

Backyard Explorers Club

The Backyard Explorers Club is a versatile club that investigates the wild spaces outside urban structures. We often build garden plots or use existing plant beds to explore topics such as pollination, ecosystem services and decomposition, plant succession, root structures, edible and medicinal plants, and invasive vs native plants.

Native pollinators:

Pollination is a complex and important aspect of almost all terrestrial ecosystems. Animal pollination is essential for ~80% of all species of plants on earth and insects provide the lion's share of this. Honeybees are wonderful creatures but can often lead the public to underappreciate the native pollinators in our area, without whom our ecosystem would collapse! This program walks students through the importance of pollination during a 15 week course held once per week for 1.5 hours. During this time, students learn about the different types of animal mediated pollination, the importance of diversity in a garden setting for the health of pollinator communities, the different types of pollinators that are commonly seen in this area, and the general ecology and biology of different pollinators. In addition to this, students construct or utilize a pollinator garden under the supervision of an entomologist and plant a wide variety of pollinator friendly plants that they will then monitor throughout the course. Monitoring will consist of weekly data collection where students are counting the number and type of pollinators found in various plots at various times.



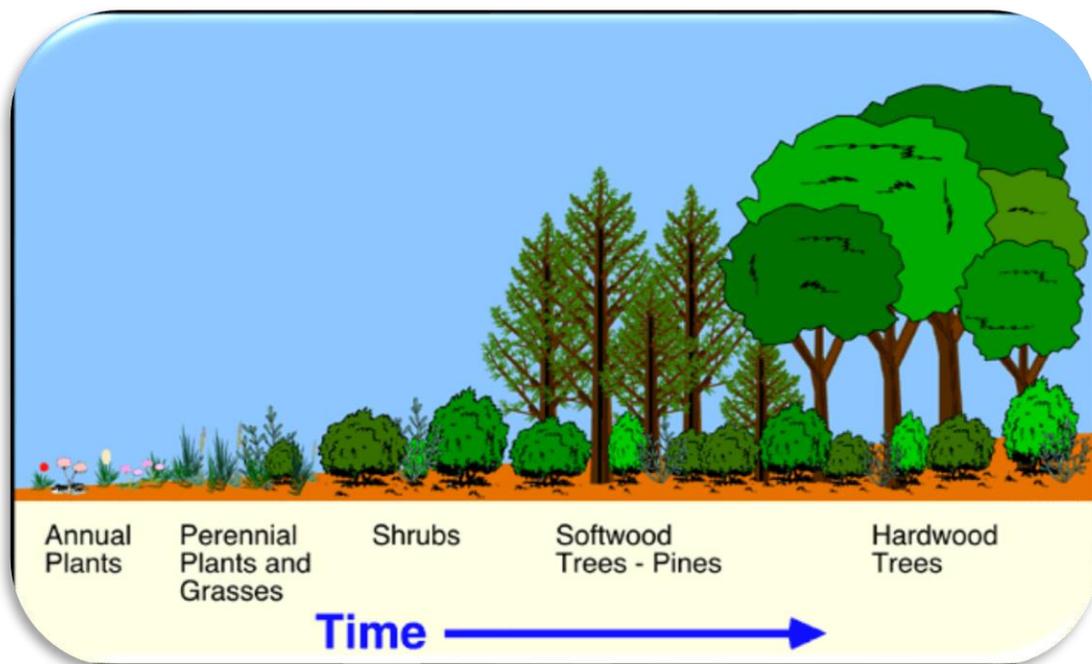
Ecosystem services and decomposition:

Many of the functions we rely on in agricultural and natural areas are provided free of charge by the organisms that live there. We call these ecosystem services and they include but are not limited to pollination services, decomposition, nutrient cycling, and water purification. This program explores the different factors that impact the decomposition of large log sections. Students work with the educators to pick 6 different factors such as partially buried, full sun, and enclosed in plastic. They then monitor the rate of decomposition and collect data on the insect community associated with each of the logs and the decay colonization rate of the outer surface by fungi. This project takes 4 sessions to completely install and then would be monitored once each April, May, June, July, September, and October over the next several years.



