

Student Handouts



WATER RECYCLES

-The Complete Story-

Handout 1— The Water Cycle



Source: Water
Environment Association
of Texas and EPA Region 6
Water Quality Protection Division

Copyright 2013 © Water Environment Association of Texas

Water^{Re}Cycle^s: The Complete Story

Water

Water (which has a chemical formula of Dihydrogen Monoxide or H₂O) 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

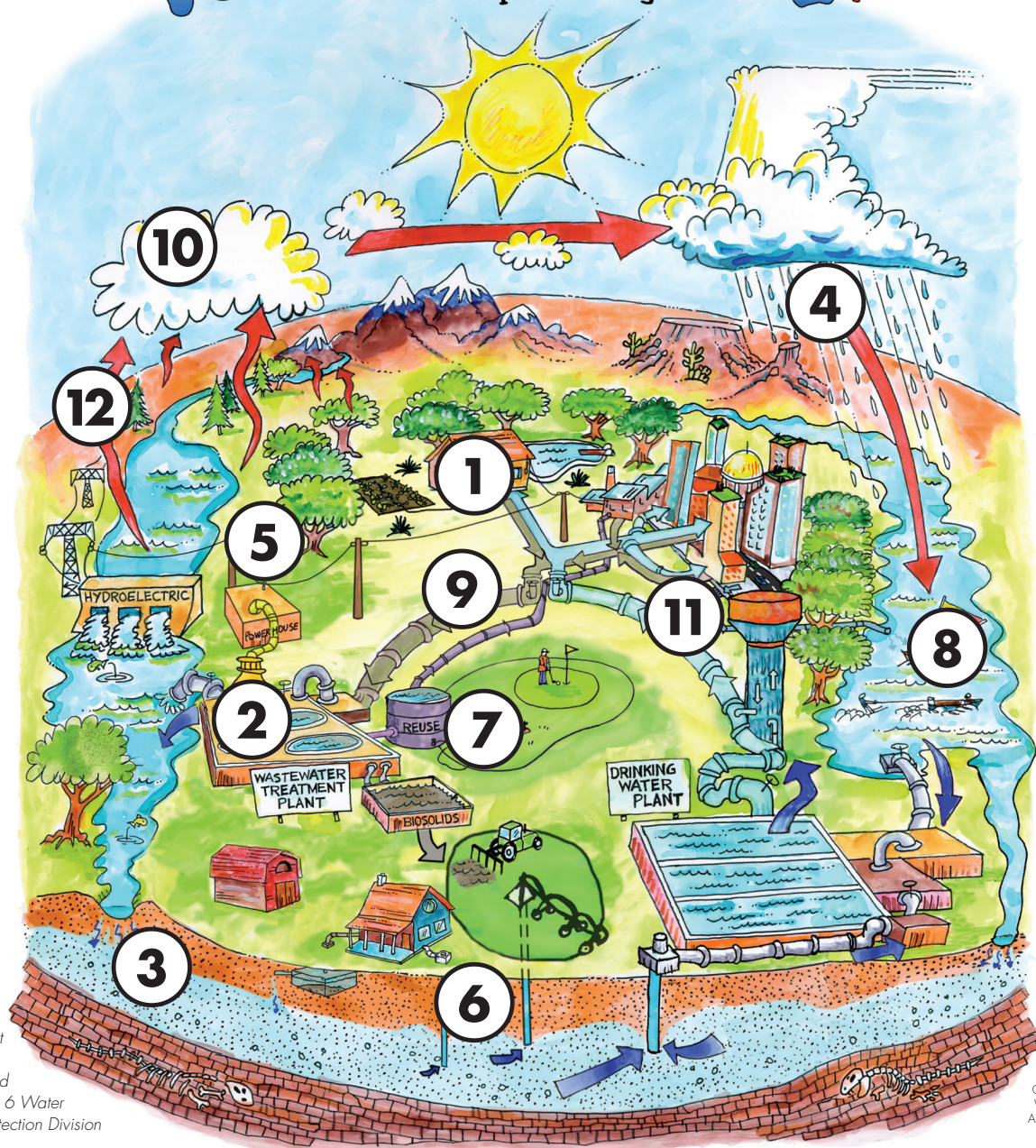
This poster, Water ReCycles, is for "learners" of all ages, both in and out of a formal classroom. Most of us learn about water and the water cycle in grade school. However, even as adults, we often have trouble recognizing and understanding the ways humans affect the natural water cycle. By including 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 on the previous page 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.

WATER RECYCLES

-The Complete Story-

Find the answers for this activity at
<TakeCareOfTexas.org/kids/
water-cycle-poster>.



Source:
Water
Environment
Association
of Texas and
EPA Region 6 Water
Quality Protection Division

Copyright 2013 ©
Water Environment
Association of Texas

Fill in the blanks from these words:

sludge precipitation power plant ground water reuse surface water sewage
rain barrel condensation drinking water evaporation infiltration

- | | | | | | | | |
|---|-------|---|-------|---|-------|----|-------|
| 1 | _____ | 4 | _____ | 7 | _____ | 10 | _____ |
| 2 | _____ | 5 | _____ | 8 | _____ | 11 | _____ |
| 3 | _____ | 6 | _____ | 9 | _____ | 12 | _____ |

Bonus: What do the dinosaur bones represent?

