

Lesson 7 - Cleaning used water



Before you start this session, please:

- Print Session Information sheet
- Print Activity sheets 7:1 and 7:2
- Print Supporting Information sheets 7:1 and 7:2
- Make sure you have access to the internet so that you can watch video clips on YouTube.
- Collect a pencil or pen to complete the activities in this lesson.

Cleaning used water

Let's get started

In earlier lessons you found out how water from the environment is cleaned and gets to your home so that you can have fresh, safe drinking water, so let's look at what happens to the water we have used.

Think of the ways that you use water (you did this in Lesson 3). What is the water we have used called? What happens when you pull the plug out of the sink? Where does the shower water and the water used to flush the toilet go?

Watch the video clip [Down the Drain](#) in the Education Playlist to see how the used water gets from your home to an Anglian Water recycling centre.

What can you remember?

What is the name of the pipes that take the used water from your home to the Water Recycling Centre? What makes the water move along? What does Anglian Water have to use if the land is very flat to keep the sewage moving?

What happens at the Water Recycling Centre?

Watch the video clip [Water Recycling](#) in the Education Playlist to see how Anglian Water cleans the water you have used.

Don't worry if you can't see the video, take a look at Supporting Information sheet 7:1.

Using the information from the video and/or from Supporting Information sheet 7:1, label the parts of the water recycling process on Activity sheet 7:1.

Investigating microscopic helpers:

Watch the video [Micro-organisms](#) on the Education Playlist to learn about the microscopic creatures (friendly bacteria) that help Anglian Water to clean the sewage.

If you cannot access the video, use Supporting Information sheet 7:2 and name the micro-organisms on Activity sheet 7:2.

Challenges:
Now have a
go at some
of these:

Make your own micro-organism out of things you have at home, recycling, modelling clay, Lego, etc. Make sure your micro-organism is detailed and can be recognised.

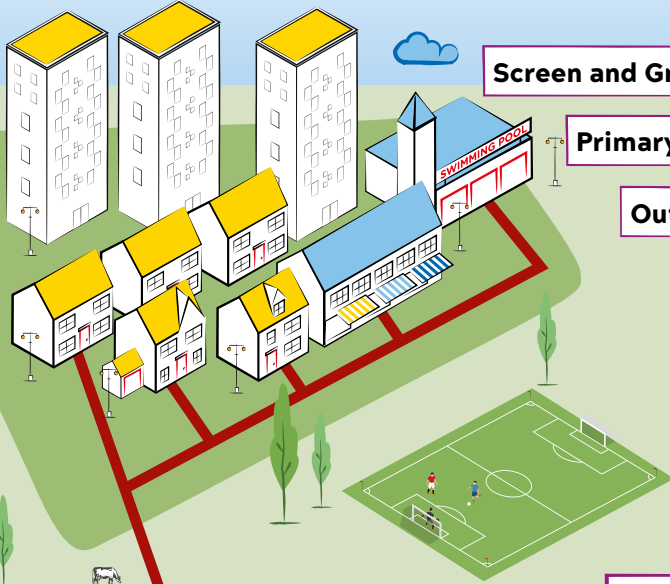
Tardigrades - can you find out what makes these tiny creatures the toughest on the planet?

Get your grownup to share your micro-organisms with us at Education@anglianwater.co.uk

Cleaning used water

Water cycling treatment process

To clean used water we use a natural process. From the names below can you match them with the part of the treatment works?



