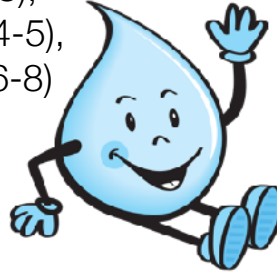


# TEACHER BACKGROUND INFORMATION



for *Water Smart Kids* (grades 1-3),  
*Our Water, Our Future* (grades 4-5),  
& *Watching Our Water* (grades 6-8)

Developed by:  
*Environmental Education Exchange*  
[www.eeexchange.org](http://www.eeexchange.org)  
Updated 2019



Tucson's inhabitants live in a delicate balance with water. Here in the Sonoran Desert, we receive only 10-12 inches (25.4-30.5 cm) of rain each year and have no perennial (continuously flowing) rivers nearby. Our population has grown from 7,500 in 1900 to almost 1,000,000 in 2019 (for the greater metropolitan area). In addition to our extraordinary population growth, lifestyle amenities such as swimming pools, outdoor landscaping, and daily showers have resulted in a rapid depletion of our **groundwater**. In 1875, residents could dig just 25 feet (7.5 m) underground to access water, and the local Santa Cruz River flowed perennially. Today the river is dry and we must drill down about 225 feet (69 m) in order to reach the aquifer.



In 2001, Tucson Water began blending its groundwater with **Colorado River water** that is pumped 336 miles (541 km) from Lake Havasu via the Central Arizona Project (CAP). There are fourteen pumping stations along the CAP to help move the water from lower to higher elevations, with a gain of nearly 3,000 feet (914 m). The CAP is the largest single user of electricity in Arizona.

After the Colorado River water travels through the CAP, it is recharged into large basins west of the Tucson Mountains, where it percolates down to the water table before it is pumped up and into Tucson. Currently, Tucson's water supply is a blend of approximately 10 percent groundwater and 90 percent Colorado River water.







In addition to groundwater and Colorado River water, reclaimed or **recycled water** is also used in Tucson. After our water is used, it travels in pipes to the Agua Nueva Water Reclamation Facility where the wastewater, or effluent, goes through a process that mechanically and chemically cleans it. Millions of gallons of recycled water are distributed through a system of 200 miles (322 km) of purple pipes to landscaping at parks, schoolyards, and golf courses. Some places are already recycling their water for drinking (for example: Orange County Water District in California - which includes Disneyland - and the International Space Station).



In 2019, Tucson Water initiated the Santa Cruz River Heritage Project, which adds recycled water to the Santa Cruz River near A Mountain. This recycled water supports the growth of native vegetation and the return of endangered wildlife in and along the Santa Cruz River, and provides recreational and economic opportunities. In addition, some of the recycled water percolates underground to help recharge our aquifer.

Tucsonans can also use **rainwater** as an important source of water. Rainwater harvesting is the capture, diversion, and storage of rainwater for landscape irrigation and other uses, using cisterns, basins, and curb cuts. By using collected rainwater to water native and desert-adapted plants, we are reducing the use of drinking water for landscape irrigation.



All of Earth's water moves through a cycle of use and reuse - the water cycle. Wherever water is located in this cycle, it's valuable and sustains life. So, although we have four sources of water in Tucson - groundwater, Colorado River water, recycled water, and rainwater - we really shouldn't think of them as four separate water sources, but as **One Water**, which we need to value and manage in a sustainable way so that we have water now and for our future.





Tucson has been affected by drought and higher temperatures resulting from global climate change, and the Colorado River is not a limitless supply of water. In addition, Tucson's population continues to grow. Thus, **water conservation** is as important as ever. Being Water Smart includes taking shorter showers; turning off the faucet when brushing teeth, washing hands, and washing dishes; installing low-flow showerheads, faucet aerators, and toilets; doing full loads of laundry; using drip irrigation and desert landscaping; and more!



Tucson Water's outreach education programs promote a water-conscious culture by fostering a deeper understanding of our relationship with water in the desert. Our programs seek to provide students with a fun learning experience that will increase their appreciation of water and generate enthusiasm for water-saving practices for years to come. Programs include *Water Smart Kids* (grades 1-3); *Our Water, Our Future* (grades 4-5); and *Watching Our Water* (grades 6-8). To schedule classroom presentations and learn more about related lessons, go to [www.eeexchange.org/teachers](http://www.eeexchange.org/teachers).



## Vocabulary

for *Water Smart Kids* (grades 1-3), *Our Water, Our Future* (grades 4-5), and *Watching Our Water* (grades 6-8)

(Note: Use this vocabulary list as appropriate for your grade level students.)

**aquifer** the underground layers of rock, sand, and gravel where water is stored over millions of years

**Central Arizona Project** the 336-mile (541 km) canal that transports Colorado River water to Phoenix and Tucson

**Colorado River** the largest river in the western United States (which flows through many states, including Arizona)

**condensation** occurs when water vapor cools and becomes liquid; clouds are formed through this process (could be considered the opposite of evaporation)

**desert** a dry region of the world that receives less than 12 inches (30.5 cm) of rainwater each year

**evaporation** occurs when liquid water changes into water vapor, a gas (could be considered the opposite of condensation)

**groundwater** water that exists beneath the Earth's surface in an aquifer

**natural resource** any resource that we use or take from the natural environment; can include both materials and energy (examples: water, trees, soil, natural gas, oil, or minerals)

**non-renewable resource** material considered finite in amount (examples: petroleum, coal, copper), or exhaustible because of scarcity, the great length of time required to form, or rapid depletion

**percolation** the downward movement of water through soil

**precipitation** water falling, in a liquid or solid state, from the atmosphere to the Earth (examples: rain, snow, hail, sleet)

**recharge** the addition of water, usually from rain and snowmelt, into the aquifer; may be artificially done by humans

**recycled water** (reclaimed water) wastewater cleaned to government standards to be reused for many purposes

**renewable resource** material that can be renewed, restored, or regenerated by natural ecological cycles or sound management practices (examples: plants, animals and sunlight; water is considered renewable through precipitation and recharge, but in the Tucson area, it is a limited renewable resource)

**resource** source, ability, or supply from which we draw in time of need

**runoff** water from rain or snowmelt flowing downhill into washes, streams, and rivers

**Santa Cruz River** the largest river in Tucson, which is now dry most of the year and only flows after significant rains

**transpiration** the evaporation of water from plants; occurs primarily through the leaves

**water table** the uppermost surface of groundwater in the aquifer

**well** a hole dug or drilled down into the aquifer to locate and obtain water (deep water is usually brought up to the surface with a pump)