

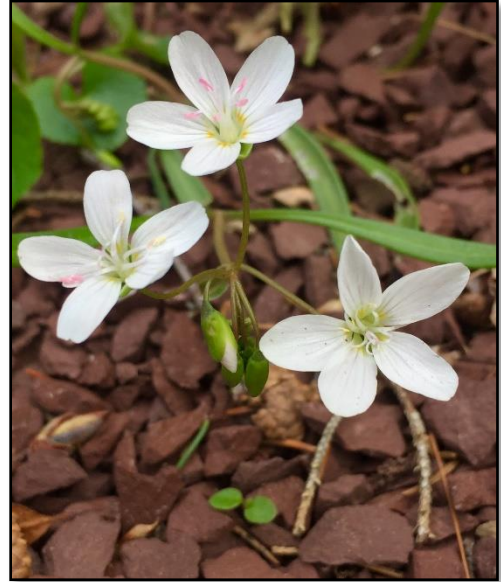


Forgotten Flowers: Spring Ephemerals

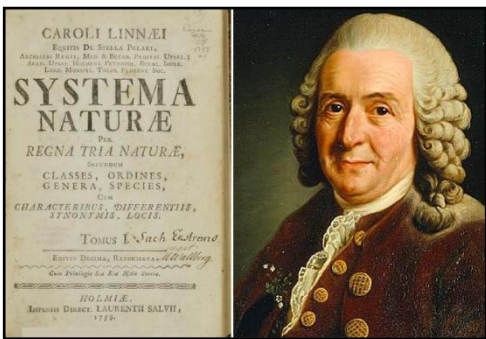
Each week, we will highlight a spring ephemeral by posting an information sheet, photos, guiding questions and enrichment activities designed for formal and informal educators, as well as lifelong learners.

Week 6: Spring Beauty

Just when you think winter will never end, up pop **the spring beauties** to make us rejoice and exclaim “hope springs eternal”. One day, the forest floor looks like a drab worn-out carpet, and the next, it’s ablaze with thousands of shining star-shaped blossoms. When left undisturbed, spring beauties grow into massive colonies. Each dainty flower in the colony has 5 pinkish-white petals, pink stamens, and pink **bee guidelines** that radiate towards the center of the **corolla** and nectary. As many as 15 blossoms can develop from a single underground tuber of *Claytonia virginica* but unlike most ephemerals, they have floppy grass-like stems and narrow leaves instead of broad leaves to catch the early spring sunlight. The flimsy structure may be nature’s way of protecting the flowers from marauding ants who would love to steal the nectar. Since they bypass the pollen to drink the sweet reward, ants do not provide pollination services to the plants. The narrow, bent stems are slippery and prevent the ants from crawling up and into the blossom.



Spring beauty has a better relationship with another insect. Its most dependable flying pollinator is the little **miner bee**, *Andrena erigeniae*. Miner bees are some of our earliest native bees to become active in the spring. They are a little smaller than a honeybee, dark-colored with pale bands on their abdomen. This solitary, ground-dwelling bee is a **pollen specialist**, meaning it collects pollen from only one or a very few plant species, in this case, only *Claytonia virginica* and *Claytonia caroliniana*, a more southern version of spring beauty. A female miner bee is often seen covered with pink pollen from the beauties which it rolls into a waxy ball inside its burrow. On top of this tiny ball of spring beauty pollen, the bee lays a single egg. When the egg hatches, the larva feeds off the pollen ball until it grows into an adult. Where spring beauties have disappeared from woodlands, so too, has this native pollinator.



Carl Linnaeus, the Swedish botanist who developed the modern system of naming and classifying plants, chose the name *Claytonia virginica* to honor John Clayton of Virginia. Clayton was the first botanical explorer to press spring beauty flowers and send them to Europe for classification and study. Native Americans knew and valued the plant long before these European botanists got involved. They used the greens as vegetables and a variety of medicines, but it was the edible tubers that made the plant such a desirable spring delicacy for them and the colonists who followed. Hence another common name is fairy spuds, for the tiny, edible tubers. The underground tubers or corms can be mashed, fried, or baked just like potatoes, but as the corm is so

small, it takes a heck of a lot of them to make a decent meal. These days, spring beauties should be enjoyed for their blooms and not their fairy spuds. Just buy or grow your own potatoes and leave the beauties alone.

