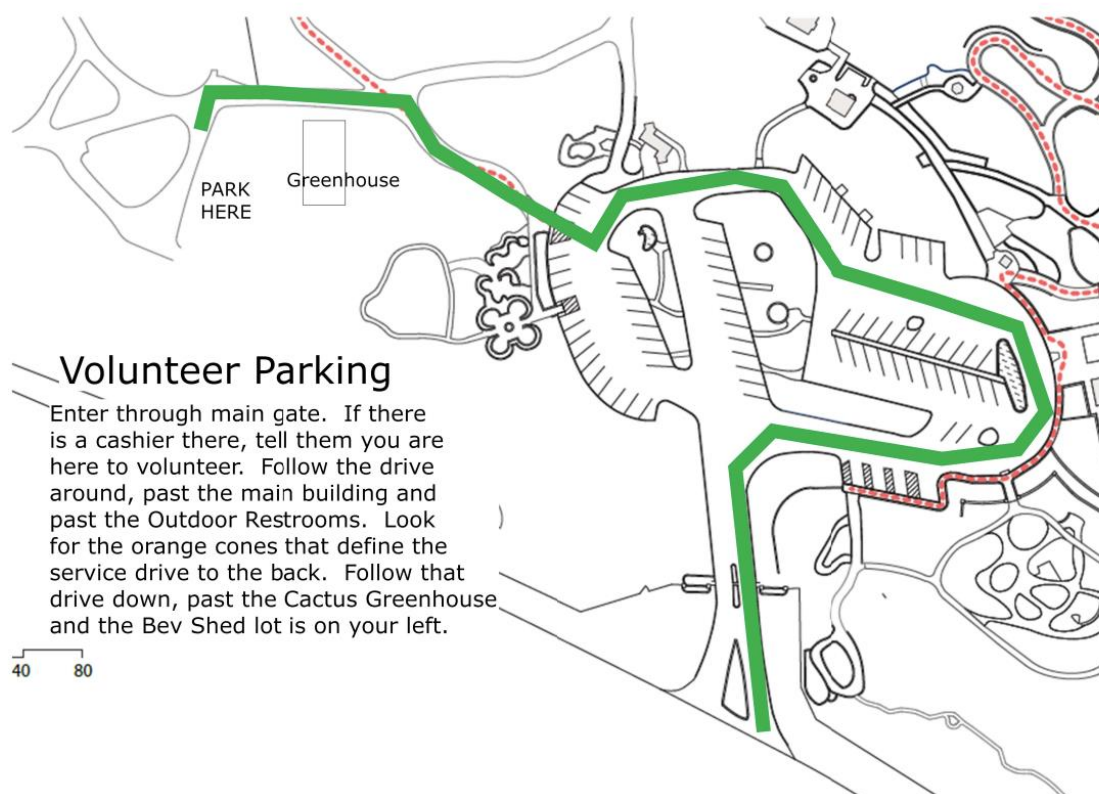
Docents should wear comfortable clothing appropriate for the weather (i.e., gloves, warm socks and hats for cold, sunscreen, and hats for heat). Non-slip or hiking type shoes are recommended. Shorts must be no shorter than mid-thigh length. The Docent Apron and/or a ZBGC name tag should be always worn when volunteering for a docent opportunity.

We also respect and permit grooming styles, clothing, and accessories that are dictated by religious beliefs, ethnicity, or disability.

## Parking

We expect you to keep our parking lot clean and park in the back of the main lot or the volunteer lot (see figure below). Please behave responsibly to avoid causing damage, injury, or loss of property.

We will not assume any liability for theft, vandalism, fire, or damage regarding an employee's vehicle in our parking lot.



