North Pond Restoration: Plants Filter Water

How Can Plants Clean the Water?

As a part of the Lincoln Park Conservancy's work to improve the North Pond Nature Sanctuary our goal is to make the pond sustainable: that includes thinking about how plants on the shore can clean storm water before it enters the Pond (learn more about the project at http://lincolnparkconservancy.org/the-campaign-for-north-pond/)

Rainwater is great for freshening the air, keeping trees and other plants healthy, and cleaning rooftops and sidewalks. But if it enters the Pond directly, it can carry a lot of dirt and pollutants with it. In addition to pollutants, rainwater can wash loose soil into the pond, making the water dirty and filling it in. Plants, both upland from the pond and along the shore, filter all those contaminants out of the water before it enters the pond.

Materials:

Three to six plastic soda bottles, cups, or other clear containers for planting; soil (potting soil or from the yard); wood chips, mulch, or leaf material; grass or other small plants (petunias work well); water (pond water or tap water with "contaminant" – contaminants can be a little bit of soil, food coloring, cooking oil, detergent, etc.); string; hole punch; pitcher of water. Optional: board large enough to hold three bottles.

Guiding Questions: Can plants help keep the pond clean? How do you think they do that? Why are plants, even those far from the pond, important to the pond's health? Can plants remove all kinds of pollutants? How could we test this idea?

Directions:

- Cut three bottles lengthwise so that they can become planters: cut about a quarter of the side out of each bottle, leaving both the top spout and bottom intact. You may want to glue them to a board to hold them in pace.
    - Note: you could also cut a two-liter style bottle in half and put the top half inside the bottom half. If you do this, you may need to put a screen or small bit of cheese cloth over the mouth of the bottle so that the soil stays in the bottle. This will slow down the experiment and creates an additional filter for the water.
- Put the same amount of soil in each container.
- Leave the first container as it is. Cover the soil in one container with wood chips, mulch, dead leaves or other plant material. Plant grass, petunias, or other quick growing plants in the third container.
- Cut the other three bottles in half to create cups that will collect drainage water. Punch holes in the "cups" at the top and run string through the holes. Hang the cups over the neck of the planters.
- Pour the same amount of tap water, at the same rate, into each of the planters.

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- When the water overflows into the clear collection cups, observe the differences.
    - Which of the three is the best at filtering the water?
    - What is happening as the water moves through the soil?
    - If we want the pond water to be clean, which type of soil or vegetation should surround it?
    - Why are plants, even those far from the pond, important to the pond's health?
    - What would make the plants more efficient at removing pollutants? Can they remove all kinds of pollutants?
- To continue exploring, create dirty water by mixing a little bit of soil (or some of your other contaminants) into your pitcher. Pour the water again, making sure to pour the same amount of water at the same rate into the containers.
    - What's different this time vs last time?
    - Which container is the best at filtering the water?
- This activity demonstrates how plants can help the Pond. You can help by creating a rain garden in your yard or at the bottom of your rain downspout that can take advantage of and filter that water. To learn more about making a Rain Garden,
    - https://extension.umn.edu/landscape-design/rain-gardens
    - https://thewatershed.org/create-a-mini-raingarden/
- Alternatively, take advantage of plants ability to filter water and create a vertical garden out of recycled water or soda bottles that you can use inside your house all winter.
    - https://www.instructables.com/id/Soda-Bottle-Vertical-Garden-for-Indoors-or-Out/

Explore more about plants filtering water:

http://gardenreboot.blogspot.com/2013/10/plant-water-filteration-experiment.html
https://www.ealt.ca/kids-blog/water-filtration
https://www.epbrparkscouncil.org/wetlands-filter/
https://www.waterfiltersfast.com/Fun-Water-Filtration-Pollution-Science-Experiments-for-Kids_b_89.html
https://www.agua.org.mx/wp-content/uploads/2018/01/activity_grades_4-8_plantsinwaterfiltration.pdf
https://www.epbrparkscouncil.org/wetlands-filter/
https://slideplayer.com/slide/10686615/
https://www.homesciencetools.com/article/water-filtration-science-project/
https://www.youtube.com/watch?v=im4HVXMGI68

https://www.mrwatergeek.com/plants-that-filter-water/

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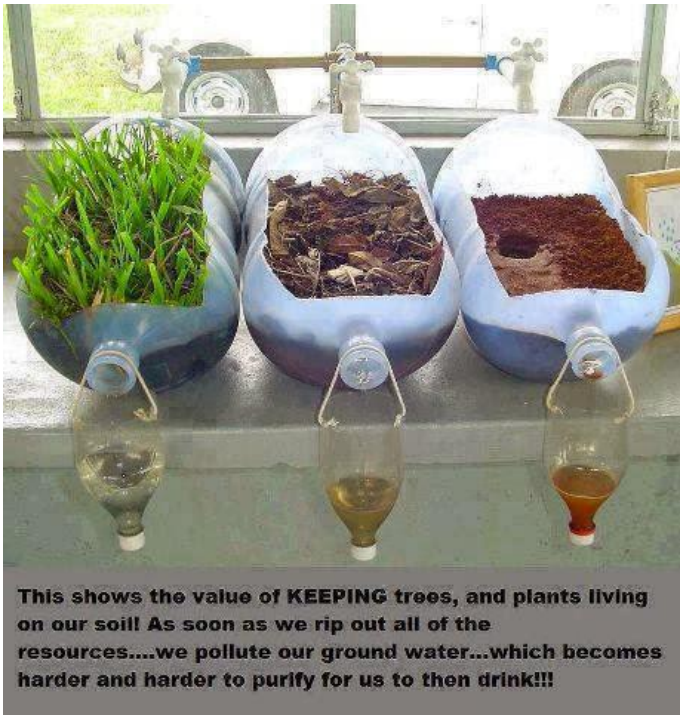
Water Filtration and Erosion Images from the Web



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