

Enlisting Formal Educators as Partners in Conservation

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Entry Ticket

Write your name and institution/organization on 4 “sticky notes”. Place one sticky note on each chart to rate your experience with the following topics on a scale of 1-5

(1 = not much experience, 5 = lots of experience)

- Citizen Science
- Phenology
- Collaborating with other gardens, museums, or other informal institutions
- Working with local schools or teachers

The New York Botanical Garden



Brooklyn Botanic Garden





Urban Advantage:

WHO we are and WHAT we do

Urban Advantage (UA) is a citywide science initiative that connects middle schools, teachers, students, and families with the excitement and process of scientific discovery and learning.

www.urbanadvantage.org

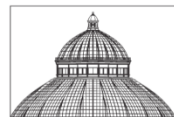
urban advantage

middle school science initiative

Partner Institutions



New York
City Council



THE NEW YORK
BOTANICAL GARDEN



New York Hall of Science



Queens
Botanical Garden
Where people, plants, and
cultures meet



Staten Island Zoo

urbanadvantagenyc.org

We are a UA school!

For more information on Urban Advantage in NYC
please visit www.urbanadvantagenyc.org:

The screenshot shows the homepage of the Urban Advantage NYC website. At the top, there is a navigation bar with links for 'Regional Organization Home', 'Organization Home', 'Login', 'Help', and 'Search'. Below this is a red header section containing the 'urban advantage middle school science initiative' logo, a 'ua Forum' logo, and a blue button for 'myUA Portal Login Click here!'. A central banner features a collage of photos showing students and teachers engaged in science activities. Below the banner is a dark navigation menu with links for 'PARTNERS', 'CALENDARS', 'SCHOOLS', 'PRINCIPALS', 'TEACHERS', 'STUDENTS', 'PARENT COORDINATORS', 'FAMILIES', 'LONG TERM INVESTIGATIONS', and 'VIDEO/PHOTOS'. The main content area is divided into three columns. The left column, titled 'UPCOMING UA EVENTS', lists three events: 'CTPD 100: Field Investigations' at the Bronx Zoo on Tuesday, April 21; 'CTPD 111: Controlled Experiment - Investigating Water Turbidity (Day 2)' at the New York Aquarium on Saturday, April 25; and 'NYBG CTPD 215 Field Investigation (Watersheds)' at the NYBG on Saturday, April 25. The middle column, titled 'URBAN ADVANTAGE CELEBRATES 10 YEARS!', features a large video player showing a crowded event. The right column, titled 'PARTNER EVENTS', lists 'SPECIAL PROGRAMS AND EVENTS - FREE WITH UA STUDENT AND FAMILY VOUCHER' and includes logos for the American Museum of Natural History, The Butterfly Conservatory, and This Annual Favorite.

Citizen Science

In North America, citizen science typically refers to research collaborations between scientists and volunteers, particularly (but not exclusively) to expand opportunities for scientific data collection and to provide access to scientific information for community members. Also known as public participation in scientific research (PPSR).

“Projects in which volunteers partner with scientists to answer real-world questions.”

Source: Cornell Lab of Ornithology

Phenology

- “Pheno” is a combining form meaning “showing, or appearing, or seeming.”
- “ology” a branch of learning.



Plant Morphology

- Closely sketch and describe your plant part with a focus on its form and structure.
- What is its “story?” Where is this plant within its annual life cycle? What information can you gather from observation alone?



Phenology Challenge Part I

- Discuss what stage your plant specimen might represent within this plant's annual life cycle.
- Draw how your assigned plant might look in each season.



Phenology Challenge

- Explore the NYBG Phenophase Guide. What more information could you add to your plant's story?
- What tools would you need to inform people about the phenology of plants in your area?



What is Phenology?

- Observe an organism's biology related to seasonal changes generally within a given year.
- Record features on a regular basis.