How and Why Do We Recycle Water?

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

Find the answers for this activity at <TakeCareOfTexas.org/kids/water-cycle-poster>.

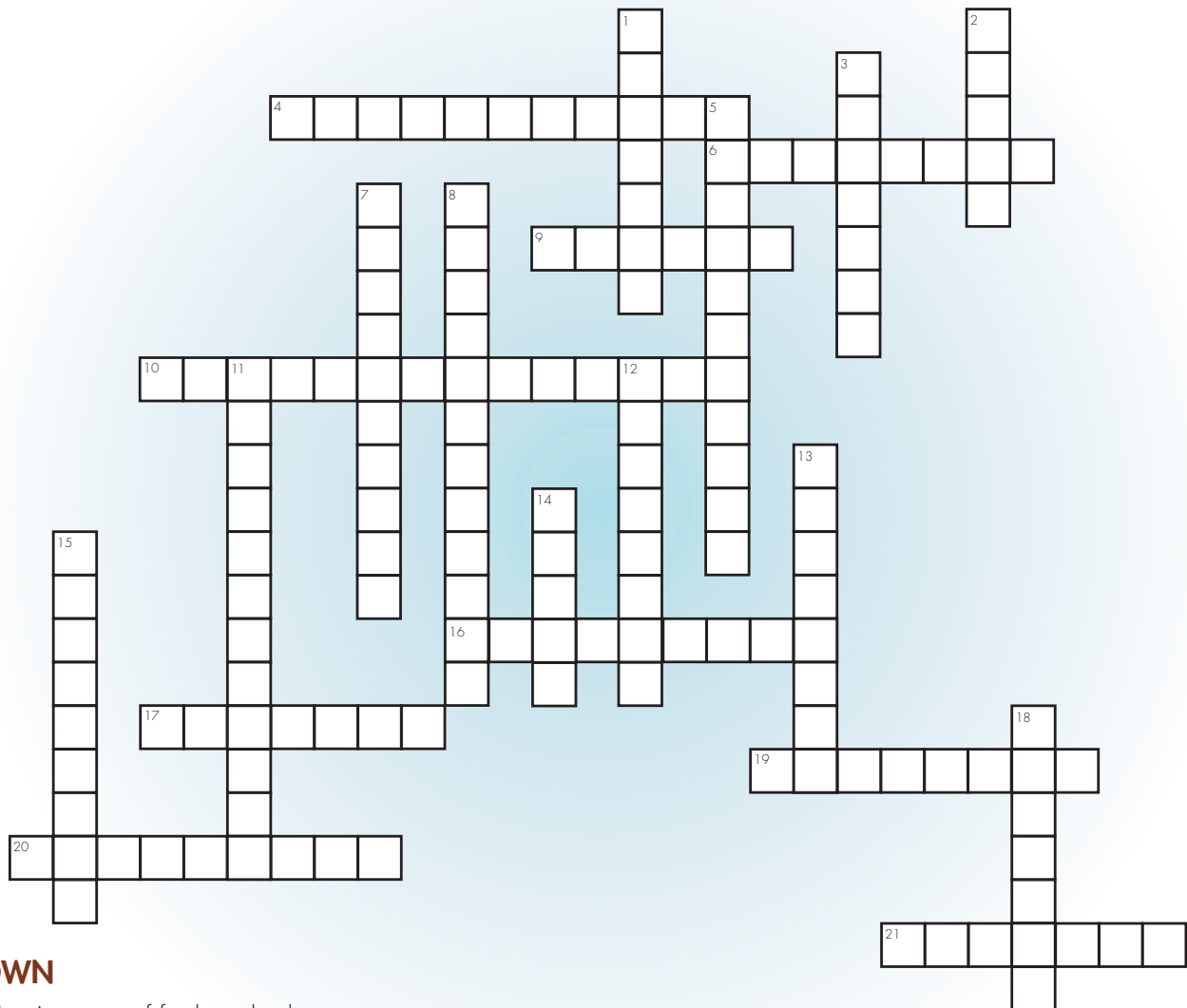
nira	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	2	
wson	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	9	
ilah	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	6	
ecnao	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	5	
aelk	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	3	
vreir	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	4	
avsihretng	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	1	
fgruiea	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	8	
eirorvesr	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	15	
ogf	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	10	
erarbl	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	14	
isol	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>		
salptn	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	11	
silosiobd	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>		
ropwe nlatp	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	7
etneamh	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	12	

Use the numbered letters from above to find the answer!
What letter is missing?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Water, Land Use, and Wastewater Treatment

Find the answers for this activity at <TakeCareOfTexas.org/kids/water-cycle-poster>.



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