

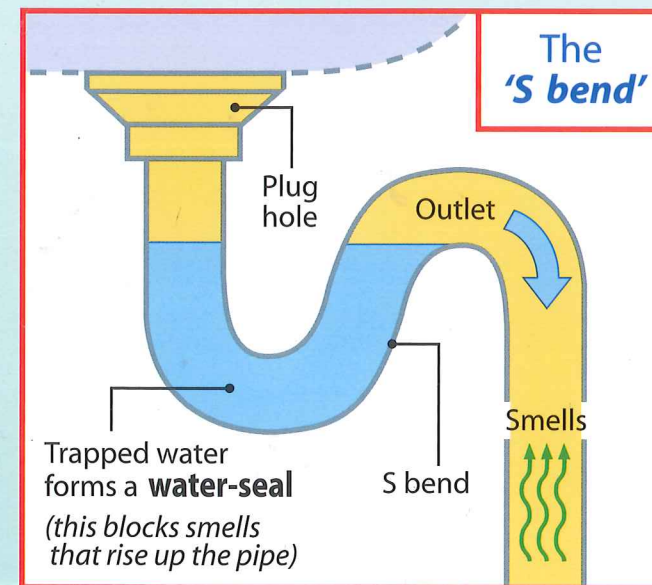
# How SEWERAGE Works

1 Have you ever wondered what happens to the sewage that is discharged from your bathtub or toilet? Many years ago there were no sewerage systems, so waste was simply thrown into an open sewer in the street and washed down the middle of the road. In fact, in some poorer countries this is still the case. Nowadays, houses in rural areas are likely to

be connected to a *septic sewerage system*, which stores all the sewage in a tank near the house. When the tank is full, the sewage needs to be collected and moved by a truck. In most city areas however, houses

are connected to a *reticulated sewerage system*. This means that the sewage from each house is sent to a central treatment plant.

- 2 A reticulated sewerage system is made up of many components and has to be installed in homes by a plumber. Its purpose is to carry all the liquid waste away from the house. This liquid waste, or sewage, is anything discharged by sinks, toilets, washing machines and baths. Only qualified plumbers are allowed to work on sewerage systems, as there is a risk of pollution or a disease outbreak if the sewerage system is not installed correctly.
- 3 When you take the plug out of a bath full of water, the water flushes down the drain into a water seal, which is sometimes referred to as an S bend. This water seal is usually located as close to the drain hole as possible. The bend is in the shape of a U and it is designed to hold some water in



it at all times. This water acts like a plug for sewage smells. Without the water in the S bend, the sewage smells would drift into the house. Toilets have an inbuilt S bend, which is why there is always some water held in them.

- 4 After it leaves the S bend, the sewage flows through a series of pipes to join into a larger pipe. This will take the sewage from the house to the street. This larger pipe is usually about 100mm in diameter and is often made of PVC (plastic). The advantage of plastic is that it is light and easy to use. It is also difficult for objects, such as tree roots, to penetrate plastic pipes.
  - 5 The large house pipe only goes as far as either your street or your backyard, where it meets an even larger pipe. This main sewer pipe carries the sewage of the entire street, joining up with other main sewer pipes on its journey.
  - 6 Since home sewerage relies on gravity to make the sewage flow, all pipes so far have had to run downhill. The street main lines, however, will join and run into pumping stations. These will pump the sewage to a treatment plant that is usually some distance away. If it is downhill to the treatment plant, then the sewage will not need to be pumped.
- At the treatment plant the sewage is filtered through a screen. This removes any solid matter such as paper or plastics.
- 7 It then flows into activated sludge aeration tanks where large air blowers force bubbles through the sludge.