Plant Life Cycles

- What are events in a plant's annual life cycle?
 - Leafing
 - Flowering
 - Fruiting



Plant Phenophase Protocols

Phenophase:	Definition
Breaking Leaf Buds (Emerging Leaves)	A green leaf tip is visible at the end of the bud, but the first leaf from the bud has not yet unfolded to expose the leaf stalk (petiole).
Leaves (Unfolded Leaves)	The entire length of the leaf has emerged from the breaking bud so that the leaf stalk (petiole) is visible at its point of attachment to the stem.
Increasing Leaf Size	A majority of leaves on the plant have not yet reached their full size and are still growing larger.
Colored Leaves	One or more leaves have turned to their late season colors.
Falling Leaves	One or more leaves are falling or have recently fallen from the plant.
Open Flowers	The reproductive parts (male stamens or female pistils) are visible between unfolded petals.
Ripe Fruits	One or more ripe fruits are visible on the plant.
Recent Fruit or Seed Drop	One or more mature fruits or seeds have dropped or been removed from the plant in the recent past.

Spring Phenology Protocols

Leaf Out (Bud Burst → Mature Leaf)
Flowering

Based upon National Phenology Network Protocols

Leaf Out: Breaking Leaf Buds

One or more breaking leaf buds are visible on the plant. A leaf bud is considered "breaking" once a green leaf tip is visible at the end of the bud, but before the first leaf from the bud has unfolded to expose the leaf stalk (petiole) or leaf base.

How many buds are breaking?
Less than 3; 3 to 10; 11 to 100; 101 to 1,000; 1,001 to 10,000; More than 10,000



Leaf Out: Leaves (Unfolded Leaves)

One or more live, unfolded leaves are visible on the plant. A leaf is considered "unfolded" once its entire length has emerged from the breaking bud so that the leaf stalk (petiole) or leaf base is visible at its point of attachment to the stem. Do not include fully dried or dead leaves.

What % of the canopy is full with leaves? Ignore dead branches in your estimate. Less than 5%; 5-24%; 25-49%; 50-74%; 75-94%; 95% or more.



Leaf Out: Increasing Leaf Size

A majority of leaves on the plant have not yet reached their full size and are still growing larger. Do not include new leaves that continue to emerge at the ends of elongating stems throughout the growing season.

What % of full size are most leaves?
Less than 25%; 25-49%; 50-74%; 75-94%; 95% or more.



Flowering: Open Flowers

One or more open, fresh flowers are visible on the plant. Flowers are considered "open" when the reproductive parts (male stamens or female pistils) are visible between or within unfolded or open flower parts (petals, floral tubes or sepals). Do not include wilted or dried flowers.

What percentage of all fresh flowers (buds plus unopened plus open) on the plant are open? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), estimate the percentage of all individual flowers that are open. Less than 5%; 5-24%; 25-49%; 50-74%; 75-94%; 95%<.



Fall Phenology Protocols

Leaf Color Change
Leaf Drop
Fruit Ripening

Based upon National Phenology Network Protocols

Leaf Color Change



The leaves have changed to their late season color(s), and there is virtually no green left in the leaves.

- ⊙ >50% of tree?
- ⊙ >95% of tree?

If drought seems to be the cause of leaf color change for a plant, please make a comment about it for that plant.

Leaf Fall



For the whole plant, the **leaves have fallen off and are** and are brown/dead

⦿ >50% of tree?

⦿ >95% of tree?

If drought seems to be the cause of leaf fall for a plant, please make a comment about it for that plant.

Fruit Ripening

The fruit has become ripe in three spots on tree
(*e.g.* color change, splitting, both, etc.)



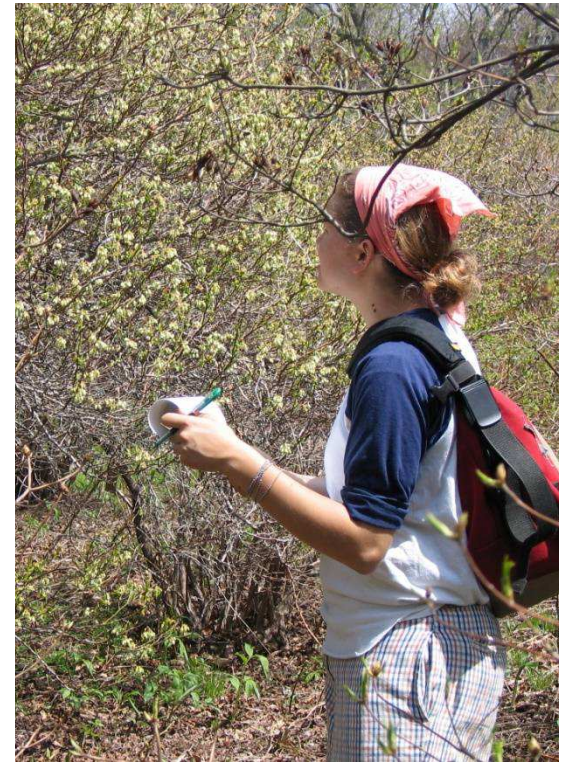
What Materials do I Need?

