

Septic Sights



This activity is part of the **Water Technology** theme

What's the purpose of this activity?

Students will use a hands-on model to trace the path of rural household waste from its source (toilet, sink, shower, etc.) to its place of disposal.

Key Messages:

- Water is a limited resource that is essential to life
- Waste water must be treated or cleaned so that it can be re-used
- A septic system is one way to clean waste water

Materials

- Table top model
- 2 water capturing containers
 - 1 to pour the "waste water" into the funnel
 - 1 to capture the water after the weeping bed
- Toilet paper
- Budgie sand

What will I be doing?

You will be supervising the operation of the model and posing and answering questions about the septic system.

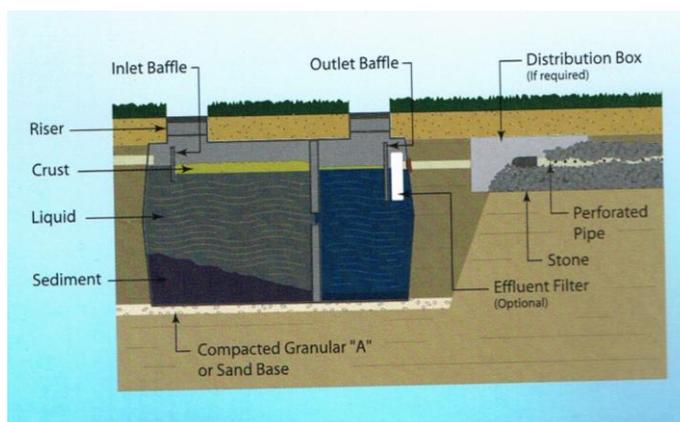
Q: Does anybody here know what a septic system is?

A: It is a system of treating wastewater by filtering it through certain types of gravel and earth materials that are build up in layers underneath the ground.

Q: Does anybody here know if their home for cottage has a septic system?

A: We are going to see how a septic system works. Allow one, or a few student(s) to pour the "waste water" into the funnel (this represents a toilet, sink, shower, etc.) and have them watch how the solids settle within

the septic tanks. As they are watching the water move through the system, explain about the various parts of a septic system.



Septic Tank:

The septic tank is made up of two chambers. The first chamber is about two thirds of the tank. This chamber settles most of the large waste solids and floats the soap and fat. The second chamber assures further settlement of the finer solids. The anaerobic bacteria, which do not require oxygen, treat this settled waste over a long time period (several months).

When the waste solids in the first chamber build up close to the opening entering the second chamber, the septic tank is pumped out. Pumping of septic tanks usually occurs every few years if used properly.

Septic/Weeping Bed (Secondary Treatment):

This treatment consists of a network of perforated pipes installed in trenches surrounded by small stones (gravel), called the septic bed or weeping bed. Here the aerobic bacteria, bacteria which do require oxygen to live, treat the effluent (the liquid coming out) from the septic tank. The treated effluent then filters through the bacteria covered stones into the earth below and is used by the grass in the lawn above, or evaporates. The grass area must be allowed to breathe for the bacteria to work efficiently.

Explain that wells near the system can be contaminated from malfunctioning or overloaded

septic systems. This is the same groundwater that the people who live in the house would be drinking and washing with.

Q: Why do we want to avoid mixing the water and wastes from the septic system with the groundwater that the people who live here would use for drinking and washing?

A: People can get very sick from the bacteria that contaminates/pollutes the water they use for drinking and washing.

Q: If the water is polluted, is it only a problem for humans?

A: No, plants and animals cannot use it either. It damages their habitat too.

Ask the students what kinds of things would be inappropriate to flush down the toilet and why. (See Do's and Don'ts)

Do's and Don'ts for your Septic:

- Conserve water to allow your system to treat waste efficiently. The less you pour, drain or flush into it, the better your system will perform. The more time your system has to work on each litre of waste, the more efficiently each litre of wastewater will be treated.
- When you disturb the natural balance of what goes into your septic tank, or misuse or overwork your septic system, problems can arise. *If something doesn't break down naturally, it shouldn't go into a septic tank!*
- The following are a few pointers to help you avoid future difficulties:
 1. Avoid putting grease down the drain. Septic systems can be damaged by oils, grease and fat. Dispose of these with garbage.
 2. Chemicals such as paints, solvents, bleach or strong cleaning agents, should not be washed down the drain. They will hamper the growth of the natural bacteria your septic system needs to do a proper job.
 3. Diapers, paper towels, feminine hygiene products or Kleenex shouldn't be flushed into your septic system. Also, be conservative with the amount of toilet paper you use.
 4. Wisely use septic tank starters and related products in your septic system.
 5. Don't allow your septic system to freeze because the bacteria need to be warm to work! Insulating the top of your tank with polystyrene can help keep it warm and

work more efficiently in cold weather.

6. Do not drive cars, snowmobiles or heavy machinery over your weeping bed. The tank and surrounding pipes can be damaged by excessive weight and packing of snow over the weeping bed can allow for frost to penetrate.
7. Don't plant trees and shrubs on or near the septic system because the deep roots of these can plug or damage the system's pipes.
8. The drainage area around your system is also very important! Ground water and runoff from roofs, patios and driveways should be directed away from the septic system.

Background Information

- Human sewage is disposed of through septic systems in most rural areas.
- When maintained properly, septic systems can be very efficient disposal systems.
- The septic system actually biodegrades (breaks down) household waste into harmless substances with the use of bacteria and other micro organisms therefore the sewage and waste water is NOT just being dumped into a hole in the ground.
- Septic tanks can seep nitrogen into the ground and water if poorly maintained. Too much nitrogen stimulates heavy growths of algae in lakes and may kill aquatic plants and fish.

Clean Up procedures

- Properly drain the model and pack all the containers, toilet paper (making sure it stays dry), and any other accessories with the model.

