The Meadows Center for Water and the Environment

TEKS CURRICULUM GUIDE
Fourth Grade
The Meadows Center

The Meadows Center Educational Tours mission is to provide people of all ages with the ability to recognize Spring Lake as a unique freshwater ecosystem through interpretative interactive experiences that engages the audience in an exploration of interconnections between all living things and water.

All tours require a two-week advanced reservation, a deposit. Tour dates are not guaranteed until your confirmation notice from The Meadows Center Education Office has been processed. The listed group rates apply to any group of 15 people or more. Prices subject to change without notice. Listed prices are for school groups and non-profit organizations.
Activities for Fourth Grade

1. Glass-Bottom Boat Ride
   Length: 30 minutes
   As students glide across Spring Lake in glass-bottom boats, they have a rare opportunity to see underwater life from a different perspective. View over 1,000 springs that bubble up 150 million gallons a day of clear water from the Edwards Aquifer to form Spring Lake, the headwaters of the San Marcos River. Declared a critical Habitat by the Federal Government in 1980, Spring Lake is the home of several endangered species.

2. Wetlands Boardwalk
   Length: 30 minutes
   Journey over a 1/10 mile floating boardwalk through our wetlands habitat. Students will learn about what wetlands are and what species live in them. Stroll by “Turtle Island” where turtles often sunbathe and birds migrate through.

3. Aquarium and Discovery Hall Exhibit
   Length: 15 minutes
   Students will see live endangered species on display in this new aquarium exhibit.

4. Bug Picking
   Length: 30 minutes
   Participants will conduct an experiment in order to test the quality of the water at Meadows Center based on the bugs they find in their water samples.

5. Wetlands Bug Bingo
   Length: 15 minutes
   This activity goes hand in hand with Bug Picking. Students will learn what different aquatic bugs look like and how to identify them while playing a fun game of “Wetlands Bug Bingo.”

6. All the Water in the World
   Length: 15 minutes
   During this interactive activity, students learn how little fresh water is available for use by all living things.

7. Frog Food Chain Tag
   Length: 15 minutes
   During this interactive game, students pretend to be frogs competing with each other for prey while avoiding the predator herons in our wetlands food chain. What our frogs don’t know is that there is a twist to this game... this wetland habitat has been polluted! How will the frogs survive?

8. Water Conservation Game
   Length: 15 minutes
   This trivia game explores the theme of conserving water. Teams compete to see who can successfully save the most water.
9. Journey of a Water Drop
Length: 15 minutes
Students pretend to be a water drop on a journey through the water cycle.

10. Native American Activity: AtlAtl
Length: 15 minutes
During this activity students will practice the Tonkawa Indian skill of AtlAtl spear throwing.

11. Native American Activity: Cattail Braiding
Length: 30 minutes (Only available March through October)
Learn how the Tonkawa Indians turned the Cattail plant that grows in our wetlands area into rope, then make a piece of jewelry to wear home.

12. Native American Activity: Teepee
Length: 15 minutes
During this activity students will build a teepee. Be sure to bring a camera to take pictures of students inside!

13. Enviroscape 3D Watershed Model Presentation
Length: 30 minutes
Students learn about watersheds, and point and non-point source pollution that affects water quality. Students participate in an activity where they put different types of pollution on the ground of the 3D watershed and see how rainfall creates runoff that carries that pollution into rivers and lakes. (Available for schools with 4 or less classes total)

14. Water Quality Presentation
Length: 30 minutes
Water quality is important for human, wildlife, and ecosystem health. Students will explore a basic water quality testing kit and examine what the results of the test mean for the health of the Spring Lake ecosystem. (Available for schools with 4 or less classes total).
*Corresponds with Texas Aquatic Science lesson 1.9 Student Investigation in Water Quality http://texasaquaticscience.org/

15. Rainwater Model
Length: 30 minutes
Watersheds are everywhere! Students will observe how water interacts with different surfaces through this hands-on model. It brings the sometimes abstract concept of aquifer recharge to the students’ fingertips. (Available for schools with 4 or less classes total).
*Corresponds with Texas Aquatic Science lesson 2.3 Infiltration & Aquifers http://texasaquaticscience.org/