Screen and Grit removal

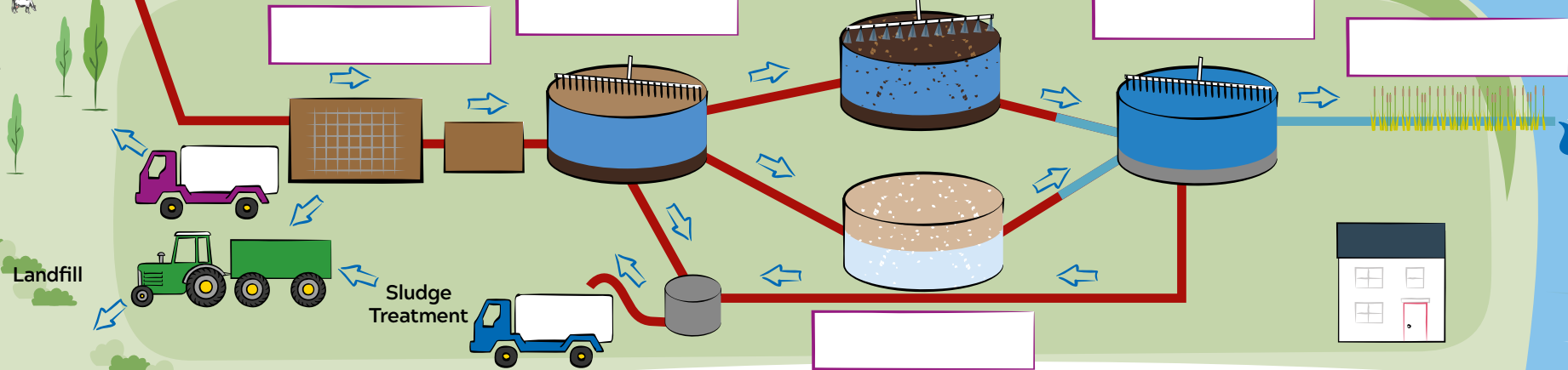
Biological filtration

Primary settlement tank

Aeration tank

Outfall

Final settlement tank



When the grit and gravel are removed from the sewage there is also lots of sweet corn and tomato seeds mixed in because our bodies can't break them down!

The energy used by Anglian Water to treat sewage is the same amount used to power 86,000 households.

We recycle the poo into fertilisers called biosolids, which is then sold to farmers. Each person produces about 55g of fertiliser a day.

Anglian Water has over 1,128 Water Recycling Centres which use a lot of energy to make used water clean.

Cleaning used water

Micro-organisms

Micro-organisms are very small creatures. There are lots of micro-organisms in the world around us doing very important jobs.

Anglian Water use micro-organisms to clean sewage.

Identify the micro-organisms:

Rotifer

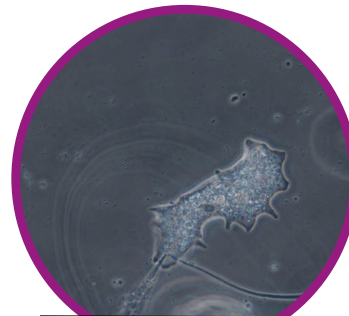
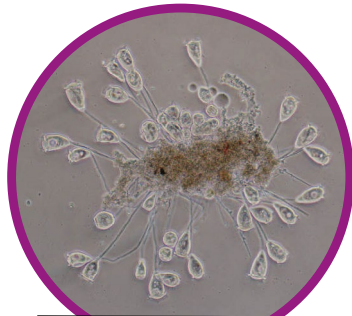
Sessile Ciliate

Amoeba

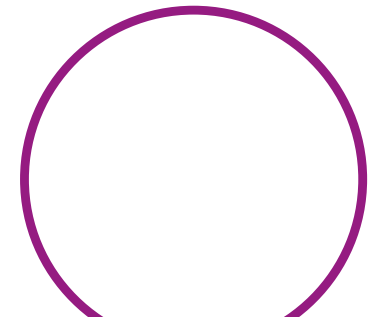
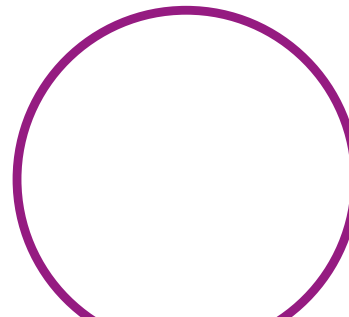
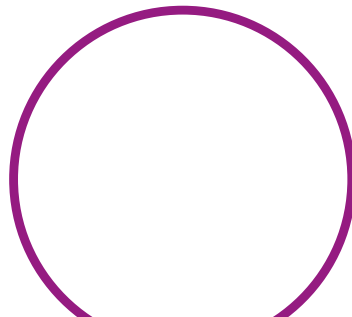
Vorticella