- Data sheet
- Pencil
- Clipboard
- Phenology guide
- Binoculars
- Tree ID (optional)



What to Look for and Record

- **Yes (Y)** – if the phenophase *is* occurring
- **No (N)** – if the phenophase *is not* occurring
- **Uncertain (?)** – if you are *not certain* whether the phenophase is occurring
- Do not record anything if you *did not check* for this phenophase



Phenology Data Collection

For each plant species, record the **phenophase** you observe on the data collection sheet you will use in the field

CITIZEN SCIENCE: NATIVE FLORA GARDEN PHENOLOGY

Native Flora Garden (Page 1 of 2)		American Beech	American Beech	American Beech	American White-hazel	Black Gum (Tupelo)	Black Gum (Tupelo)	Flowering Dogwood	Red Maple	Red Maple	Red Maple
Observer(s):	Breaking Leaf Buds (Emerging leaves)	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
	Leaves (Unfolded Leaves)	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Date:	Increasing Leaf Size	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Time Start: hr min	Colored Leaves	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Time End: hr min	Falling Leaves	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Travel Time: hr min	Open flowers	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Snow on ground? y n ?	Ripe fruits	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
% ground covered	Recent fruit or Seed Drop	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Snow in canopy? y n ?	Check when data entered online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Red Oak	Red Oak	Red Oak	Spinebush	Spinebush	Spinebush	Sugar Maple	Sugar Maple	Sugar Maple
Breaking Leaf Buds (Emerging leaves)	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Leaves (Unfolded Leaves)	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Increasing Leaf Size	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Colored Leaves	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Falling Leaves	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Open flowers	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Ripe fruits	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Recent fruit or Seed Drop	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Check when data entered online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

BROOKLYN BOTANIC GARDEN

Trees and Shrubs Deciduous (with pollen)

nature's notebook

Nickname: _____
Species: red maple
Site: _____
Year: _____
Observer: _____

Directions: Fill in the date and time in the top row and circle the appropriate letter in the columns below.
y: phenophase is occurring; n: phenophase is not occurring; ? not certain if the phenophase is occurring.
Do not circle anything if you did not check for the phenophase. In the adjacent blank, write in the appropriate measure of intensity or abundance for this phenophase.

Do you see...	Date: _____ Time: _____	Date: _____ Time: _____	Date: _____ Time: _____	Date: _____ Time: _____	Date: _____ Time: _____	Date: _____ Time: _____	Date: _____ Time: _____	Date: _____ Time: _____
Breaking leaf buds	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Leaves	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Increasing leaf size	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Colored leaves	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Falling leaves	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Flowers or flower buds	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Open flowers	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Open fruits	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Ripe fruits	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Recent fruit or seed drop	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Check when data entered online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:								

Plant Phenophase Datasheet

Taking the Pulse of Our Planet **npno**
Contact: npno@pnpg.org | Main information: www.npno.org/how-observe

Figure 31 Example of a Plant (Red Maple) Datasheet

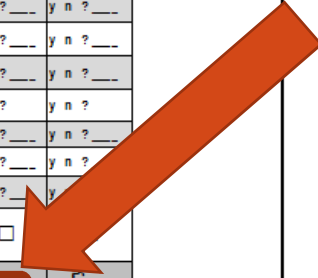


Locate the species on your collection sheet and match the **accession number** on the label with the accession number on the

