

Pre-Visit Lesson: *Tucson's Water Story*



Lesson Overview

Conduct this pre-visit activity before the *Our Water, Our Future* classroom presentation to prepare students with the necessary vocabulary and content. First, students discuss vocabulary related to Tucson's water sources. Next, they watch a short video about how water has historically been used in the Tucson area to learn more about where our water comes from and how we use it. Last, students learn about nature's water cycle in the Tucson area.

Arizona Department of Education Academic Standards

Please refer to the Arizona Department of Education Academic Standards file for the ADE standards addressed by this lesson.

Lesson Overview

Students will be able to:

- ➔ define and describe the following vocabulary: surface water, groundwater, aquifer, precipitation, runoff, recharge, Central Arizona Project, recycled (reclaimed) water.
- ➔ describe how water has historically been used in the Tucson area.
- ➔ describe nature's water cycle using the following vocabulary: condensation, evaporation, percolation, precipitation, and transpiration.
- ➔ describe the distribution of water on Earth's surface.

Materials

- ➔ Part One (optional materials): Pictures of water in the environment as rain, snow, rivers, lakes, puddles, runoff, etc.
- ➔ Part Two: Smartboard or projector to show the short *Our Water, Our Future* Pre-Visit Video located at www.eeexchange.org/teacherowf
- ➔ Part Three:
 - *Water Cycle Wiggle Vocabulary Words*, one printed copy cut into strips
 - Display Sheet: *Nature's Water Cycle*
 - Answer Key: *Nature's Water Cycle*

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Procedure (estimated time one hour)

Part One: Tucson's Water Sources

1. Inform students that this lesson will prepare them for an upcoming presentation about water called *Our Water, Our Future*.

2. Use the following questions to guide a class discussion about water. Write words on the board as discussed. (Optional: Enhance the discussion using pictures of water in the environment where appropriate.)
 - a. *Where in our natural environment can we find water?*
 - In washes, streams, rivers, puddles, lakes, etc. - **surface water**
 - Underground between rocks, sand, and clay - **groundwater**
 - ▶ Layers of rock, sand, and clay that hold groundwater - **aquifer**
 - Falling from the sky as rain, snow, sleet, or hail - **precipitation**
 - Flowing down the street, in washes, etc., after it rains - **runoff**
 - In the atmosphere - **water vapor** (when liquid water evaporates to become a gas)

 - b. *Where Can water be added to the aquifer? How?*
 - **Recharge** - the addition of water, usually from rain and snowmelt, into the aquifer; may also be artificially done by humans (will learn more about this during the classroom presentation)

 - c. *We have two additional sources of water in Tucson. Do you know what they are?*
 - **Colorado River** - the largest river in the western United States (which flows through many states, including Arizona)
 - ▶ **Central Arizona Project** - the 336-mile (541 km) canal that transports Colorado River water to Phoenix and Tucson
 - **Recycled (reclaimed) water** - wastewater cleaned to government standards to be reused for many purposes

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d. *Let's learn more about water use and water sources throughout Tucson's history by watching a fun video!*

Part Two: *Our Water, Our Future* Pre-Visit Video

It is **critical** to show this short video before the classroom presentation to prepare students with the necessary vocabulary and content.

Part Three: Our Water Cycle

1. *Water Cycle Wiggle*. Students learn water cycle vocabulary (condensation, evaporation, percolation, precipitation, transpiration) through the following activity:

- a. Ask students: *What is the **water cycle**?* The water cycle includes all the places we find water and all the ways water moves around in the environment, as a solid, liquid, or gas.
- b. Divide the class into five teams.
- c. Distribute one vocabulary word with its definition to each team.
- d. Challenge the teams to prepare a short presentation (one minute or less) to explain their word to the class, using one or more presenters. They should include a sound and body movement to demonstrate their word.
- e. Class presentations. Have each group present their word with matching sound and body movements.
- f. When all the groups have presented, call the words out, one at a time, varying the order. Ask all students to stand up and act out the matching sound and body movements.

2. *Nature's Water Cycle*. Show the *Nature's Water Cycle* display sheet using a smartboard or projector (be sure to use the display sheet with blank spaces for the vocabulary words). *Nature's Water Cycle* illustrates the natural water cycle, using the

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Tucson region as an example.

a. Explain to the students that the water cycle also happens on a global level. What differs from region to region are the plants, animals, bodies of water, and land through which water moves.

b. Using the *Nature's Water Cycle* display sheet, point out places water can be and ways water can move. For example, water can be in the clouds. One way that water gets to the clouds is through evaporation. As you point out the places where water can be (clouds, plants, river, or soil), remember to discuss how it gets there, using the vocabulary from the *Water Cycle Wiggle*. Now, fill in the blanks with the appropriate words describing ways water can move. You may choose to call upon students to come up and fill in the blank or write the words in yourself. Next, ask students to name ways that water might move in our environment. Draw arrows to show a range of possibilities. Be sure to mention that the water cycle is not a single large cycle but a complex system within which water moves in many ways.

4. Discuss the distribution of water on Earth's surface. Over 97 percent is salt water, found in the oceans. Less than three percent is freshwater. But not all of the freshwater is available to us. Two percent of Earth's water is in the polar ice caps. All of the moisture in lakes, rivers and streams, the atmosphere, and underground adds up to less than one percent of Earth's water. Although our water supply is renewable to some extent, water is truly a precious and very limited resource! For example, if we use more water than is recharged, or if there is a drought so that there is less recharge, then our water isn't truly renewable.