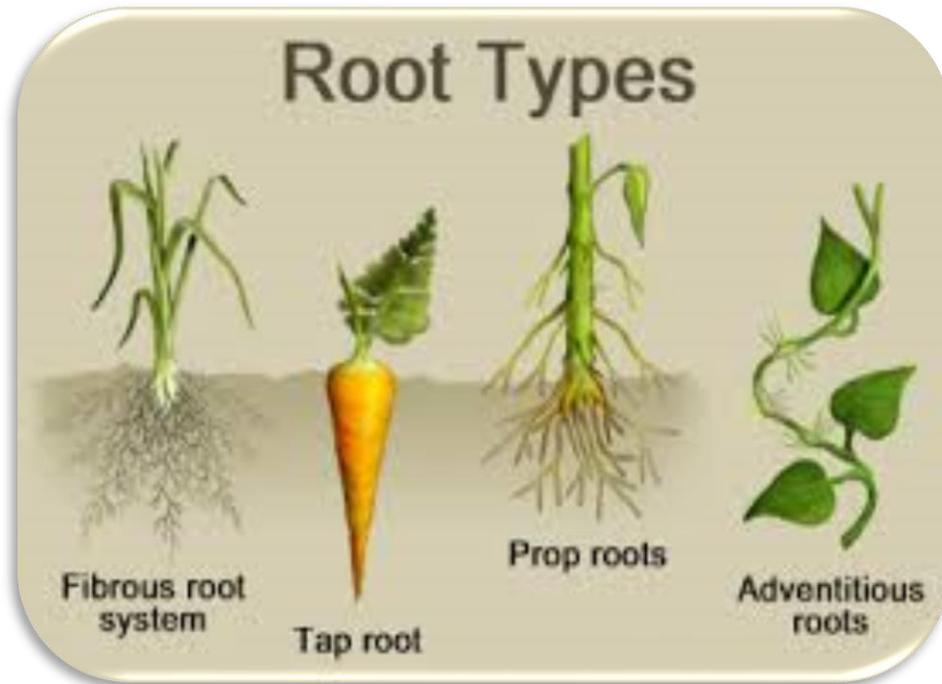
Plant succession:

Succession is the process by which life naturally colonizes an area. Primary succession is only seen on earth now when volcanoes deposit virgin land and the surrounding organism communities slowly take it over. Secondary succession is more common though and can be demonstrated in the school yard. Secondary succession is when some disturbance occurs which clears a portion of land and then the surrounding organism community retakes that area. The major difference is there is already soil present in secondary succession. To demonstrate this, students construct three identical plots which are then each "started" one year apart. The goal is to show how different plant communities naturally arrive at different times. The students start by marking the outline of each plot and building a perimeter. They then clear away any existing plants inside the plots and solarize the area to ensure that any leftover viable seeds are killed in their plots. At this point they have a clean plot which will almost immediately begin to be recolonized by other plants. During year two they repeat this procedure but only with 2 of the plots. In year three they do this with just one of the plots. No planting is needed for this area. The plants will naturally come back and colonize the space. The students will observe, and record as different plants recolonize the plots. They will see that the communities are very different between years and that they can use older plots to predict what will happen to the new plots. This would take 4 sessions to set up and then would be monitored once per month each month school was in session (this can be done during the winter as well).



Root structures:

When students are asked to draw a “plant” they will often envision a leafy tree or shrub protruding from the ground. In short, the root system of plants does not always get the attention it deserves as these organisms are the functional foundation of all terrestrial food webs. Plant roots are highly diverse and beautiful structures and this exhibit plot would explore the complexity of various model type plants. Students clear and prepare a garden plot then plant and care for plants that utilize the four main root systems types: tap roots, fibrous roots, prop roots, and adventitious roots. After the plants have grown for a period of time, the students would then excavate the roots and carefully clear the soil away to expose the structure of the beneath-ground portion of these organisms. They will be shocked at just how much bio-mass is there! This takes 4 sessions to set up and then needs unmonitored care until the decision to excavate is made.



Edible and medicinal plants:

This would be an area that students would pick plants to work with and use later on in the year (for instance they may choose to bake cookies with some of the spices they grow here and enjoy them with some iced tea made from garden plants as well). After they had chosen the plants, they would create signage to teach others about the helpful properties that many plants in the area have. Students create a new garden plot over the course of 4 sessions and then monitor the plants for insect pest and weed species on a bi-weekly basis. At the end of the year, students would harvest their crops and use the edible plants in the refreshments present at the annual summary presentation on all the garden plot experiments for parents and other interested parties. Plants to be used would include mint for tea, various spices for potpourri, and fast-growing plants used in salsa like tomatoes and onions.



Invasive vs native plants:

Not all non-native species are invasive. And not all invasive species are non-native. A species becomes invasive when ambient natural forces are no longer able to keep the population in balance with the ecological community around it. Sometimes a native plant species will become invasive when a key herbivore is extirpated or excess nutrients suddenly become available. More commonly, a non-native plant species will become invasive when it establishes in an area that has a comparable climate to the native range but which lacks the natural herbivores which keep the plant from growing unchecked. Students will explore the differences between several common native and invasive plant species by planting them next to one another and collecting data on how they grow and spread. They will start by constructing a new garden plot over 4 sessions and then planting both native and invasive vine, shrub, and grass species. At the end of the trial period in July, all the invasive plants would be removed for the year.