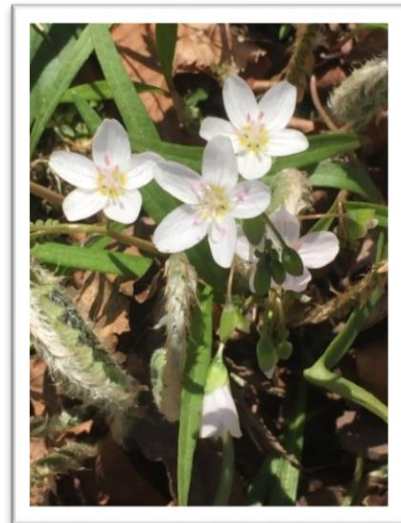
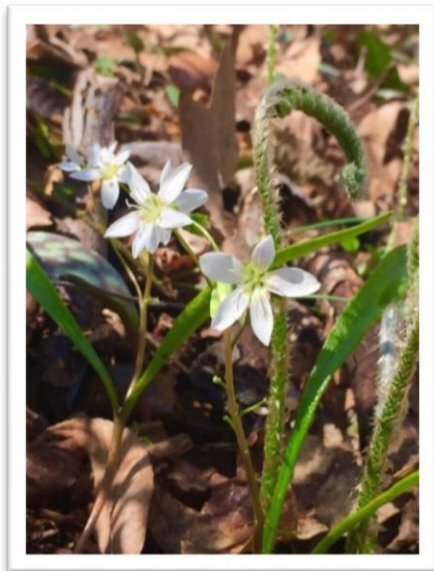
Duke Farms Connection

Spring beauties still grow in remnant populations in the woodlands at Duke Farms. You can find these tiny stars shining along the paths behind the Hay Barn and along Hay Barn Way on the way to the bike tent.

Want to grow spring beauties in your garden? Buy them from native nurseries and **never collect them from the wild!** The Native Plant Society of New Jersey is a great resource to help you find where to buy them or to get more information.

More Photos

Note: All photos courtesy of Mrs. Bird's woodland



Guiding Questions and Enrichment

1. Spring beauty has five pinkish-white petals. The five petals make up what part of the flower?

Answer: The corolla.

2. What is the function of the pink lines on the petals?

Answer: They are bee guidelines showing pollinators where to find the nectar.

3. Spring beauties have flimsy stems and narrow leaves. How does this structure benefit the plant?

Answer: It helps to keep ants from crawling up into the flowers to steal the nectar.

4. What is a pollen specialist?

Answer: An insect that only collects pollen from a specific plant and in doing so, is one of the only pollinators of that specific plant.

5. What insect is spring beauty's pollen specialist?

Answer: The miner bee.

6. What color is the pollen of spring beauty?

Answer: Pink.

7. Do miner bees form large colonies like honeybees? Where do they dwell?

Answer: No, they are solitary bees that dwell in burrows underground.

8. Where do miner bees lay their eggs?

Answer: On pollen balls in their underground burrows.

9. What is another common name for spring beauty?

Answer: Fairy spuds.

10. Why is it called this?

Answer: Because it has tiny underground tubers which can be eaten like potatoes or "spuds".

Bonus and Enrichment

I Want to "bee" Alone!

The miner bees that are important to spring beauties are solitary but, they are not the only ones! Here are a few solitary animals from near and far:

Wolverines (*Gulo gulo*) were thought to be one of the most solitary animals and are found in remote sites including boreal forests and the tundra of the northern latitudes of Asia, North America and Europe. Although recent scientific information indicates that wolverine offspring may stay with their mothers for over a year and the father may come back for visits to help raise the young.

The platypus of Australia (*Ornithorhynchus anatinus*) is semi-aquatic and spends much of its life solitary. Known for its unusual appearance, these animals are sometimes also seen in pairs. Mothers stay with their young after they hatch from an egg... this is quite unusual for a mammal!



Skunks tend to live by themselves in the summer, but they may change this behavior in the winter months where females are found to den together. The females also raise the young and may stay with them for over a year. This research was cited in *The Journal of Mammalogy*, Volume 97, Issue 5, September 2016 in the article, "Social contact and den sharing among suburban striped skunks during summer, autumn, and winter."

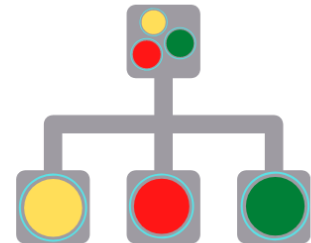
Other animals with solitary behaviors that you may want to investigate are moles, red pandas, leopards, orangutans, koalas, giant anteaters, Tasmanian devils, sloths, armadillos, giant pandas.

It's all Greek (or Latin) to me!

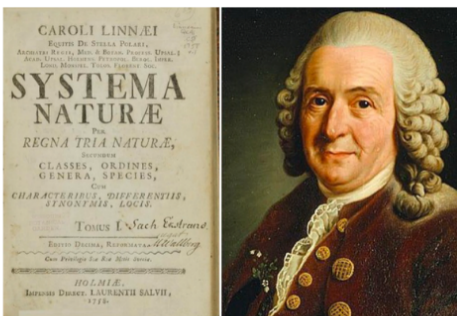
How taxonomy helps us organize our world

What?

Taxonomy is the naming system that scientists use to organize all living things into groups based on their similarities. Every organism, from the tiniest bacteria to the tallest trees, has a scientific name and is classified in this way.