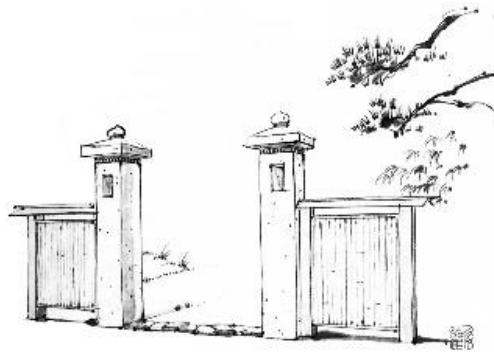
## Garden Information

Zilker Botanical Garden is home to several themed gardens each with their own history. *Learn more about the history, ecology, and botany of each garden*

### Isamu Taniguchi Japanese Garden

#### Isamu Taniguchi

In Japan, visiting a garden is a spiritual experience, or a way to find peace amidst the hectic pace of modern life. This garden was a gift to the people of Austin from Mr. Isamu Taniguchi, who was 70 years old when he built it. Taniguchi-san ("honored one") spent 18 months transforming three acres of rugged caliche hillside into a peaceful garden, which was opened to the public in April of 1969.



#### Oita Gate

The Stone Gates, dedicated in November 1999, were a gift from our Sister City of Oita, Japan, symbolizing the "lasting friendship" established between Austin and Oita.

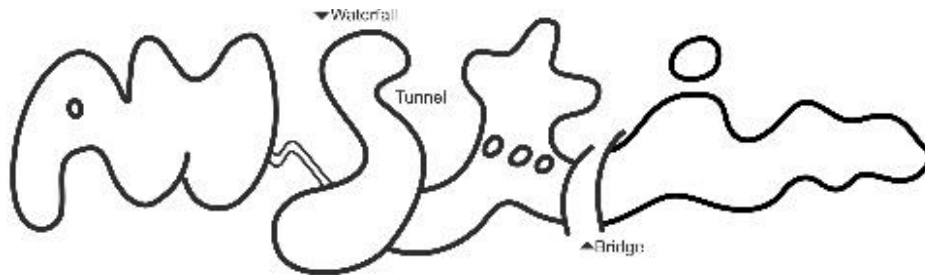


#### Teahouse

The Japanese Teahouse was a gift from the Heart of Texas Orchid Society and affords a beautiful view of the Austin skyline. The Japanese words on the outside of the Teahouse are TEN-WA-JIN, reading right to left, literally meaning "Heaven, Harmony, People". In the context of the garden, the words are meant to convey the message that man exists in harmony with nature. Taniguchi-san and his family were confined in an internment camp during World War II, and he was greatly concerned about the ravages of war.

***It has been my wish that through  
the construction of the visible garden,  
I might provide a symbol of universal peace.***

*Isamu Taniguchi*



### **Austin Ponds**

As is often done in Japan, two of the ponds were designed in the shape of a word or ideogram. In this case, the ponds in the first part of the garden spell out the word "AUSTIN", reflecting the fact that these gardens were constructed as a gift to the city.

### **Bridge to Walk Over the Moon**

The Togetsu-kyo Bridge or "Bridge to Walk Over the Moon" is positioned so that, when the moon is high, it reflects in the water and follows you across the bridge.

### **Bamboo Trail**

The Bamboo Trail was built and is maintained by the Texas Bamboo Society. Bamboo is a member of the grass family (Poaceae) contained in the subfamily Bambusoideae. The species in this subfamily can be found in diverse climates from cold mountains to hot tropical forests. Bamboo has great utility from building material to fiber to food!

### **Koi Pond**

The next pond, which contains water lilies, lotus, koi, mosquitofish, and blotched water snakes, is also symbolic. Taniguchi-san envisioned a boat with a sail, a gangplank and an anchor and chain. You can walk the gangplank to the boat. A large *Wisteria* forms the sail, and the stepping-stones will lead you down the chain and anchor.

### **Here are some important facts as folks often ask:**

- The large fish in the pond are a type of domesticated carp called Koi. They are not goldfish.
- Lucky visitors might see a Blotched Water Snake in one of the ponds; these are friendly snakes and rarely harm humans in any way. They just eat frogs and fish and are NOT venomous.

- The little insects you might see walking on the water are not spiders, they're water striders. They don't sink because of surface tension on the water and tiny hairs on their legs which trap air.
- Dragonflies eat mosquitoes, flies, bees and other small insects. They are especially valued because they help control mosquitoes.

