

When you flush the toilet or pull a plug out, the water disappears. Do you know where it goes?

Every day Anglian Water collects more than 960 million litres of wastewater from around 5.5 million customers.

How we treat wastewater

Once you flush the toilet or let water go down the plughole, it enters a network of pipes and pumps which leads to a wastewater treatment works. This is also called a sewage treatment works. Here it is treated before it is returned to our rivers and seas. In some areas, houses which are not connected to the **sewers** have septic tanks for their wastewater. The tank is buried underground and has to be emptied by special lorries.



↑ One of our 1,106 wastewater treatment works

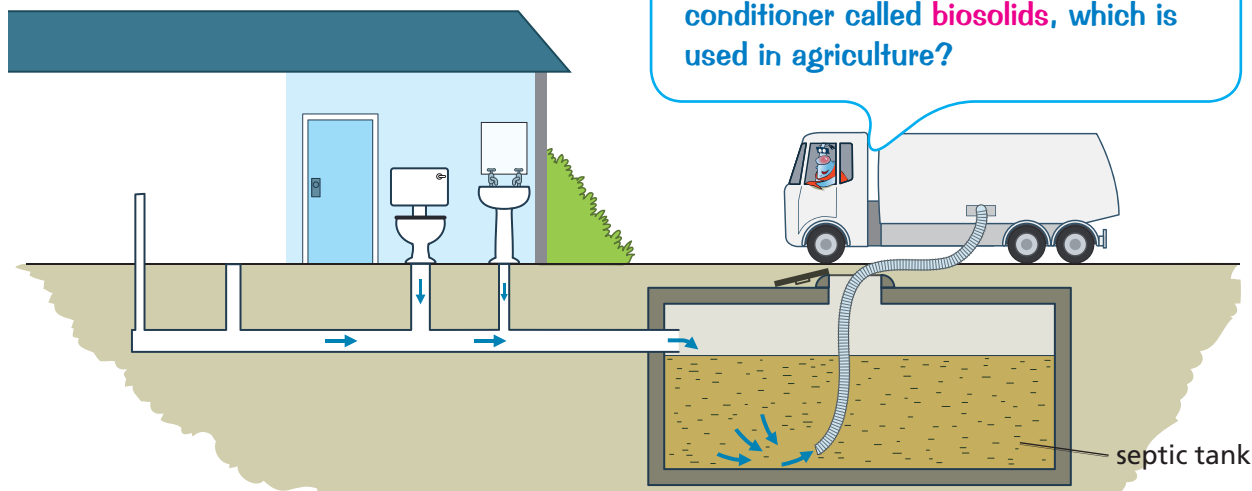
Why do we treat wastewater?

We need to remove some of the ingredients in wastewater that might harm the environment by polluting the rivers and the sea.

How do we do it?

The wastewater treatment process is done in four main stages. Follow the diagram overleaf to find out more.

Did you know that when we treat wastewater we create a soil conditioner called **biosolids**, which is used in agriculture?



Wastewater treatment

1 Preliminary treatment
Screening removes wood, paper, rags and plastic for disposal at landfill sites.

3 Primary treatment
Settlement tank
Most of the solids sink to the bottom of the tank as sludge. This is treated separately.

4 Secondary treatment
Biological filter
The sewage is trickled onto beds of stone, where micro-organisms feed on the bacteria.

6 Tertiary treatment
The liquid may be filtered again using reed beds, or filters or grass plots, or disinfected with ultra-violet light to kill bacteria.

