

Exploring Aquifers Lesson Seven: “Conducting an Impact Assessment of a Texas Aquifer”

Academic Questions:

What changes have occurred within Texas that are impacting the major aquifers?
What can be done to protect the aquifers?

Objective(s):

- To understand the types of changes within an aquifer watershed which impact the aquifer
- To understand how to assess and evaluate the impact of these changes

Key Terms: aquifer, watershed, alluvium, plateau

[Click here for definitions to Exploring Aquifers vocabulary.](#)

Process (Activities):

1. Ask students, in the same small groups used to build the aquifer models, to research the aquifers in Texas they modeled in [Lesson One: Geology of Aquifers](#). If students were not assigned to specific aquifers, then assign students to study one of the following major aquifers: (1) Ogallala, (2) Gulf Coast, (3) Edwards (BFZ), (4) Carrizo-Wilcox, (5) Trinity, (6) Edwards-Trinity (Plateau), (7) Seymour, (8) Hueco-Mesilla Bolson, and (9) Cenozoic-Pecos Alluvium.

Using the knowledge they gained from the lessons in this unit and the Internet, students should investigate the following questions:

- What is the aquifer made of?
 - What are the boundaries of the aquifer’s watershed?
 - How does water enter and exit this aquifer? Are there any losing streams or sinkholes? What streams are fed by this aquifer?
 - How much water enters the aquifer annually? What can impact how much water enters the aquifer?
 - How much water is stored in the aquifer?
 - How much water is discharged from the aquifer annually? What impacts how much water is discharged from the aquifer?
 - How is the water in this aquifer used (include human and non human uses)?
 - How many communities live within the recharge zone of this aquifer? What is the population of these communities?
 - What is the name of the Regional Water Planning Group that regulates the aquifer?
 - Has this Regional Water Planning Group made recommendations concerning the protection or conservation of this aquifer?
 - What are the major threats to the aquifer?
2. Using the information compiled in their research, ask students the following questions. The population of Texas will more than double from 19 million to 39 million people by the year 2050. All of these new residents of Texas will require a clean reliable source of fresh drinking water. How do you think this population increase will impact your aquifer? What laws would you create if you were responsible for the quality of the aquifer? What people or groups do you think would be opposed to these laws and why would they be opposed. What people or groups do you think would support these laws and why?

Product/Application: Ask students to compile their information into a research report that can be shared with the Regional Water Planning Group and/or posted on the Cyberways and Waterways web site under Big Picture Projects:

<http://www.cyberwaysandwaterways.com/en/bigPictureProject/>.

Assessment/Evaluation: Create a checklist with the students that describes the components of a good research report.

Conclusion: As a final activity, allow student groups to present their information to a mock town council. Students in the audience should be assigned to play different interest groups concerned about the aquifer (include industry, agricultural, environmental, and landowner interest group). Allow each group to generate two questions at the completion of the aquifer group's presentation and hold a question and answer session. After each group has made their presentations, hold a class discussion about what the class has learned and how they can play a role in maintaining the quality of Texas aquifers.

Time Frame: Three 45-minute class periods

Grade Level: 6th-12th

TEKS Correlation:

Science

Grade 6: 6.1, 6.2, 6.3, 6.4

Grade 7: 7.1, 7.2, 7.3, 7.4

Grade 8: 8.1, 8.2, 8.3, 8.4

Aquatic Science: (b)1, 8.B,C

Environmental Science: (b)1, 7.C,D, 8.A

Mathematics

Grade 6: 6.1, 6.8, 6.11, 6.12, 6.13

Grade 7: 7.3, 7.4, 7.9, 7.13, 7.14, 7.15

Grade 8: 8.5, 8.14, 8.15

Geometry: 6

Precalculus: 2

Technology Applications (Computer Literacy)

Grades 6-8: 2, 4, 5, 7, 8

Social Studies

Grade 6 6.21, 6.22, 6.23

Grade 7 7.8, 7.21, 7.22, 7.23

Grade 8 8.10, 8.30, 8.31, 8.32

English

Grade 6: 6.1, 6.2, 6.5, 6.13, 6.17, 6.20, 6.22, 6/24

Grade 7: 7.1, 7.2, 7.5, 7.13, 7.17, 7.20, 7.22, 7.24

Grade 8: 8.1, 8.2, 8.5, 8.7, 8.10, 8.13, 8.17, 8.18, 8.20, 8.22, 8.24

English I: 1, 4, 6, 8, 13, 15, 16, 21

English II: 1, 4, 6, 7, 8, 13, 15, 16, 21