## Riparian Streambed

This garden was previously a drainage ditch, but now it represents a vibrant area for wildlife from the Western Mosquitofish (*Gambusia affinis*) to snakes! The riparian habitat is defined by being near a stream or river resulting in moist soils and often large canopy cover. Many plants have special adaptations to surviving in or near water including specialized channels of cells called aerenchyma for transporting air through the plant from shoots to roots.

In the Riparian Streambed, you will find *Marsilea* ferns, water lily, and buttonbush. Be sure to walk across the old Congress Street foot bridge!

## Mabel Davis Rose Garden

This garden offers a display of roses, which are at their peak of beauty April to June and again in October. This is the one area of the garden where you may get off the trail, but please stay out of the beds and off the stone walls. It's time to stop and smell the roses - some have a nice fragrance; some have no fragrance at all.

- Apples, pears, plums, peaches, almonds, cherries, apricots, blackberries, raspberries, and strawberries are all members of the rose family of plants (Rosaceae).

### The Rose Family

The rose is a rose  
and was always a rose;  
But the theory now goes  
That the apple's a rose,  
And the pear is, and so's  
The plum, I suppose.  
The dear only knows  
What will next prove a rose.  
You, my love, are a rose,  
but were always a rose.

-Robert Frost

## Herb & Fragrance Garden

The Austin Herb Society maintains the Herb Garden, which was moved to the beds next to the stairs in the Rose Garden. Colloquially an herb is any plant with leaves, seeds, or flowers used for flavoring, food, medicine, or perfume. This differs from the botanical definition in that any non-woody plant that dies after flowering is considered an herb. We subscribe to the colloquial definition in the garden, but it is good to acknowledge this difference.

We encourage visitors to gently touch the foliage to feel their textures and to release the fragrance which we associate with these plants. In this garden, you will find plants that are used to season pizza, spaghetti sauce, gum, candy, soft drinks, turkey, and dressing. You will also find plants that are used to keep moths out of your clothes!

- Trees can be herbs, too. Cedar, kidneywood and even banana trees are herbs!
- Herbs grow in the wild all over Texas. Some of these are echinacea, wild violets, and sages.
- Herbs that grow in the Mediterranean area grow very well in Texas because of similar limestone soil, low rainfall, and a mild climate. Some of these herbs are rosemary, thyme, and oregano. Anyone for pizza?

You can locate more information about the Austin Herb Society on-line at [www.austinherbsociety.org](http://www.austinherbsociety.org)

### **Walk of Friends**

Help build a pathway to Zilker Botanical Garden's future. Purchase an inscribed brick at a level of either \$250 or \$500 to commemorate a special person or event. Your inscription might be your name and message or that of someone you cherish. The bricks are also excellent memorials to honor a family member, friend, or a gardener who has mentored you.

Your brick will then be placed in the Walk of Friends that curves through the tranquil and beautiful Rose Garden. This beautiful walk complements the gardens and is a place for meditation and reflection.

Your contribution will support the Zilker Botanical Garden Conservancy's projects in the gardens. Information about the Walk of Friends is available in the Garden Center.

## The Hartman Prehistoric Garden

The Hartman Prehistoric Garden is a reconstructed jungle comprised of many species of plants that thrived during the late Cretaceous period (90-66 million years ago). At that

time, this site was on the eastern shores of the ancient Great Inland Sea. Water covered the land all the way to what is now California.