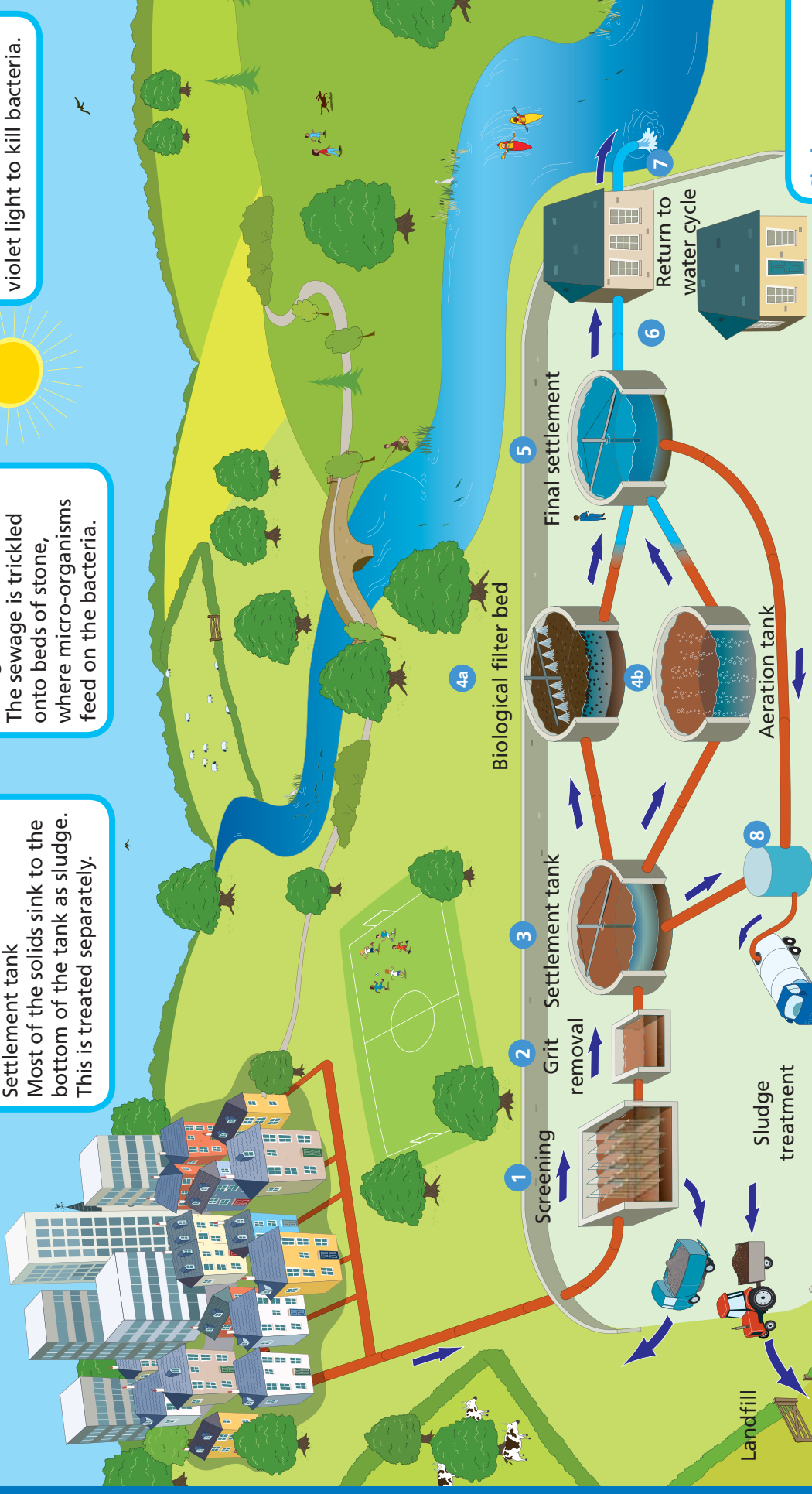
2 Grit removal
Gravity causes the grit and sand to fall to the bottom. This then goes to landfill.

4 Secondary treatment
Aeration tank
Air bubbles are blown into tanks of sewage, where floating micro-organisms feed on the bacteria.

5 Tertiary treatment
Final settlement
Remaining bits of dirt sink to the bottom. Clean water flows off the top.

7
The treated wastewater called effluent is returned to the natural water cycle.

8 Sludge treatment
The sludge is taken to treatment centres, where it is turned into a soil fertiliser called biosolids.





See if you can create your own filter to turn muddy water back into clean water again. You can use different materials to see how good they are at filtering the water.

Safety warning

You may need to ask for the permission or the help of an adult to cut the plastic bottle up.

What to do

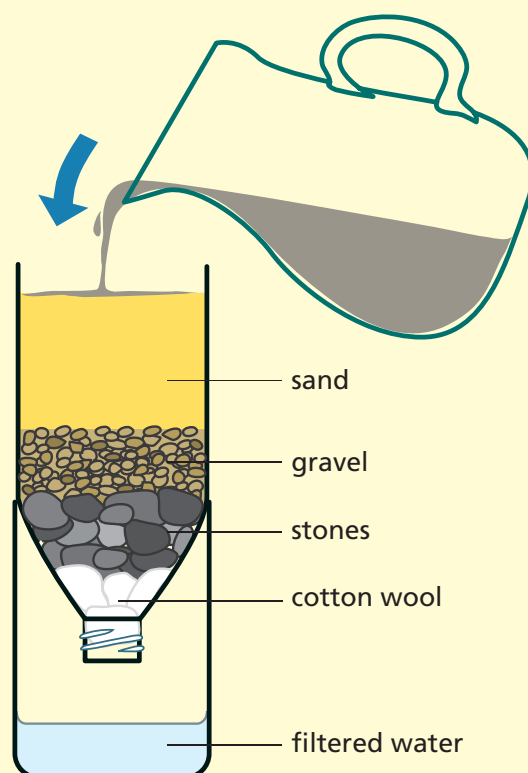
- 1 Cut the bottom off the plastic bottle.
- 2 Push cotton wool into the neck of the bottle. Make sure it is in tightly.
- 3 Rinse the stones and gravel that you will be using until they are clean.
- 4 Add stones so that they fill a quarter of the bottle.
- 5 Add gravel so that the bottle is half full.
- 6 Add sand almost to the top.
- 7 Rest the bottle on the clear container.
- 8 Mix some soil with some clean water in a jug to make dirty water and carefully pour it into the bottle.

Learning objective:

To find out how to separate solutions using **filtration**.

You will need:

- Soil/water mixture
- Cotton wool
- A jug
- Sand
- Beakers
- Gravel
- A large clear plastic bottle
- Scissors
- Stones
- Filter paper (optional)





Observations

- 1 Write down what you can see happening to the dirty water as it passes through the filter.

- 2 What can you see happening inside the bottle?

- 3 How clean is the water in the bottle base?



Investigating further

Here are some questions you could find the answers to:

- 1 What happens if you pour the water collected in the clear container through the filter again?

- 2 What happens if you add filter paper?

- 3 Which material do you think is the best at filtering the dirty water and why?

- 4 Investigate other materials to design your own water filter.
