

# Water Recycles poster

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The "Water ReCycles" poster is designed for students of all ages. It shows the natural water cycle and humans' influence on water resources.

## ***Raincloud illustration***

The raincloud in the upper right corner of the illustration shows precipitation. Rain precipitation occurs when there is so much water in the air that the air cannot hold it anymore. Precipitation fills up our lakes, streams, and oceans on the surface of the earth. The illustration shows that from that lake, water enters a drinking-water treatment plant. After treatment, this water is transported through underground pipes to homes and industries.

## ***Water storage illustration***

The earth also soaks up some of the water, storing it in the ground until it is needed. This natural storage area is called an aquifer. Many people pump water directly from an underground aquifer and use it for their drinking water. This is shown on the bottom right corner of the illustration.

## ***Wastewater illustration***

Biosolids are a solid part of wastewater, and separating the solids from the liquid is one of the main goals of wastewater treatment. The reuse of wastewater is shown on this illustration in farmland and golf courses. This is seen on the bottom left side of the illustration.

## ***Hydroelectric illustration***

Hydropower is an important and widely used source of energy. Water is used to produce electricity. Although most energy is produced by fossil-fuel and nuclear plants, hydroelectricity is still important. Most hydroelectric power plants have a dam and a reservoir that can also obstruct fish migration and affect their populations. This can be seen on the left side of the illustration.

## ***Vapor illustration***

When the sun heats the water, liquid turns into vapor or steam. Plants, trees, and the land add vapor because they lose water too. This is called transpiration. When vapor in the air gets cold, it changes back into liquid to form clouds. This is called condensation. This is seen in the top left corner of the illustration. These clouds get heavy and we start water recycle all over again.

# Water Recycles: The Complete Story

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## *Water*

Water (which has a chemical formula of Dihydrogen Monoxide or H<sub>2</sub>O) covers 71 percent of Earth's surface. Almost all of that is saltwater in our oceans. Freshwater accounts for only 3 percent of total water and more than two-thirds of it is frozen in glaciers. Liquid freshwater (groundwater, lakes, streams, rivers), which is what people use to drink, farm, clean, and use for most tasks, makes up less than 1 percent of all the water on Earth! Most of the water we need to live is groundwater (about 99 percent) so understanding the water cycle and learning that water is a limited resource is important for teachers, students, and all Texans.

## *ReCycle*

The word "recycle" calls to mind images of paper grocery bags filled with newspapers or a collection of crushed aluminum cans, plastic containers, and glass bottles. Most of us do not connect water with recycling. Yet, the water (or hydrologic) cycle is a good example of recycling. Water recycling means reusing treated wastewater for helpful purposes such as lawn and crop watering, industrial processes, toilet flushing, and replenishing a ground water basin (referred to as ground water recharge).

## *The Water Cycle*

In its basic form, the cycle is simple. The sun's energy converts liquid to vapor (**evaporation**). The water vapor, being lighter than air, rises in the atmosphere until the cooler temperatures turn it into tiny droplets of water (**condensation**). These droplets come together to form clouds. In the clouds, the droplets combine to form larger drops. When these drops reach a larger size, gravity pulls them back to Earth's surface (**precipitation**). Though the water cycle can be much more complex, knowing the basics will help you understand where water comes from and where it goes.

## *Humans and The Water Cycle*

This poster, Water ReCycles, is for "learners" of all ages, both in and out of a formal classroom. Most of us learn about water and the water cycle in grade school. However,

even as adults, we often have trouble recognizing and understanding the ways humans affect the natural water cycle. By including the pumps, pipes, and treatment plants (infrastructure) in this poster, you can see these “two water cycles”—natural and human-affected—and how they relate to one another. Look at the poster for examples of water recycling that Texans can do at home, such as using a rain barrel to harvest rainwater.

The poster also includes elements that show some of the complex water-related issues we face today, such as stormwater pollution and hydroelectric power generation, among others. We hope this poster encourages you to study and discuss these issues.

For more information and resources, visit [TakeCareOfTexas.org](https://www.TakeCareOfTexas.org).

# “Water Recycles” Word Map

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4. The illustration of a rain cloud shows precipitation of rain falling towards the ground into the river.
8. This shows the surface water that leads to the drinking water plant.
11. The pumps, pipes, and treatment plants in the poster are used to clean water.
6. Water is entering the soil to become groundwater stored in an aquifer.
3. The illustration shows the rate at which soil is able to absorb rainfall or irrigation.
1. Harvesting rain is illustrated with a rain barrel.
2. This illustration is an industrial semi-solid wastewater treatment plant.
9. Underground pipe used as part of the sewage treatment process.
7. Recycled wastewater is used to irrigate farmland and golf courses.
5. Power plant that produces energy is illustrated.
12. An illustration of evaporation: when vapor in the air gets cold, it changes back into liquid to form clouds. This is called condensation.
10. This illustrates condensation forming heavy clouds of precipitation.

# How and Why Do We Recycle Water?

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Unscramble the words to identify words related to water use and the environment.

n i r a  
(Rain)

w s o n  
(Snow)

i l a h  
(Hail)

e c n a o  
(Ocean)

a e l k  
(Lake)

v r e i r  
(River)

a v s i h r e t n g  
(Harvesting)

f q r u i e a  
(Aquifer)

e i r o r v e s r  
(Reservoir)

o g f  
(Fog)

e r a r b l  
(Barrel)

i s o l  
(Soil)

s a l p t n  
(Plants)

s i l o s i o b d  
(Biosolids)

ropwe nlatp  
(Power plant)

etneamh  
(Methane)

# Water, Land Use, and Wastewater Treatment Crossword

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## Questions:

### ***DOWN***

- 1 A mixing of fresh and salt water
- 2 Used in disinfection of water
- 3 Aids coagulation
- 5 Lawn fertilizer, oil drained from cars, septic tank overflows
- 7 What a rain barrel is used for
- 8 Erosion from logging, road construction
- 11 Fertilizers or manure draining into a stream
- 12 Numerous types of chemicals and products
- 13 Widely used disinfectant
- 14 Landscape irrigation with effluent
- 15 A lake containing a high concentration of dissolved nutrients
- 18 Water that is safe to drink

### ***ACROSS***

- 4 Water that remains below the land surface
- 6 Treated wastewater
- 9 Muddy water
- 10 Straightening and deepening of stream or river channels
- 16 Any natural or artificial holding area
- 17 Stratum of the earth composed of water layered between rock
- 19 The mixing or agitation of wastewater
- 20 Nutrient-rich, stabilized by-product used as fertilizer
- 21 An area that is regularly saturated by surface water

# Answers:

## *Down*

1. Estuary
2. Ozone
3. Polymer
5. Residential
7. Harvesting
8. Silviculture
11. Agricultural
12. Industry
13. Chlorine
14. Reuse
15. Eutrophic
18. Potable

## *Across*

4. Groundwater
6. Effluent
9. Turbid
10. Channelization
16. Reservoir
17. Aquifer
19. Aeration
20. Biosolids
21. Wetland