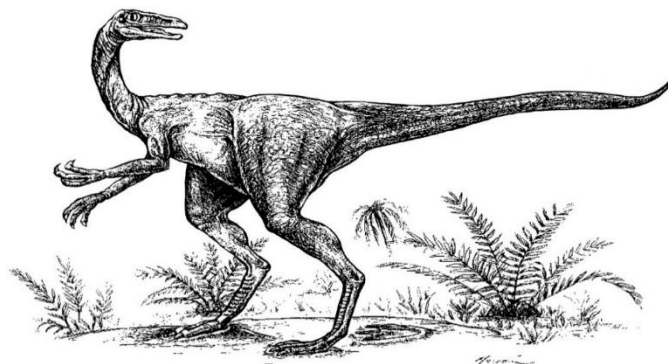
In 1992 amateur paleontologists discovered 113 tracks made by six or seven dinosaurs along with the bones of an ancient turtle here in Zilker Botanical Garden. Due to location and accessibility, this was a particularly significant find. Following the discovery, paleontologists studied the tracks and how best to preserve them, since they were deteriorating rapidly. It was decided to map and make casts of them, then rebury the tracks to prevent further loss from exposure. Since then, thanks to contributions from the Hartman Foundation and other donors, "in kind" gifts and volunteer efforts by Austin Area Garden Council members, this two-acre site has been developed as a Cretaceous habitat. The garden is composed of the kinds of plants that were around at the time of the dinosaurs. These are the spore producing plants (ferns, horsetails, and mosses), the Gymnosperms (cycads, conifers, and ginkgoes) and the first Angiosperms (magnolias, palms, gingers, and birches).

### **Cretaceous Period Flora**

The Cretaceous period (144 to 66 million years ago) was a very exciting time in the evolution of plants. Along with the appearance of the first flowering plants, insects that pollinate flowers and feed on nectar evolved, such as beetles and moths. The Hartman Prehistoric Garden includes representatives of the first flowering plants, together with plants that have existed since the Jurassic period and before (conifers, ginkgoes cycads, ferns, mosses, and liverworts). An assortment of small native reptiles (snakes, lizards, and turtles) and amphibians (frogs and salamanders) now make the Hartman Prehistoric Garden their home.

### **The Bird Mimic Dinosaur**

The full-sized sculpture on the dinosaur island is an Ornithomimid (Greek for "bird mimic") dinosaur, the same dinosaur that left its tracks here in the gardens 100 million years ago. Fast on its feet, traveling as much as 40 miles per hour, Ornithomimids would have looked very much like ostriches or emus in motion. They stood about 8 feet tall and had a larger brain (for their size) than most dinosaurs. Because they did not possess large teeth and had three fingered forepaws, Ornithomimids are thought to have lived on a diet of plants, insects, eggs, and small animal prey.



### **Where Are They Now: Dinosaurs?**

It is now believed that about 66 million years ago, a large comet, traveling at 60 times the speed of sound, struck the northernmost tip of the Yucatan Peninsula in what is now Mexico. The impact had an equivalent energy to billions of nuclear bombs and immediately vaporized everything within 1,500 kilometers. This then precipitated a global catastrophe that led to the extinction of many plant and animal species. The entire world was enveloped by thick clouds of dust that blocked the sun and cooled the earth for years. Among the many catastrophic events, the one that could have resulted in the most rapid death across the globe was the millions of tiny rock fragments raining from the sky moving at near the speed of a bullet. Large animals that were not in the water had a higher probability of being penetrated by these fragments. Small creatures and those several feet below the water were able to escape the fragments, but the shockwaves and liquified crust of the earth also posed issues. By the time the atmosphere finally cleared, and temperatures returned to normal, the non-avian dinosaurs had all perished. Today, we call the remaining dinosaurs birds.

## **The Douglas Blachly Butterfly Trail & Garden**

The Butterfly Trail and Garden has been filled with local flowers and plants that attract numerous butterflies, providing visitors with a view of many of Austin's attractive species as well as migrating varieties.

### **Life Cycle of a Butterfly**

Butterflies and moths undergo complete metamorphosis in which they go through four different life stages.

1. *Egg* - A butterfly starts its life as an egg, usually laid on a leaf.
2. *Larva* - The larva (caterpillar) hatches from an egg in about five days and eats leaves almost constantly. After 2-3 weeks, a caterpillar will become a pupa (chrysalis).
3. *Pupa* - The outer skin of this pupa will harden to become a chrysalis that will protect the developing butterfly. This is a stage in which the structures of the caterpillar are broken down and the adult structures are formed.
4. *Adult* - Eight to ten days later a beautiful flying adult butterfly emerges. An adult butterfly does not grow. Most butterflies live two to four weeks. In contrast, the migrating generation of the monarch butterfly may live up to eight months.