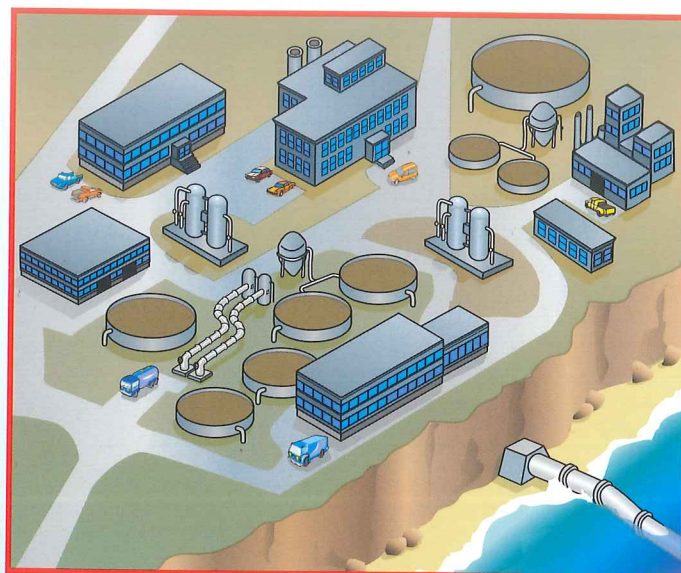
In the tanks, chemicals and bacteria are added in the outer ring of the tank. The sewage stays in the outer ring for a day where most of the waste is broken down. At this stage all of the pollutants are removed from the sewage.

- 8 The sewage then moves to the settling tanks where the bacteria that was added settles to the bottom to be reused again.

From here the water passes through pebble beds for a final filter, before being disinfected in an ultraviolet treatment plant.

- 9 The last step is to pump what remains into oceans or rivers, which is often an unpopular thing to do. However, many countries recycle their waste to be used as water for gardens or crops. You may find it hard to believe, but

it's also possible to purify sewage enough for people to drink it!



## Questions

- 1 City homes are usually connected to
  - a a reticulated sewerage system.
  - b a septic system.
  - c a rural treatment centre.
- 2 Which is not true about septic sewerage systems?
  - a Sewage is stored in tanks.
  - b Sewage is collected by trucks.
  - c Sewage is pumped to a central treatment plant.
- 3 The S bend, below the drain hole
  - a should smell.
  - b should have water in it.
  - c should have chemicals added to it.
- 4 Most sewerage pipes connected to the home rely on
  - a filters to remove any solid matter.
  - b gravity to carry the sewage down to the main pipes.
  - c pumps to pump the sewage down to the main pipes.
- 5 Which is not true about sewage treatment plants?
  - a They remove pollutants from the sewage.
  - b They pump infected waste into the oceans.
  - c They use ultraviolet light to disinfect the sewage.
- 6 Treated sewage may be suitable
  - a to water gardens and crops.
  - b to drink.
  - c to water gardens as well as to drink.

## Vocabulary

Find words in the text that match the meanings below. The word is in the section shown in brackets.

- 7 Waste matter that is carried away (1)
- 8 Capable and competent to do a task (2)
- 9 A trip (5)
- 10 Started or triggered something (7)
- 11 A group of microorganisms that may cause disease (8)

## Grammar

A **preposition** is a word situated before a noun to show when or where something happened.

E.g. **on** the mat, **in** the bin, **over** the fence, **before** the party, **under** the tree.

Find a **preposition** in the sentences below from the text.

- 12 An open sewer in the street.
- 13 Sewage is filtered through a screen.
- 14 The pipe is near the house.
- 15 Water flushes into a water seal.

## Back To The Text...

- 16 What would be a good sub-heading for section 4?
  - a Out to the Street
  - b The Pumping Station
- 17 The illustration on the front of the card shows the property's pipes
  - a in red.
  - b in orange.
- 18 The purpose of this text is
  - a to persuade.
  - b to explain.

## Think About This

- 19 The diagram on page 2 shows
  - a water travelling up the pipe.
  - b smells travelling up the pipe.
  - c rats travelling up the pipe.
- 20 The illustrations that form part of the title are usually found
  - a in the laundry.
  - b in the kitchen.
  - c in the bathroom.
- 21 On which page does the the illustration suggest that sewage is "treated"?
  - a page one
  - b page two
  - c page three
- 22 The word *penetrate* in section 4 is best replaced with
  - a crush.
  - b infiltrate.
  - c clean.
  - d close.
- 23 Why do you think it takes many days before the treated sewage is released into the sea?
  - a Treatment plants are built in remote areas away from homes.
  - b The treatment process requires many steps.
  - c It is a very unpopular process.

## Challenge Option

Vocabulary: How many words can you make from the word SEWERAGE?