data sheet

FLORA GARDEN PHENOLOGY

Native Flora Garden (Page 1 of 2)		X10210 American Be	X10176 American Be	X10177 A American Be	X10077 American Witch-hazel	20130745 A Black Gum (Tupelo)	X10256 Black Gum (Tupelo)	800049 Flowering Dogwood	X10190 Red Maple	X10137 Red Maple	X10135 Red Maple	
Observer(s): _____	Breaking Leaf Buds (Emerging leaves)	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	
_____	Leaves (Unfolded Leaves)	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	
Date: _____	Increasing Leaf Size	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	
Time Start: hr min	Colored Leaves	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	
Time End: hr min	Falling Leaves	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	
Travel Time: hr min	Open flowers	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	
Snow on ground? y n ?	Ripe fruits	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	
_____ % ground covered	Recent fruit or Seed Drop	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	
Snow in canopy? y n ?	Check when data entered online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	X10083 Red Oak	X10102 Red Oak	X10196 Red Oak	X02809 Spicebush	X10044 Spicebush	X02811 A Spicebush	X10119 Sugar Maple	X10120 Sugar Maple	X10121 A Sugar Maple	20010131 B Sugar Maple	X02713*A Cherry Birch	X10164 Cherry Birch
Breaking Leaf Buds (Emerging leaves)	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Leaves (Unfolded Leaves)	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Increasing Leaf Size	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Colored Leaves	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Falling Leaves	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Open flowers	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Ripe fruits	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Recent fruit or Seed Drop	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Check when data entered online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



BROOKLYN BOTANIC GARDEN





Colored leaves

One or more leaves (including any that have recently fallen from the plant) have turned to their late-season colors. Do not include fully dried or dead leaves that remain on the plant.

What percentage of the canopy is full with colored leaves?

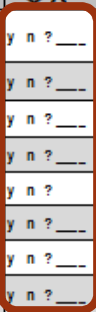
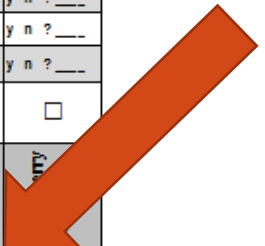
Less than 5%;5-24%;25-49%;50-74%;75-94%;95% or more



*What do you observe?
Record the **phenophase** on your data collection sheet*

CITIZEN SCIENCE: NATIVE FLORA GARDEN PHENOLOGY

Native Flora Garden (Page 1 of 2)													
		X10210 American Beech	X10176 American Beech	X10177 A American Beech	X10077 American Witch-hazel	20130745 A Black Gum (Tupelo)	X10256 Black Gum (Tupelo)	800049 Flowering Dogwood	X10190 Red Maple	X10137 Red Maple	X10135 Red Maple		
Observer(s): _____	Breaking Leaf Buds (Emerging leaves)	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
_____	Leaves (Unfolded Leaves)	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Date: _____	Increasing Leaf Size	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Time Start: hr min	Colored Leaves	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Time End: hr min	Falling Leaves	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Travel Time: hr min	Open flowers	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Snow on ground? y n ?	Ripe fruits	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
_____ % ground covered	Recent fruit or Seed Drop	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Snow in canopy? y n ?	Check when data entered online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		X10063 Red Oak	X10102 Red Oak	X10196 Red Oak	X02809 Spicebush	X10044 Spicebush	X02811 A Spicebush	X10119 Sugar Maple	X10120 Sugar Maple	X10121 A Sugar Maple	20010131 B Sugar Maple	X027138 A Cherry Birch	X10138 Cherry Birch
Breaking Leaf Buds (Emerging leaves)		y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Leaves (Unfolded Leaves)		y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Increasing Leaf Size		y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Colored Leaves		y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Falling Leaves		y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?	y n ?
Open flowers		y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Ripe fruits		y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Recent fruit or Seed Drop		y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___	y n ? ___
Check when data entered online		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



BROOKLYN BOTANIC GARDEN

Your data sheet should look like this:

	X027138* A Cherry Birch
Breaking Leaf Buds (Emerging leaves)	y <input type="radio"/> n <input type="radio"/> ? <input type="text"/>
Leaves (Unfolded Leaves)	<input type="radio"/> y <input type="radio"/> n <input type="radio"/> ? <u>95%</u>
Increasing Leaf Size	<input type="radio"/> y <input type="radio"/> n <input type="radio"/> ? <u>95%</u>
Colored Leaves	<input type="radio"/> y <input type="radio"/> n <input type="radio"/> ? <u>95%</u>
Falling Leaves	y <input type="radio"/> n <input type="radio"/> ?
Open flowers	y <input type="radio"/> n <input type="radio"/> ? <input type="text"/>
Ripe fruits	y <input type="radio"/> n <input type="radio"/> ? <input type="text"/>
Recent fruit or Seed Drop	y <input type="radio"/> n <input type="radio"/> ? <input type="text"/>
Check when data entered online	<input type="checkbox"/>



Be sure to...