### **What do they Eat?**

Butterflies need two types of food: host plants for the caterpillars to eat with their chewing mouthparts and nectar plants for the adults to obtain nectar from flowers. After the adult butterfly emerges from the chrysalis, it will have new mouth parts, a curled proboscis that it can unroll to sip nectar and other liquids. Adult butterflies only have a liquid diet. In addition to nectar, butterflies sip moisture and dissolved minerals from

puddles, wet soil, fermenting fruit and even manure. The fountain in the butterfly garden is attractive to many butterflies.

Butterflies only lay their eggs on certain plants that will provide food for the caterpillars after the eggs have hatched. If you look closely, you may see caterpillars on some of the plants.

- The Black Swallowtail butterfly lays her eggs on dill, fennel, or parsley.
- Monarch and Queen caterpillars feed on milkweed.
- The Gulf Fritillary caterpillar grows on the passionflower vine.
- The Pipevine Swallowtail caterpillar requires pipevine.
- The larva of the Harvester butterfly eats aphids.

Pipevine  
Swallowtail



Black Swallowtail

Monarch



Queen



Harvester



Gulf Fritillary

### Butterfly Facts to Wow the Folks

- Butterflies taste with their feet.
- Butterflies smell with their antennae.
- Butterflies can only fly if their body temperature is above 65 degrees. Butterflies sun themselves to warm up in cool weather.
- Moths were on the earth when the Ornithomimid dinosaur was making tracks in what is now Zilker Botanical Garden. The earliest moth fossils are from the Cretaceous period, about 130 million years ago. Their development is linked to the evolution of flowering plants.
- Pesticides, even organic, will harm butterflies! It is best to use pesticides sparingly or not at all when cultivating a pollinator garden.
- The caterpillars that hang from trees in spring are Oak Leaf Rollers and Canker Worms. They are moths that generally don't damage the trees unless it is a severe infestation. They are messy and annoying, but birds enjoy devouring them.

### What is the Difference Between a Moth & a Butterfly?

- Most butterflies are diurnal (they fly during the day) while most moths are nocturnal (they fly during the night).
- Most butterflies have brightly colored wings, and most moths have subdued colors.

- Most butterflies have thin antennae with a knob on the end, while antennae of moths range from straight filaments to feathered or branched.
- Butterflies usually rest with their wings held upright.
- Moths rest with their wings spread out flat or folded over their backs.
- Most butterflies have a slender, smooth body, while most moths have a stout abdomen and a fuzzy body.
- Butterflies form a chrysalis during the pupa stage of their lives. In moths, the chrysalis is normally contained inside a cocoon made of silken threads.
- Moths have existed 50 to 100 million years longer than butterflies.

## Pioneer Settlement

### **Esperanza Schoolhouse**

The Esperanza Schoolhouse was built in 1866 near Spicewood Springs Road and served rural students' needs until about 1873. Esperanza is the Spanish word for hope. The schoolhouse was moved to Zilker Botanical Garden to prevent further deterioration. Inside the schoolhouse, one can see books, desks and benches used by students in the 1800's.

### **Swedish Pioneer Cabin**

The Swedish Pioneer Cabin was built about 1840 in Govalle ("good grazing land" in Swedish) by S. M. Swenson, Texas' first Swedish settler. Considered one of the best-preserved log cabins in the US, the cabin was moved to Zilker in 1965 by the Texas Swedish Pioneers Association, which also collected the authentic pioneer furnishings on view inside the structure.

### **Blacksmith Shop**

The Blacksmith Shop displays equipment needed to make and shape metal implements forged by pioneer blacksmiths. Coal was used to heat the forge and a bellows to fan the fire red hot so metal could be worked on the anvil. Blacksmiths made shoes for horses and parts for the wagons that were pulled by the horses. They also made brands, which were used by cowboys to mark their livestock.

### **Organic Garden**

The Organic Garden is planted with a changing display of economically important plants from around the world grown with traditional organic methods used by early pioneers.

### **Composting Demonstration**

The Composting Demonstration, sponsored by the City of Austin, shows different methods of recycling yard clippings and vegetable scraps into rich organic material. Several types of composting bins are displayed.

