

Forgotten Flowers: Native Wildflowers

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

Week 8: May Apple

May apple or *Podophyllum peltatum* leaves pop out of the ground looking ever-so-much like folded parasols. As the soil warms and the plants grow, the green umbrellas open. Mostly they appear as single palmate leaves but occasionally, a pair of leaves emerge on the same plant. These are the bloomers.



The double leaves shield a round green bud about the size of a cherry tomato. It opens in May to reveal a large white blossom with 6 to 9 waxy petals that face downward. The scent of the flower is



unpleasantly strong and sweet, a fragrance that attracts spring pollinators like bumblebees, carpenter bees, and wasps. Interestingly, the flowers don't have any nectar, but they do have oodles of pollen to feed the growing insect colonies.

The apple part of the name refers to the egg-shaped greenish-yellow fruit which forms in August. It is sweet, edible, and appears more lemon-like than apple when ripe. But beware! Despite its use as food by Native Americans, settlers, and foragers, every part of *Podophyllum peltatum* is poisonous **except** the ripe fruit.

This is the plant's self-defense mechanism to keep the fruit intact until it matures. Then to facilitate seed dispersal, the poison dissipates so animals will readily eat the fruit and transplant the seed after it has passed through their digestive systems. Studies have shown that box turtles may be ecologically important seed dispersers. May apple seeds that have gone through the digestive tract of a turtle have a higher germination rate than seeds that were planted directly.

Despite its toxicity, Native Americans and herbalists have historically used extracts from the poisonous roots for medicinal purposes. May apple root has been used as an age old folk medicine to treat disorders of the digestive tract and liver. In the 1950's scientists researched the use of one extract, podophyllin, to treat paralysis. Today, podophyllotoxin is a compound from May apple that has been used to make modern anticancer drugs that stop cancer cell division and spread.

May apple is a large colonizer in Eastern woodlands and mostly spreads by underground rhizomes. It can reproduce from seed, especially where mammals, birds, and turtles live in the ecosystem to spread the seed. The fruit is ripe when it is soft to the touch. Seeds removed from the ripe pulp and sown in fall, have a good chance of germination in spring. It will take several years for the new plant to mature.

May apple has many other folk names including hog apple, devil's apple, poison apple, umbrella leaf, wild lemon, raccoon berry, and turtle apple, to name a few. Whatever you call them, the May umbrellas are a welcome sign of spring wherever they grow.

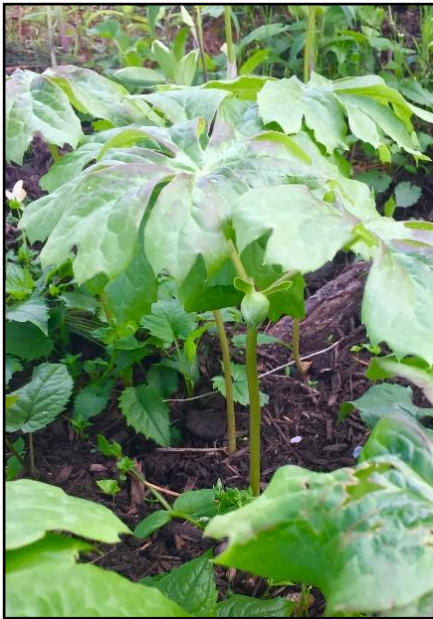
Duke Farms Connection

At Duke Farms we can find May apple growing in the Meditation Garden near the Arboretum. It's a habitat where box turtles hang out, too.

Want to grow May apple in your garden? Buy them from native nurseries and **never collect them from the wild!** [The Native Plant Society of New Jersey](http://www.nativeplantsociety.org/) is a great resource to help you find where to buy them or to get more information.

More Photos

Foliage photos courtesy of Mrs. Bird's woodland
Flower photo courtesy of Google free images



Guiding Questions and Enrichment

1. What characteristics give this plant its common name?

Answer: It blooms in May and when pollinated, produces a fruit that reminds us of an apple.

2. What do May apple leaves look like when they emerge out of the ground?

Answer: Like folded umbrellas or parasols.

3. How many leaves does a May apple have if it is going to bloom?

Answer: Two if it blooms; only one if it does not form a flower.

4. What benefit do pollinators derive from May apple flowers?

Answer: They have lots of pollen to feed insect colonies, but no nectar.

