CONTAMINATED AQUIFER

Purpose

1 ***To see how easy it is to contaminate an aquifer and how difficult it is to clean it.***
2 ***To see if grain size affects ease of cleaning the aquifer.***

Instructions

The contaminant we shall use is food colouring. All samples should be labelled immediately they are collected. The sand in the tube represents an aquifer.

1. ***Ensure that the sand is damp by pouring in some water and letting it drain away.***

2. ***Pour in 50ml of clean water.***

3. ***Keep a sample of the clean water after it has passed through the sand to compare with the contaminated water.***

4. ***Pour 1ml of the contaminant into the tube.***

5. ***Pour in 50ml of clean water.***

6. ***Collect the fluid in a 100ml beaker.***

7. ***When most of the fluid had drained out replace the beaker and pour the contents into a boiling tube and label it.***

8. ***Repeat activities 5, 6 and 7 until the water is clean. Check by looking down through the last sample and the sample of clean water***

9. ***Comment on what you have found.***

10. ***Repeat on a tube with different sized sand.***

Teacher's Section

Requirements
50ml measuring cylinder
Food colouring
3 Tubes each filled with a different sized sand and each with gauze to stop the sand escaping. The tubes can be made from 100ml plastic measuring cylinders with the base cut off and gauze stuck on to one end with araldite.
Suitable sizes for the sand 1 to 2mm, $\frac{1}{2}$ to 1mm, and $\frac{1}{4}$ to $\frac{1}{2}$ mm
Retort stands and clamps to support tubes.
100ml beakers or clear plastic cups
Boiling tubes to save samples in

Notes
Usually at least 1000ml of water needs to be poured in before the water becomes indistinguishable from clean water. If you really want to show how difficult it is to clean an aquifer you can also try using fluorocene which shows up even when very dilute. I have used 1ml of fluorocene powder dissolved in 5ml of water as the pollutant. Even after 200 litres of clean water had flowed through there was still a faint greenish yellow tinge.

Time
30 to 40 minutes per tube (The finer grain size takes longer).