## Children's Garden

The Children's Garden was initially planted with plants that featured animals in their common name as some feature was like that animal. One example was the shrimp plant (*Justicia brandegeana*) whose pink bracts on their inflorescences appeared like the exoskeleton of the small aquatic arthropod. Today, the Children's Garden acts as a nature play area with a story walk themed to the current garden program. Several AAGC garden clubs are investing time and resources into revitalizing the Children's Garden, particularly the Violet Crown Garden Club.

## Cactus & Succulent Garden

This garden is another one maintained by a garden club being the Austin Cactus & Succulent Society. Cacti and succulents are grouped together due to similar soil and environmental requirements. Nearly all cacti are succulents, but not all succulents are cacti. While not all cacti and succulents can withstand the same amounts of harsh cold Austin winters as native plants, they have specially evolved drought tolerance due to their specialized water storing cells and reduced leaf area. Cacti are mostly stem succulents meaning that they store water in the stem tissue. This is due to specialized cells with undulate cell walls that can collapse and shrink or expand and fill with water. Meanwhile, the green photosynthetic cells on the outer surface remain rigid and firm, so when these photosynthetic cells need water, the inner water storing cells readily provide it; thereby shrinking.

Another type of succulence is leaf succulence in which the specialized water storing cells are in the leaf tissue. An example of leaf succulence is *Agave*. Additionally, there is root succulence, exemplified by peyote (*Lophophora williamsii*).

The Cactus family has 4 distinct sub-groups (called subfamilies). The first is Cactoidae, which comprises 80% of all cacti species. Cactoidae contains the barrel forming and column forming cacti like the golden barrel cactus and saguaro, but also include the tropical epiphytic cacti like dragon fruit. The second subfamily is the Opuntioideae, which includes the prickly pear cacti and other pad or segmented types. The third subfamily is the Maihuenioideae, which includes only two species of cushion-forming cacti from the mountains of South America. The fourth subfamily is the Pereskioideae, which includes the tree-like leafy, spiny, tropical cacti containing 3 genera. Evolutionarily, genetic analysis reveals that the Pereskioideae are the "most primitive cacti" while the Maihuenioideae evolved next and then finally the Opuntioideae and Cactoidae.

All cacti are indigenous to the Western Hemisphere, while the horticultural groups of succulents come from over thirty plant families. The major blooming period of this garden is from mid-April to mid-May.

## The Green Garden

The Green Garden was built to showcase the principles of green gardening: good design, soil improvement, use of mulch, limited lawn areas, native and low-water use plants, efficient irrigation and low maintenance. As one can see, a water conserving landscape does not have to consist of rocks and cacti. The plants displayed here have adapted well to the harsh Central Texas climate, and most are native to the area.

The kiosk features a garden map, which compares shade and sun-loving plants and identifies many of the garden's blooming plants.

Major components of a Green Garden include:

- Austin-hardy plants (natives and adapted) that require fewer pesticides and less water.
- Appropriate turf varieties to limit water, maintenance, and fertilizer needs.
- Compost and/or Dillo Dirt to recycle waste products while providing nutrients.
- Trees to reduce energy needs and improve air quality.
- Don't bag lawn clippings to reduce waste in the landfills. Leaving grass clippings on the lawn also replenishes nutrients naturally.
- Reduce pavement to allow water to filter into the yard and avoid runoff to the street.
- Mulch beds to retain water and prevent weed growth.
- Use the least toxic products when pesticides are necessary.

The Peace Aviary features a fanciful castle birdcage in black wrought iron. The doves that used to live here were set free and now the Aviary is used as decoration.

## Zilker Botanical Garden Audio Tour

Scan the QR Code to be directed to the playlist.



