Name: Group:

9 Water Pollution

THE EARTH AND US

Overview of Water Treatment

Humans and other organisms depend on clean water for nutrients. Unfortunately, human activities cause worldwide **water pollution**. To protect ourselves, we must also protect our water supply.

Pollutants come from many different sources. **Point sources**, like factories and sewage plants, are easy to identify and regulate. Waste can be treated before release. Then it can be released under controlled conditions into flowing water. There, natural processes will **cleanse** the water and filter out **degradable waste**.

Nonpoint sources are more challenging to manage. These sources often leak pollutants into inaccessible **groundwater**. Since the water moves slowly, it does not **dilute** waste very quickly. Excessive nutrients leak into lakes and streams, causing **cultural eutrophication**. While some **eutrophication** is okay, too much algae impairs other life.

To address these problems, we must treat wastewater. Before water can be reused, it must undergo **disinfection**. This can be done chemically by **chlorination**, or with **UV light**. For urban sewage, **primary sewage treatment** is a method that removes solids from waste. This can be combined with the biological purification of **secondary sewage treatment**. Together, they remove up to 97% of organic waste from water. **Septic tanks** are a good way to perform treatment for individual homes.

Get ready!

1 Before you read the passage, talk about these questions.

1 How do most rural homes treat waste?

2 What can happen if waste gets into streams and ponds?

Reading

2 Read the pamphlet. Then, mark the following statements as true (T) or false (F).

1 __ Point sources are easier to control than nonpoint sources.

2 __ The pamphlet recommends promoting cultural eutrophication.

3 __ Multiple methods of disinfection are available.



Vocabulary

3 Match the words (1-8) with the definitions (A-H).

1 __ dilute
2 __ cleanse
3 __ UV light
4 __ groundwater
5 __ chlorination
6 __ eutrophication
7 __ water pollution
8 __ primary sewage treatment

A a process in which extra nutrients leak into a body of water

B the presence of harmful materials in water

C to remove impurities from something

D a type of disinfection that involves adding a chemical

E to make something weaker or less concentrated

F a type of energy that is used for disinfection

G a process in which solids are separated from water

H water that is present underneath the soil

4 Fill in the blanks with the correct words and phrases from the word bank.

WORD BANK

point source | degradable waste | disinfection | nonpoint source | cultural eutrophication | secondary sewage treatment | septic tank

1 After filtration, the water undergoes _____ to remove any harmful bacteria.

2 Water from a _____ comes from one particular place.

3 Flowing water naturally breaks down _____.

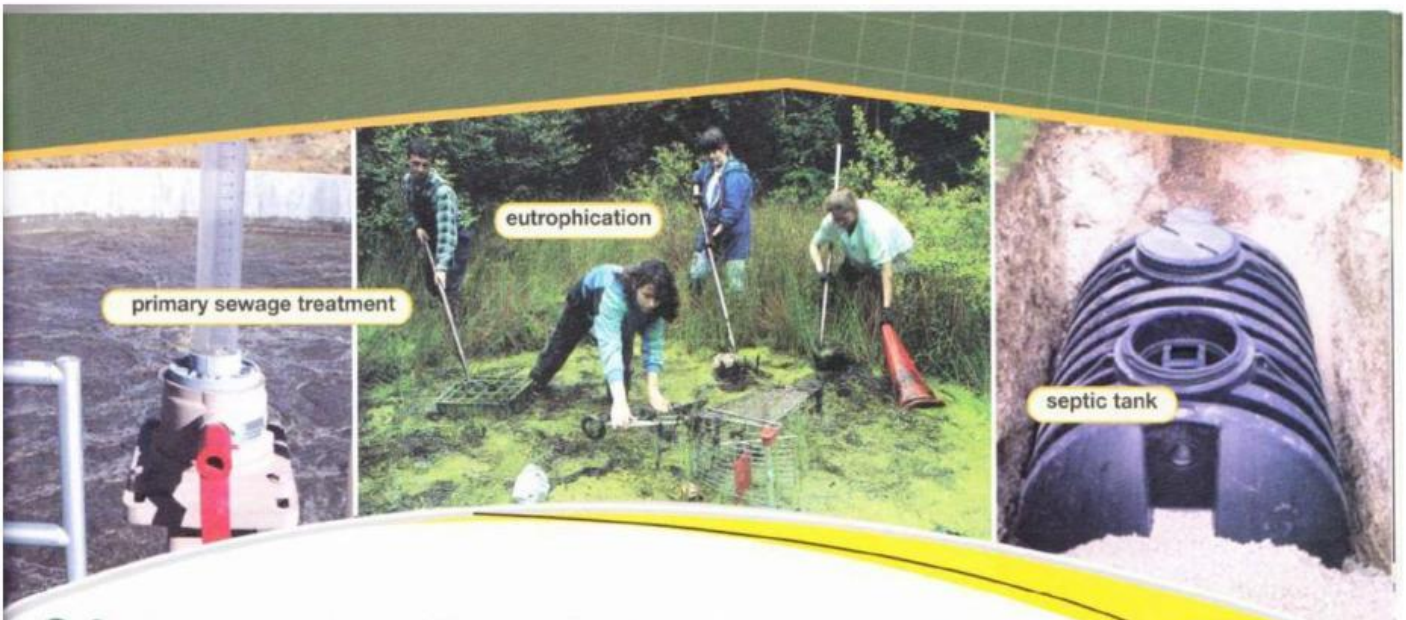
4 During _____, bacteria process organic waste from the water.

5 A rural home often has a _____ to process its waste.

6 Water from a _____ often leaks over a large area.

7 _____ occurs when excessive nutrients get into a body of water.

LIVEWORKSHEETS



5 🎧 **Listen and read the pamphlet again. What type of waste breaks up in fast flowing water?**

Listening

6 🎧 **Listen to a conversation between two scientists. Choose the correct answers.**

1 What is the main idea of the conversation?

- **A** why a particular area has excessive water pollution
- **B** which systems are most appropriate for a new treatment plant
- **C** where to release a point source of wastewater
- **D** how to improve the city's septic systems

2 What is the current treatment method for the area's wastewater?

- **A** septic systems
- **B** primary sewage treatment plant
- **C** secondary sewage treatment plant
- **D** chlorination

7 🎧 **Listen again and complete the conversation.**

Scientist 2: Well, the two-part system is pretty effective. I definitely think they should use **1** _____ _____ _____ sewage treatment.

Scientist 1: That will remove most of the waste from the water. But they'll need **2** _____ _____ _____ too.

Scientist 2: Oh, that's true. What about **3** _____?

Scientist 1: I don't know. That can produce harmful chemical reactions. Maybe UV light **4** _____ _____ _____.

Scientist 2: But that's **5** _____ _____ _____. The results don't last as long.

Scientist 1: I guess you're right. Let's give both options to the council and see what they **6** _____ _____ _____.

Scientist 2: Good idea.

Speaking

8 **With a partner, act out the roles below based on Task 7. Then, switch roles.**

USE LANGUAGE SUCH AS:

We're supposed to ...
They need something for ...
What kind of ...?

Student A: You are a scientist. Talk to Student B about:

- treating polluted water
- which methods are more effective

Student B: You are a scientist. Talk to Student A about treating polluted water.

Writing

9 **Use the pamphlet and the conversation from Task 8 to write a water treatment recommendation for the city council. Include: how the water is currently treated and recommendations for new treatment methods.**

LIVEWORKSHEETS