

## Water Treatment

### Topics covered

This topic can be used on its own or as a continuation from the Water Cycle. You could also link it to Wildlife in streams so pupils learn the effects of pollution on stream wildlife.

Water treatment covers:

- Why do we need to clean our water?
- Diseases carried by unclean water
- Pollution and waste
- Cleaning water
- Storing water
- Cleaning sewage

### Objectives

- Communicate importance of clean water and how we shouldn't take this for granted
- Get pupils to think about why rivers are polluted and how water is treated
- Discuss waterborne diseases

### Learning outcomes

- Understand why water needs to be cleaned
- Appreciate that many people in other countries do not have clean water
- Identify main processes in treating water and sewage
- Appreciate importance of not polluting our drains

### Activities

- Spillage scenario

### Suggested approach

#### Cleaning water

Get pupils to think about the need for cleaning water. There is water all around us - but we could be ill if we drank it.

**Question:** Why is it not safe to drink rainwater?

**Answer:** Dirt, dust from the air, acid rain, run off buildings, soil etc.

**Question:** Why is it not safe to drink water from streams?

**Answer:** Chemicals in run-off from fields, industrial pollution, natural organic pollution, dead animals.

Show some dirty water...

**Question:** How could you clean it?

**Answer:** Chemical flocculation, settling, aeration, filtration, disinfection.

### **Cleaning sewage**

**Question:** Where does the water in our drains come from?

**Answer:** Industry, our homes, rainwater.

**Question:** What do you think needs to be removed from the water in the drains?

**Answer:** Chemicals, soil and debris, sewage.

### **Make a settling tank:**

- put some soil into a jar of water
- stir and leave to settle
- you will see layers of fine particles at the top and coarse particles at the bottom.

### **Investigate filtration properties of different materials:**

- In a jar, put water with soil, twigs, litter, oil etc
- Cut the top off a large plastic bottle, just above the middle. Turn the top half upside down and place on bottom half to make a funnel
- Place a filter paper in filter and pour on some of the water mixture
- Experiment with filtering the water mixture through different materials, for example
  - sand
  - gravel
  - barbecue charcoal
  - cotton wool
- Note what happens and discuss
- Write method, results and conclusion. Draw diagram.

### **History**

Water treatment in history:

The Romans had excellent water facilities - Roman baths, plumbing, sewers.

Impact of clean water supplies and good sewage systems on the spread of waterborne diseases.

How did plumbing get its name? Why do we no longer make water pipes out of lead?

### **Useful resources**

Wessex Water for sewage treatment <http://www.wessexwater.co.uk>

WaterAid <http://www.wateraid.org.uk>

Eco schools <http://www.eco-schools.org.uk>

Environment Agency <http://www.environment-agency.gov.uk>