5. Only one part of the May apple is not toxic. What part of the plant is not poisonous?

Answer: Only the ripe fruit is not toxic.

6. How does this adaptation benefit the plant?

Answer: By becoming edible and non-toxic upon ripening, it prevents animals from eating it prior to being ready to disperse seeds. This encourages animals to eat the fruit when it's ripe so the seeds will be transplanted after they pass through their digestive systems.

7. What animal has a special relationship with May apple?

Answer: Box turtles.

8. Compounds derived from May apple are used medicinally today; what disease are they used to treat?

Answer: They are used to make anti-cancer drugs.

9. Where can we still find May apples growing at Duke Farms?

Answer: In the Meditation Garden near the Arboretum.

Bonus and Enrichment

Seed Dispersal Activity

Depending on the composition of grounds around your property, you might want to try a "Sock Walk" to demonstrate how seeds can be dispersed from one place to another. As with the May apple, there are many animals that potentially can be involved as "seed movers."

In this activity, participants simply place a sock over each shoe and walk. At the end of the walk, examine the socks. A fuzzy sock can capture seeds just like animal fur.

This activity can be modified for the indoors by spreading seed over a table and using a fuzzy sock on your hands to see if the seeds are picked up. For more fun, seeds can be placed in an empty and dry child's swimming pool and participants can try the "sock walk" there.

Note: It is best to try this outdoor activity in areas such as unmown lawns of grasses and uncultivated meadows, although the aspect of not finding seeds in manicured lawns can prompt a discussion about how lawns lack diversity and lend little to the organisms in the environment.

Any wild bird seed can be used for this activity but using seed from native pollinator plants will give the best results.

The activity can also be used with the topic of seeds and how their own structures facilitate movement.

Source: [Evan More Picture Perfect Science](#) by Emily Morgan and Karen Ansberry.

Literature Connections

[Plants on the Go: A Book About Seed Dispersal](#) by Eleanor B. Heady

This book shows various ways plants reproduce, including seed dispersal. The illustrations capture these movements and prompt discussions about where plants grow and why.

[Flip, Float, Fly: Seeds on the Move](#) by JoAnn Early Macken

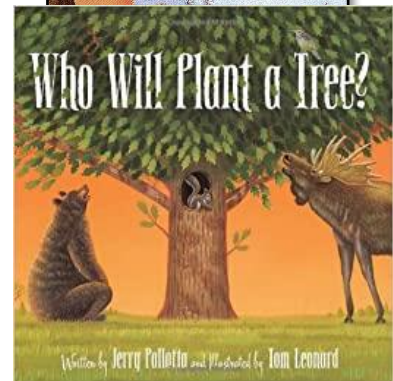
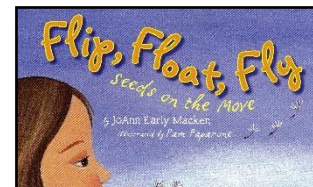
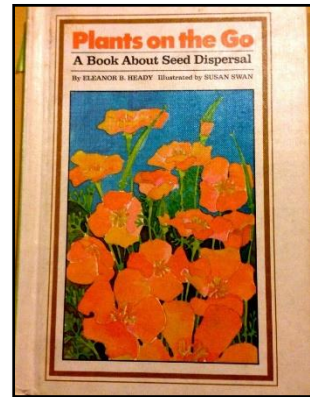
This book explores how seeds travel and where they grow. It includes seed dispersal through wind and rain and also how animals are involved.

[To hear the story aloud, this link is provided.](#)

[Who Will Plant A Tree](#) by J. Pallotta

Seed dispersal is illustrated as you meet animals such as bears, squirrels, ant, birds, and more.

[To hear the story read aloud, this link is provided.](#)



Additional Resources

- [Box turtle as agents for seed dispersal](#)
- [May apple fruit](#)
- [Johnson Wildflower Center](#)
- [USDA Plants Database](#)
- [Lots of photos of growing stages](#)
- [May apple and cancer drugs](#)

Next Generation Science 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.
 - This lesson may also be connected to a theme of how people move to various states or from one apartment or house to another. What are the basic needs of these individuals no matter where they live?

For more ideas on how this lesson can be used in a multidisciplinary fashion, contact Kate Reilly, Manager of Education, Duke Farms at kreilly@dukefarms.org.