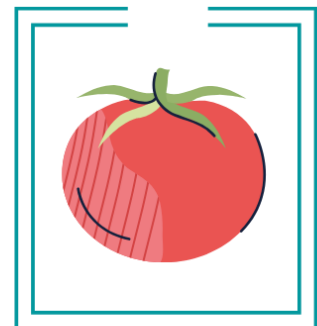
Who?



Carl Linnaeus, "the Father of Taxonomy", was a Swedish botanist who wanted to make it easier to organize and study plants and animals; while he was alive, people started traveling to new parts of the world and were discovering so many new species that the old way of labeling them was getting too confusing.

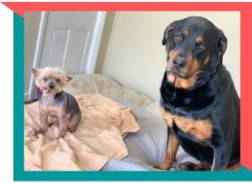
How?

Linnaeus created a two-part system that typically uses words from Latin or Greek to describe the *genus* first and *species* second. For example, before his system, the formal name in Latin for a tomato was "solanum caule inerme herbaceo, foliis pinnatis incis, racemis simplicibus"...but the much simpler taxonomic name is *Solanum lycopersicum*, which means "sun wolf peach" in English.



What's in a name?

Match the animal or plant to its taxonomic name! Then check your answers on the next page and learn more!



C

A. *Sciurus carolinensis*

Greek: "skia" - shadow + "oura" - tail

Modern: "carolinensis" - from the Carolinas



B. *Myotis lucifugus*

Greek: "Muós" - mouse + "oûs" - ear

Latin: "lux" - light + "fugere" - flee



C. *Canis lupus familiaris*

Latin: "canis" - dog

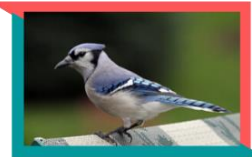
"lupus" - wolf + "familiaris" - household



D. *Cyanocitta cristata*

Greek: "kyaneos" - dark blue + "kitta" - jay

Latin: "cristata" - crested



E. *Helianthus annuus*

Greek: "helios" - sun + "anthos" - flower

"annuus" - year



F. *Lithobates clamitans*

Greek: "litho" - stone + "bates" - that walks

Latin: "clamitans" - loud calling



G. *Betula papyrifera*

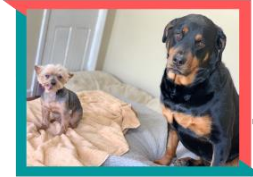
Latin: "betula" - birch

Greek: "papyrus" - paper

Latin: "fero" - carry

What's in a name?

Answer Key



C

A. *Sciurus carolinensis*

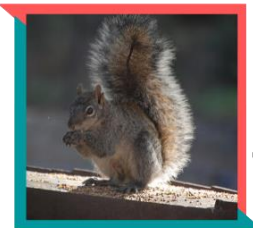
Grey Squirrel! - Did you notice the species name is not Greek or Latin? Researchers will sometimes make up names based on where the animal/plant lives, to honor other scientists, or even to make a joke!



E

B. *Myotis lucifugus*

Little Brown Bat - Early scientists commonly named animals based solely on what they looked like, so those cute mouse-like ears were an important feature in creating a descriptive name...but you may be surprised to learn that bats and mice are not related at all!



A

C. *Canis lupus familiaris*

Dog - The domesticated dog is so closely related to the wolf that it is still in the same species, *lupus*, but was organized into a subspecies: *familiaris*. Subspecies are commonly used to express tiny differences between animals/plants, such as an Eastern vs. Western population.



G

D. *Cyanocitta cristata*

Blue Jay - Ancient Greek and Latin are the building blocks of many of our modern-day languages, so you will often see changes to how they are written and pronounced, such as using "C" instead of "K", even though the word's meaning doesn't change.



D

E. *Helianthus annuus*

Common Sunflower - The sunflower is one of the earliest species to be organized by Carl Linnaeus! In 1753 he included it in his collection, *Systema Naturae*, and the original specimen is in a museum at Harvard University!



B

F. *Lithobates clamitans*

Green Frog - When naming a species, most scientists try to be descriptive of the subject, so it makes sense that the green frog's pebbled skin and iconically loud voice would be important distinctions!



F

G. *Betula papyrifera*

Paper Birch - Sometimes Greek and Latin roots can be combined in the same word to create the perfect descriptive name; "fero" can also translate to "bearing" so this tree is literally "birch paper bearing"!



Additional Resources

Spring beauty, the fairy spud

USDA Plants Database

Gardening with spring beauty

Johnson Wildflower Center

Miner bees and spring beauty

Sample Next Generation Learning Standards

- 3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, some cannot survive at all.

There are many interdisciplinary connections to this lesson. For more ideas, contact Kate Reilly, Manager of Education, Duke Farms at kreilly@dukefarms.org.