Ciliate

Tardigrade



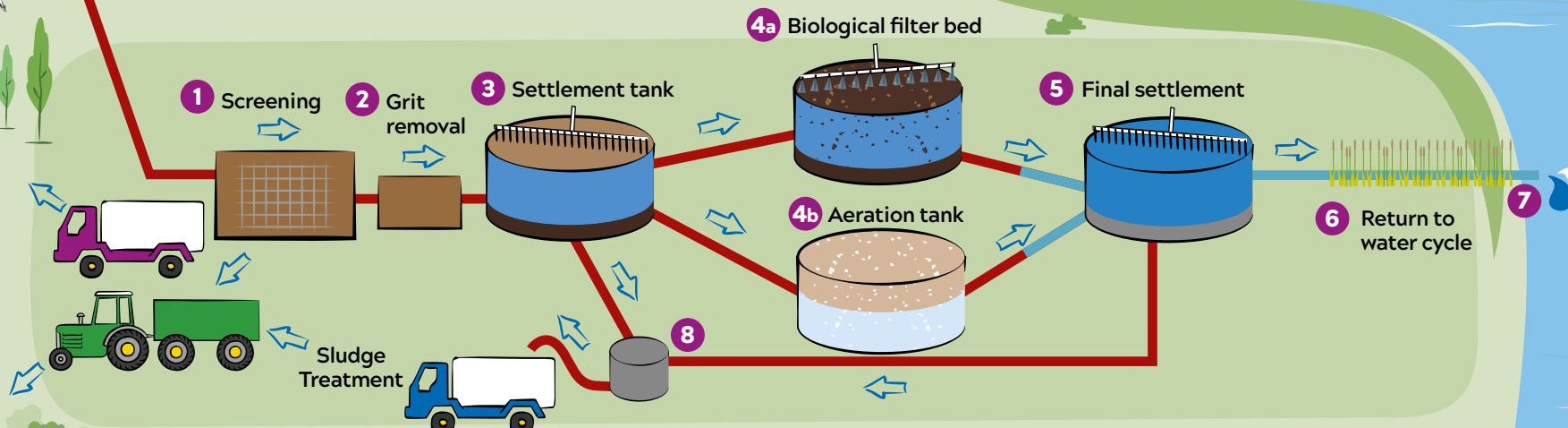
Draw some micro-organisms of your own in the empty circles and name them.



Cleaning used water

How we clean your sewage

- 1 Preliminary treatment**
Screening removes wood, paper, rags and plastic for disposal at landfill sites.
- 2 Grit removal**
Gravity causes the grit and sand to fall to the bottom. This then goes to landfill.
- 3 Primary treatment**
Settlement tank
Most of the solids sink to the bottom of the tank as sludge (poo and other solids). This is treated separately.
- 4a Secondary treatment**
Biological filter
The sewage is trickled onto beds of stone, where micro-organisms feed on the bacteria.
- 4b 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 the dirt sink to the bottom. Clean water flows off the top.
- 6 Tertiary treatment**
The liquid may be filtered again using reed beds, or sand filters.
- 7 The Outfall**
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.



Cleaning used water

The micro-organisms that help us clean the sewage

Use this sheet to complete Activity sheet 7:2 and to help you create your model micro-organism.

Look carefully and make sure your model is detailed.



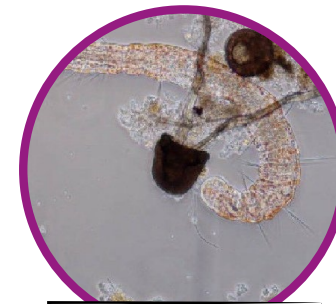
Ciliate



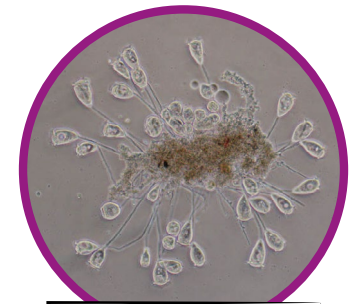
Cyclopoida



Rotifer



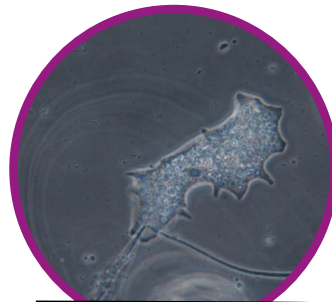
Nais worm



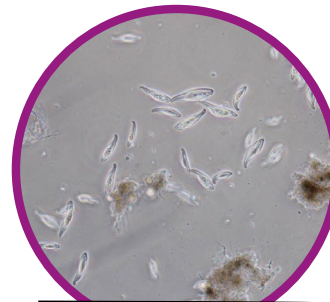
Sessile ciliate



Vorticella



Amoeba



Lionotus



Tardigrade