- ☑ Match the accession number when available
- ☑ Circle: y n ?
- ☑ Optional: Record intensity data (ex: >95%)

Sugar Maple

Acer saccharum

Maple Family: Aceraceae

N.S. to S.D., south to Ga. and Mo.

20010131*B



Ethan M. Dropkin

RED MAPLE

ACER RUBRUM

MAPLE FAMILY; ACERACEAE

E. NORTH AMERICA

X10190





AMERICAN BEECH

FAGUS GRANDIFOLIA

BEECH FAMILY: FAGACEAE

E. NORTH AMERICA

X10210





RED OAK

QUERCUS RUBRA

BEECH FAMILY: FAGACEAE

N.E. NORTH AMERICA

X10083



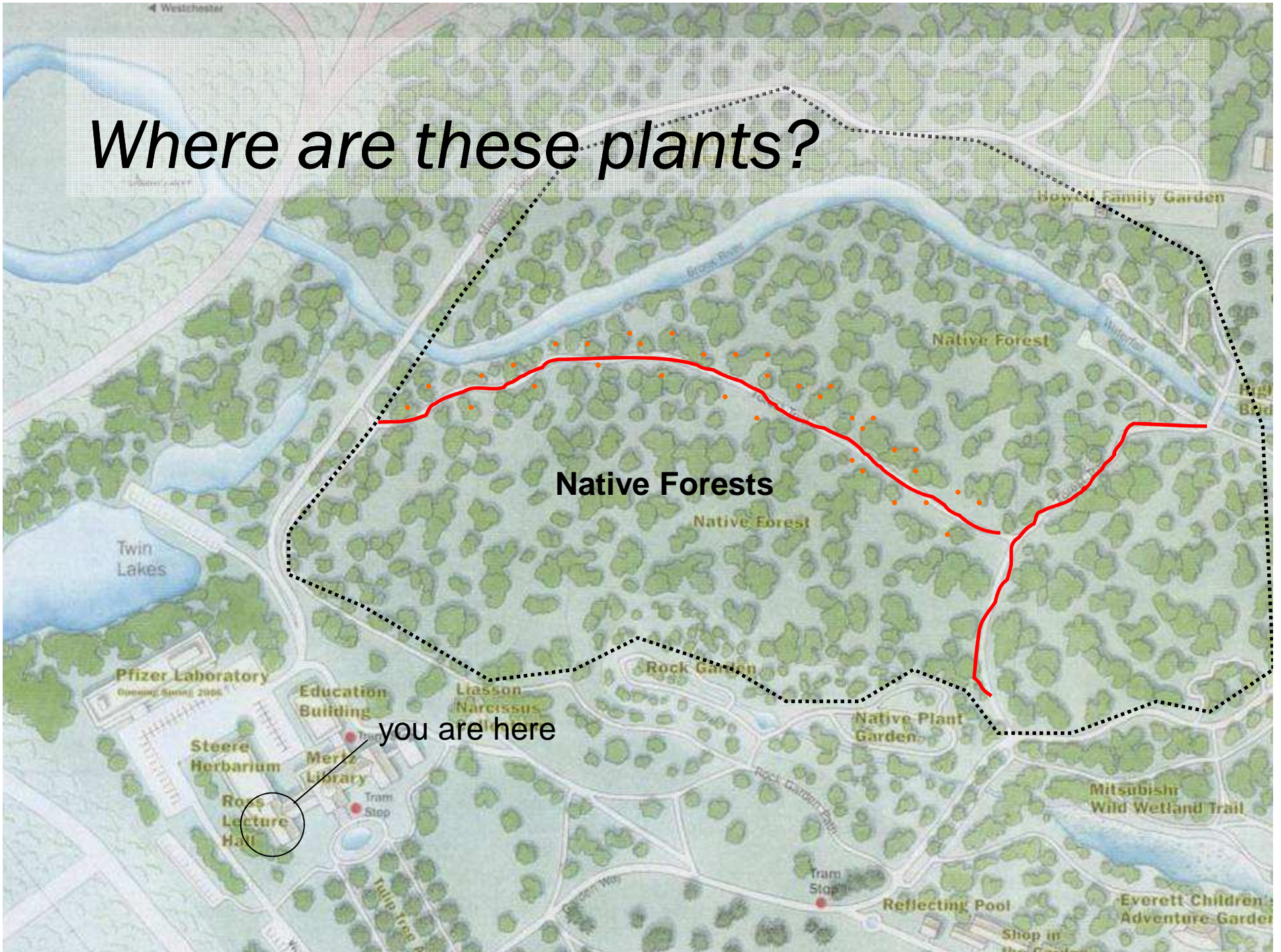
Phenology at The New York Botanical Garden

