



The Edwards Aquifer

Barton Springs Tour

TEKS Science: 5.8(D), 5.10(A)

Social Studies: 5.7(B), 9(A, B)

Reading: Students learn academic vocabulary in meaningful context, 5.27(A)

AISS Essential Science Vocabulary

Basin (watershed), environment, drought, pollution, flow, groundwater, extinct

Concept

Hydrogeology and history of Barton Springs

Objective - Students will:

- 1) take a walking tour to identify the three Barton Springs: Parthenia, Eliza and Zenobia;
- 2) locate and describe the flow of water from the Recharge Zone to the Springs;
- 3) observe the entrance and exit of the creek by-pass tunnel and discuss comparisons and contrasts in water quality and temperature between surface and groundwater and;
- 4) compare and contrast historical and present-day Barton Springs.

Time 45 minutes

Materials: Historical photos

Extra Information

- For more information on Barton Springs, visit the website, <http://www.austintexas.gov/department/barton-springs-pool>
- For background history and basic hydrology of Barton Springs read the book, **Barton Springs Eternal**.
- For more in depth information on Barton Springs hydrology, read the general information booklet and secondary Social Studies curriculum prepared by the Barton Springs/Edwards Aquifer Conservation District, 282-8441.
- For an audio tour of Barton Springs, visit <http://www.austintexas.gov/Watershed/YouthEd>

LESSON

INTRODUCTION

- Discuss before entering – “Follow rules of the pool: 1) Walk; 2) Respect pool visitors and employees; 3) Stay clear of equipment; 4) Have fun!”

PROCEDURE

1. **Water Temp** – (Walk down the stairs to the sidewalk adjacent to the deep end.)
Allow the students to lie down on their stomachs and reach into the pool to feel the water. After a minute or so, have the students take a seat on the wall.
“How did the water feel? On a hot day the water will feel cold. On a cold day the water will feel warm. However, the water in the springs in Austin do not warm up or cool down, but stay a constant temperature of 21 degrees Centigrade, which is 70 degrees Fahrenheit. It might feel warm in winter because the air temperature can get so cold, but it is always 70 degrees. This is because the water is traveling underground where it is not exposed to the weather.”

2. **Barton Springs Fault** – (Move to the spot under the large overhanging oak tree.)
 “Look for the large crack in the rock to the right of the lifeguard stand (on the south side closest to the diving board). This is the Barton Springs Fault, one place where water **flows** out of the aquifer into the pool. The largest amount of **groundwater** comes out of the spring located directly north of the lifeguard stand. It is a cave opening located underwater.”
3. **Parthenia Spring** - “Most people call the spring in the pool “the Big Spring.” But those who are familiar with Austin history know that Billy Barton named his springs after his daughters, Parthenia, Eliza, and Zenobia. The spring in the pool is the biggest of the three Barton Springs, so it is named Parthenia, after the oldest daughter.
4. **The Recharge Zone** - (On the dam at the shallow end of the pool, with a view of Barton creek and diversion tunnel entrance.)
 “This spot is the end of the Recharge Zone. The water in the creek **basin** west of here **flows** underground through the cave passages of the Edwards Aquifer to Barton Springs. Because much of the water flows underground through openings in the creek bottom, the creek **basin** in this area is usually dry, except after a heavy rain.”
5. **Diversion Tunnel** - Observe the **flow** of upper Barton Creek into the diversion tunnel. “Is Barton Creek **groundwater** or surface water? (surface water) Why would surface water be diverted around the groundwater in Barton Springs Pool? (Possible answers: Because surface water is exposed to more pollution. Surface Water temperature varies, and groundwater temperature stays the same.)”
6. **Eliza Spring** (historic sunken stadium located behind the concession stand)
 “No, there never were alligators in Eliza Spring, although it is a widespread rumor! It is called the Elks’ Pit because the Elks Lodge used to meet in this stadium to stay cool during times when there was no air-conditioning.” Point out the picture of an elk stamped into the cement wall of the pit.
 “This spring is also protected for the salamander.” Show the students the pictures of the salamander posted on the fence. “The salamander looks big in the picture, but is actually only 1-2 inches and lives in the water its entire life. Barton Springs is the only habitat for this salamander, and it is very sensitive to pollution. As a result, the Barton Springs salamander is endangered of becoming **extinct** if a lot of **pollution** washed through the aquifer. The City works to teach you and others how to protect the recharge area of the aquifer to protect this special species. Those efforts also protect the water for us to enjoy at Barton Springs. You will have an opportunity to see a captive Barton Springs salamander in the Splash! Exhibit.”
7. **Show students the picture of “Sunken Gardens” or “Zenobia Spring, or walk down to the canoe area where you can look across Barton Creek and observe the flow coming under the bridge into Barton Creek from Sunken Gardens.”**
 “Downstream of the lower dam and across the creek is a third Barton Spring. Most people call this spring “Sunken Gardens,” but Billy Barton named it Zenobia. It has also been called “Old Mill Spring” because of Paggi’s Mill that used the spring to mill flour in the early 1900’s. This is one of the three Barton Springs named after Billy Barton’s daughters that has salamanders. ”

Historical Story just for fun...

*Tell students the story of Billy Barton and the Apaches:

“Billy Barton moved to Barton Springs after the Comanches. The Comanches were not happy Billy had moved into their territory, so they would often look for opportunities to get rid of him. One day Billy Barton was out walking his land when he ran into a handful of Comanches. Billy was an older man of about 55, and even though he tried to outrun them, he knew he would soon be caught unless he thought of a better way to escape. So he used his brains instead of brawn. He ran up a hilltop and looked down the other side. The Comanches were still behind him and slightly downhill so they could not see on the other side of the hill. Barton motioned to an imaginary army of friends

to come up the hill and help him fight the Comanches. The Natives, not being able to see over the hill and believing there was an army waiting to capture them, ran in the opposite direction. That is how Billy Barton saved his scalp and became the namesake of Barton Springs. Otherwise the springs could be called Comanche Springs!”

*Source: Barton Springs Eternal, by Turk Pipkin and Marshall Frech

EVALUATION: *Just for fun* - “What were the names of Billy Barton’s three daughters? (Parthenia, Zenobia, Eliza)” *Real test* - “Where does the water in the springs come from? (groundwater or the aquifer) “