



Grey is OK!

This activity is part of the Water Conservation theme.

What's the purpose of this activity?

This activity teaches water conservation and that there are alternatives to sending all household water to a municipal wastewater facility or building expensive septic systems.

Key Messages:

- Raise awareness in students that there are alternatives to treating water
- Learn the role that wetland plants play in purification of water
- Understanding the impracticality of using water treated for drinking to flush you toilet.

Materials:

- Home and greenhouse model with pump
- Watering can with spout and water source (large barrel)

- Extension cord
- Laminated coloured photos of aquatic plants used for water treatment.

What will I be doing?

You will be trying to raise the awareness of the students of alternative ways to treat out wastewater in the home helping them make links to the role of wetlands play in our environment. The best way to do this is the engage them with questions and work off their answers.

To begin with you might want to ask you student group to label 5 ways you use water in the house. Ask them if they know the difference between grey water and brown water.

Help them understand the difference. ***Ask the students if they know where the water goes after they shower, brush their teeth or go to the toilet in their house.***

Because grey water makes up the majority of the water waste out of the house, it makes sense to try to treat it nearby and reuse it in the toilet. It really makes no sense to be flushing water from the toilet which

has been treated to drink.

Ask the students why it is not practical to flush drinking water down your toilet

The water purification process, especially in waste water plants is expensive and takes a lot of energy and chemicals to clean. What we have learned from nature is the wetlands fulfill this same role. Wetlands also act as sponges holding water during spring runoff and after storms slowly releasing water back to the water table. They also have a role in cleaning this water as many plants that live in wetlands are able to uptake heavy metals, phosphates and other impurities in water. By knowing this we can take advantage of these properties and use them to treat our own water with the use of chemicals and expensive piping systems and septic beds.

Ask the students what might be an alternative to all soapy, dirty grey water being sent to a treatment plant.

Why not clean it the way nature cleans water. Describe the model outlining some other different ways we use water in the house. Indicate how gravity can move water to the treatment area and a pump is needed to send it back into the toilet. Talk about the greenhouse and how it can be used to grow plants year around which can then be watered by the grey water treated by the aquatic plants.

Ask the students that after the plants clean the water, what else could it be used for?

Watering plants and grass, cleaning the car are other possible uses as well as almost every other household

use other than drinking. With more filtering and cleaning, the water could be rendered potable.

Does the group know any common marsh plants?

Cattail is a common plant that helps purify water and can be used in alternative water treatment. Often people call this plant bulrush which is a completely different plant. Blue flag iris, Elephant ear, Umbrella Palm and Soft Rush are examples of plants that have been tested for their ability to uptake impurities in water. They all live in aquatic environments. Show them the colour photos of these plants.

Ask for a volunteer. Have the student pour some water into the various receptacles in the model house i.e. bathtub, upstairs sink and kitchen sink, being careful not to overflow them. The water will gravity feed into the Settling Tank eventually flowing into simulated wetland and then in to the holding tank where it can be pumped out for watering greenhouse plants and toilet use. Plug in the pump to demonstrate a simplified model of how the system works. Observe the water come out of the toilet hose out the back of the model which goes off to a municipal treatment plant or septic bed.

Any final questions?

To prepare for the next group, take out a couple of cups of water out of the settling or holding tank so the next group can see the process better.

Background Information

Grey water is soapy, dirty water used for such purposes as shower and

sink use, washing dishes, etc. Brown water is water with feces in it and other hazardous bacteria. The treatment of our household water is expensive and requires the need of lots of energy and chemicals in the case of municipal wastewater facilities. An alternative is to treat the grey water right near the home. Using a good diversity of aquatic plants and sediment in water treatment tanks, the resulting water can be purified enough to be used for non-drinking household uses. Some plants identified for this purpose are Blue Flag Iris, Elephant Ear, Umbrella Palm and Soft Rush. All these plants live in water environments and are known to have purifying qualities to them. See laminated plant photos for more information of the above plants.

Clean Up procedures:

1. Empty all receptacles of water
2. Move all removable parts and place in container provided
3. Wrap up pump cord and place pump away with other removable parts.