- To study the impacts of climate change on the Native Forest, The New York Botanical Garden engages volunteers in collecting important scientific data on different species of trees, shrubs, and herbs.

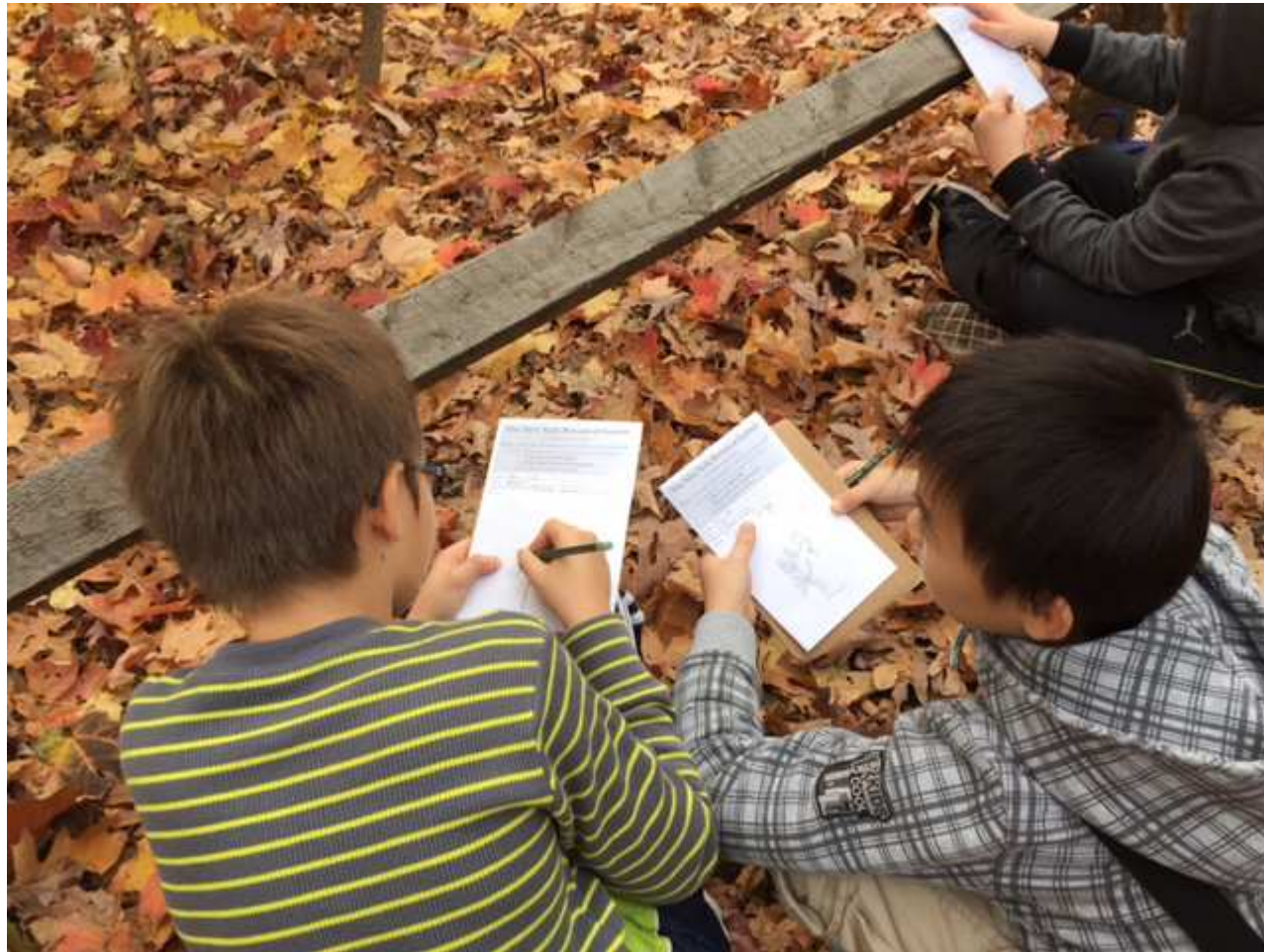
Where are these plants?