## Appendix

# A Long Time Ago...



## Understanding the Geologic Time Scale

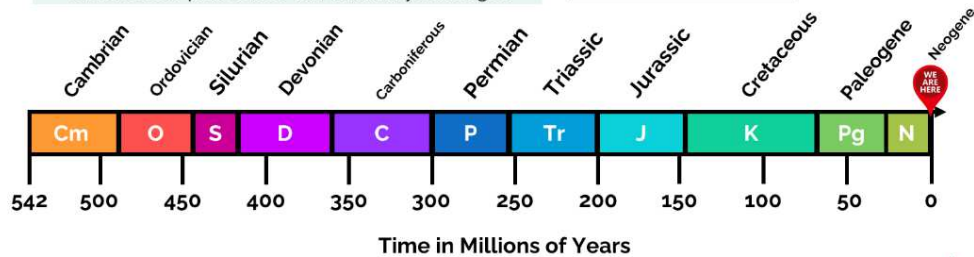
Scientists divide the history of Earth into units of five ranks: **Eon, Era, Period, Epoch, and Age**. Typically, we describe geologic time by period, as seen below.



The Hartman Prehistoric Garden is planted with living relatives of the plants that lived during the Cretaceous period 66-144 million years ago!

Eon	Era	Period	Epoch
		Period	Epoch
		Period	Epoch
		Period	Epoch
		Period	Epoch
		Period	Epoch
		Period	Epoch
		Period	Epoch
		Period	Epoch
		Period	Epoch

On the left is an example of the five ranks of geologic time with Eon being the largest and Age being the smallest. The most used rank is period (ex: Cretaceous) with the Epoch being added for extra detail (ex: Late Cretaceous)



# Ornithomimus Tracks



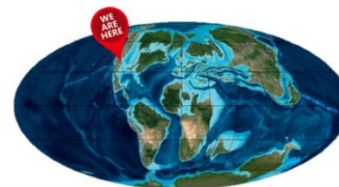
## Footprints of the "Bird Mimic" Dinosaur



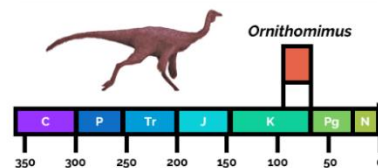
In January of 1992 as quarry land was being cleared for the planned butterfly garden, passersby noticed tracks in the limestone. They were of the late Cretaceous dinosaur *Ornithomimus* meaning "bird mimic". In order to preserve them, casts were made, and the tracks were covered. There are about 113 tracks underneath what is now the Hartman Prehistoric Garden.



*Ornithomimus* footprint found in what is now the Hartman Prehistoric Garden. Left: Ornithomimid tracks filled to create casts. Right: Ornithomimid track with keys for scale



100 million years ago, Austin was on the edges of an ancient ocean. Ornithomimids walked along the shores leaving its footprints.



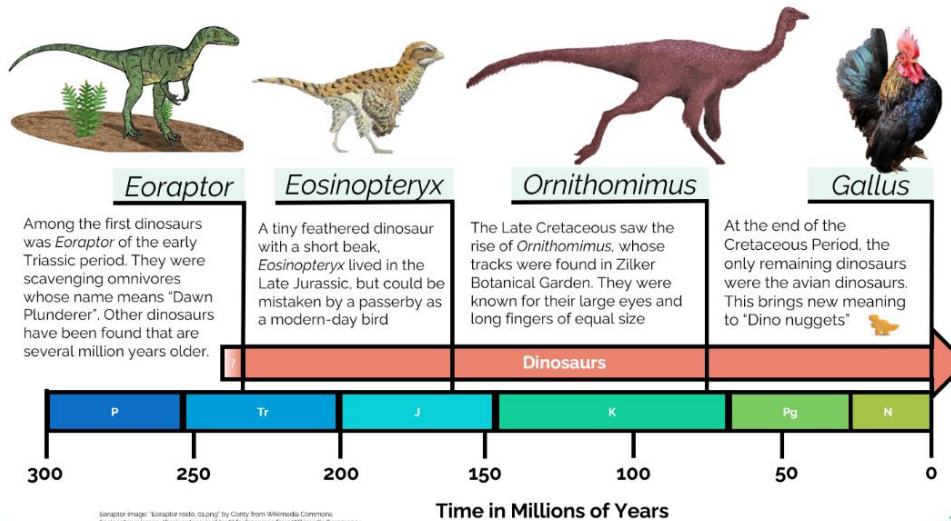
Ornithomimus image: "Ornithomimus - sp. by Tom Parker (flipped).png" by Tom Parker from Wikimedia Commons [https://commons.wikimedia.org/wiki/File:Ornithomimus\\_-\\_sp.\\_by\\_Tom\\_Parker\\_\(flipped\).png](https://commons.wikimedia.org/wiki/File:Ornithomimus_-_sp._by_Tom_Parker_(flipped).png)  
Late Cretaceous Earth Courtesy of Dr. Ron Blakey



