A Down-to-Earth Water Filter

Have you ever wondered how water is cleaned before it reaches your home? How about making a simple water filtration system that will answer many questions? Remember, though, that however good a job you think you have done, the water from this experiment should never be drunk. The experiment will give you a good idea how water filters work, but it is still not a real water treatment plant, and just a few drops of "bad" water can make you sick.

It will be best to do this experiment outside since it can be messy and the dirt you need to use should be easy to find nearby. Clean sand and gravel are available in small bags in a garden or variety store.

**What to do:** Place the filter or a piece of paper towel in the bottom of the pot or carton. Fill the bottom of the pot with gravel or small stones to a depth of about 2 inches (5 cm). Pour sand into the container until it is about three-quarters full. This is your filter system.

Using the funnel, pour about 1 cup of dirt into the soda bottle and fill it with water. Screw the cap on and shake it thoroughly.

Pour some of the muddy water from the bottle into one of the shallow containers. This will be the control or test container, to compare the filtered water against the original sample. Place your filter system in the other container and pour some muddy water into the top of it. Watch the water as it filters through and compare it to the control sample. Be patient, the first samples will not be as clear as later ones. Repeat this procedure several times until the water comes through fairly clear. Continue to compare these samples with the water in the control pan.

**What happens:** The first water that trickles out of your filter system will still be fairly dirty. However, as you continue to pour the water back into and through your system, it begins to get clearer. Although the water gets cleaner, there will likely still be a certain amount of sediment that remains.

**Why:** Although there are similarities, your simple water filter system is not like a city’s large water treatment plant. In the city system, water is sprayed into the air to release unwanted gases, and substances are added to clump together dirt particles suspended in the water so that they can be filtered out.

As with your system, the water is also passed through layers of sand and gravel, but also through a layer of charcoal. The water is then chlorinated. The chlorine gas kills bacteria that may be present in the water.

**YOU NEED**
- medium-sized flowerpot, or a cut down waxed carton with holes punched in the bottom
- coffee filter or paper towel
- large soda bottle with cap
- Two shallow trays
- gravel or pebbles
- sand
- dirt
- water