Native Forests

you are here



Phenology programs for youth at The New York Botanical Garden



Phenology at Brooklyn Botanic Garden

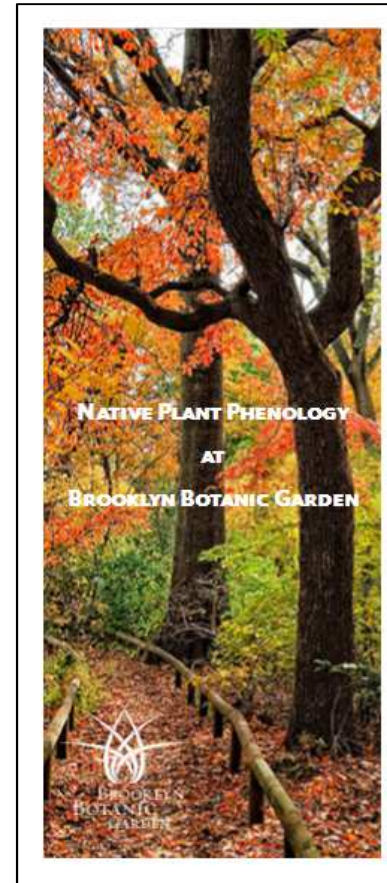
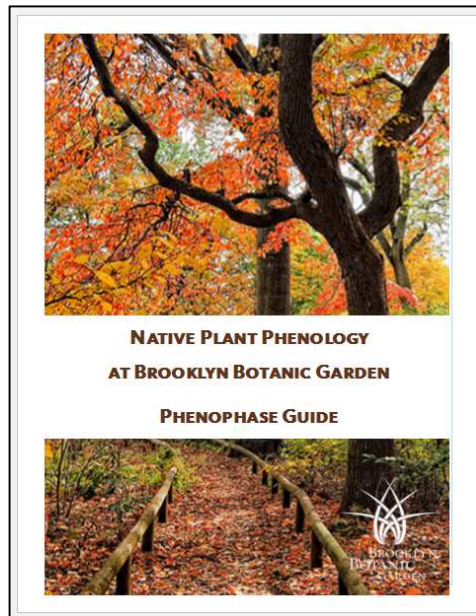
BBG Species:

- American Beech – *Fagus grandifolia*
- American Witch-hazel – *Hamamelis virginiana*
- Black Gum (Tupelo) – *Nyssa sylvatica*
- Flowering Dogwood – *Cornus florida*
- Red Maple – *Acer rubrum*
- Red Oak – *Quercus rubra*
- Spicebush – *Lindera benzoin*
- Sugar Maple – *Acer saccharum*
- Sweet Birch (Cherry Birch) – *Betula lenta*
- Sweet Gum – *Liquidambar styraciflua*
- Tulip tree – *Liriodendron tulipifera*



Phenology at Brooklyn Botanic Garden

Data Collection Materials



Phenology at Brooklyn Botanic Garden

Next Steps...

- ✓ Continue to refine materials
- ✓ Incorporate phenology lessons and activities in other Teacher Education workshops
- ✓ Introduce program to colleagues throughout the Education Department so that they can involve youth in data collection

Time for Reflection