# From the Triassic to Today



## Birds are the only remaining Dinosaurs



Eoraptor image: "Eoraptor ralla" image by Getty from Wikimedia Commons.  
Eosinopteryx image: "Eosinopteryx" by 311 from Wikimedia Commons.  
Ornithomimus image: "Ornithomimus" by Tom Parker from Wikimedia Commons.  
Gallus image: "Gallus" by Tom Parker from Wikimedia Commons.  
Prothallus image: "Prothallus" by 311 from Wikimedia Commons.

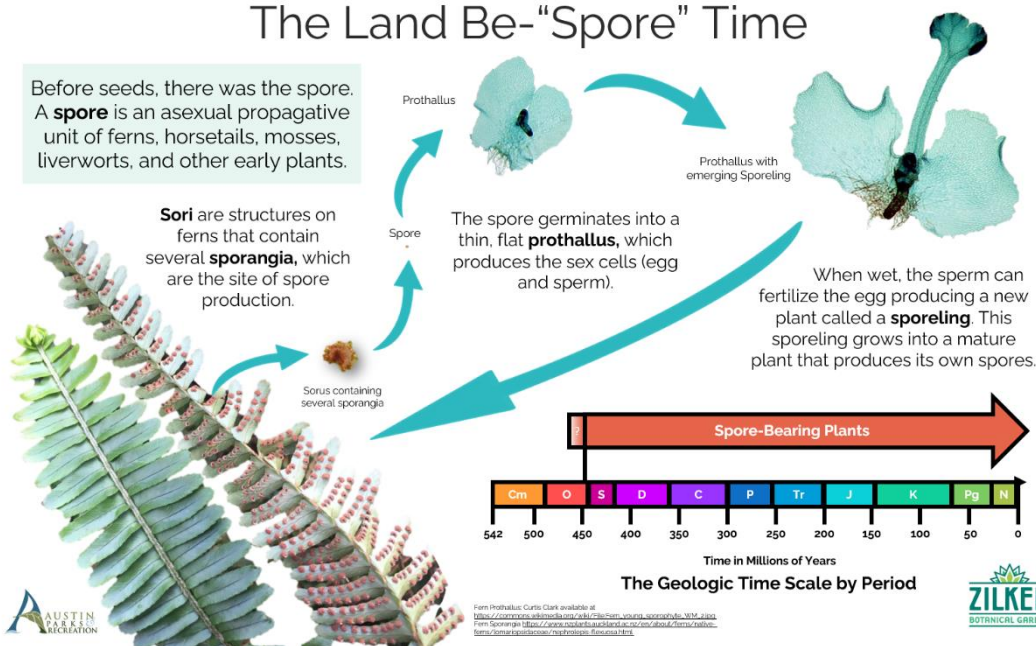


# Spore-Bearing Plants



## The Land Be-"Spore" Time

Before seeds, there was the spore. A **spore** is an asexual propagative unit of ferns, horsetails, mosses, liverworts, and other early plants.



Fern Prothallus: Curtis Clark available at [https://commons.wikimedia.org/wiki/File:Fern\\_prothallus.jpg](https://commons.wikimedia.org/wiki/File:Fern_prothallus.jpg)  
Fern Sporeling: [https://commons.wikimedia.org/wiki/File:Fern\\_sporeling.jpg](https://commons.wikimedia.org/wiki/File:Fern_sporeling.jpg)  
Fern Spore: [https://commons.wikimedia.org/wiki/File:Fern\\_spore.jpg](https://commons.wikimedia.org/wiki/File:Fern_spore.jpg)