Extension Ideas

- Have students write dialogues and create costumes to act out different roles in *Tucson's Water Story*. Give a presentation to younger grades and/or other classes not participating in this program.
- Have students draw their own water cycle pictures, using appropriate vocabulary and imagery depicting the Tucson area.

Water Cycle Wiggle Vocabulary Words

Teacher Instructions:

Photocopy this sheet. Cut out the words and their definitions into five strips.

Distribute one strip to each team.



Condensation: occurs when water vapor cools and becomes liquid

Examples of condensation: when the steam from a hot shower forms water droplets on the mirror; when clouds form.



Evaporation: occurs when liquid water heats up, changes into water vapor (a gas), and rises into the sky

Example of evaporation: when a wet towel dries, the water has evaporated into the air.



Percolation: the downward movement of water through soil

Example of percolation: when rainwater from a puddle sinks down into the ground.



Precipitation: water falling, in a liquid or solid state, from the atmosphere to Earth

Examples of precipitation: rain, snow, hail, sleet.

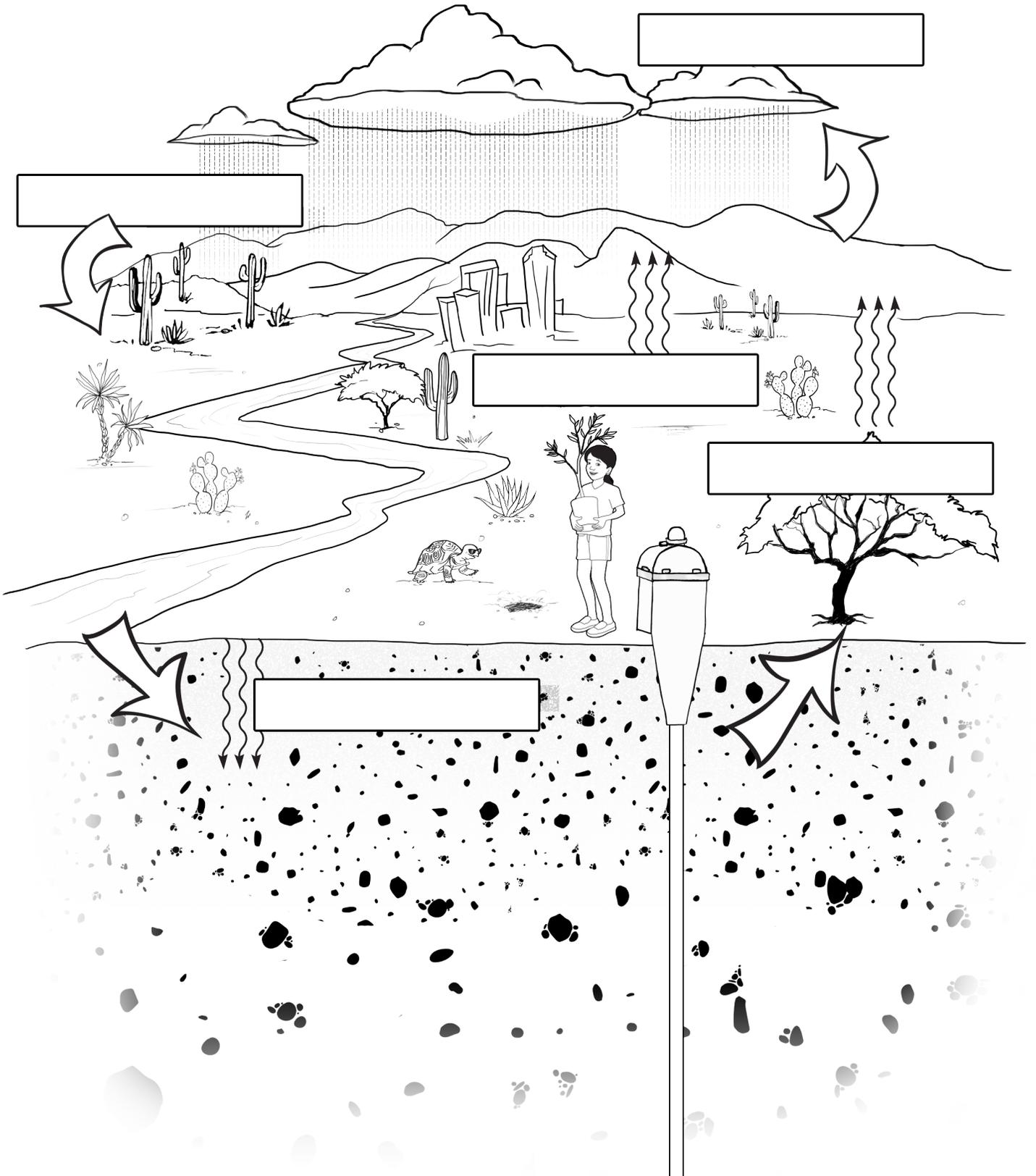


Transpiration: the evaporation of water from plants

Example of transpiration: when a plant or a tree releases water into the atmosphere from tiny openings in its leaves.



Nature's Water Cycle



Answer Key: Nature's Water Cycle