16. Land Use in our Watershed
Length: This is an add on activity that will take place throughout your tour
Hunt for evidence of water. This scavenger hunt activity leads students around the site looking for signs of runoff, erosion, accumulation, or infiltration. This ties into discussions of watersheds, surface water, and aquifer recharge.
*Corresponds with Texas Aquatic Science lesson 3.3 Land Use in Our Watershed http://texasaquaticscience.org/
17. **Competition within Spring Lake**  
Length: 15 minutes  
Your environment is crowded! What happens to your resources? Competition for basic survival needs is a part of living in an aquatic habitat. Many factors influence the amount of resources available for species. This engaging game demonstrates how different limiting factors affect survival rates.  
*Corresponds with Texas Aquatic Science lesson 5.2 Competition within Spring Lake  
http://texasaquaticscience.org/

18. **Food Web Wonders**  
Length: 15 minutes  
Participate in a giant string-web to explore how energy moves in an ecosystem. Species interact through food webs, which require a healthy ecosystem to function. Starting with the sun, energy moves through the natural system from plant to carnivore to decomposer.  
*Corresponds with Texas Aquatic Science lesson 8.3 Where do I Live? What do I Eat?  
http://texasaquaticscience.org/

19. **The Hunt for Biodiversity**  
Length: 30 minutes  
What can we learn from plants? Biodiversity is important to the health of an ecosystem. This activity introduces students to scientific methods (including sampling) and discusses the importance of tall plants growing near a waterbody like Spring Lake. [Available for schools with 4 or less classes total].  
*Corresponds with Texas Aquatic Science lesson 6.3 The Hunt for Biodiversity  
http://texasaquaticscience.org/
### Activity connections with Texas Essential Knowledge Standards (TEKS)

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<thead>
<tr>
<th>4th Grade Science TEKS</th>
<th>Applicable Activities</th>
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<tr>
<td><strong>(4.1) Scientific investigation and reasoning.</strong> The student conducts classroom and outdoor investigations, following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 14, 15, 16, 19</td>
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<td>(A) demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations; and</td>
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<td>(B) make informed choices in the use and conservation of natural resources and reusing and recycling of materials such as paper, aluminum, glass, cans, and plastic.</td>
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<tr>
<td><strong>(4.2) Scientific investigation and reasoning.</strong> The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to:</td>
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<td>(A) plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions;</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 14, 15, 19</td>
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<td>(D) analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured; and</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 19</td>
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<td>(F) communicate valid, oral, and written results supported by data.</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 16, 19</td>
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<td><strong>(4.3) Scientific investigation and reasoning.</strong> The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:</td>
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<td>(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by students;</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9</td>
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(C) represent the natural world using models such as rivers, stream tables, or fossils and identify their limitations, including accuracy and size; and, 13, 15

(D) connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists. 2, 13, 14, 19

### 4.4 Scientific investigation and reasoning
The student knows how to use a variety of tools, materials, equipment, and models to conduct science inquiry. The student is expected to:

(A) collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, mirrors, spring scales, pan balances, triple beam balances, graduated cylinders, beakers, hot plates, meter sticks, compasses, magnets, collecting nets, and notebooks; timing devices, including clocks and stopwatches; and materials to support observation of habitats of organisms such as terrariums and aquariums; and 2, 4, 13, 14, 16

(B) use safety equipment as appropriate, including safety goggles and gloves. 2, 4, 14

### 4.5 Matter and energy
The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:

(A) measure, compare, and contrast physical properties of matter, including size, mass, volume, states, temperature, magnetism, and the ability to sink or float. 15

### 4.7 Earth and space
The student knows that the Earth consists of useful resources and its surface is constantly changing. The student is expected to:

(A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants; 15

(B) observe and identify slow changes to Earth’s surface caused by weathering, erosion, and deposition from water, wind, and ice; 16

(C) identify and classify Earth’s renewable resources, including air, plants, water, and animals; and nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation. 1, 2, 3, 6, 8, 9

### 4.8 Earth and science
The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:

(B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process. 1, 2, 3, 6, 8, 9, 13, 15

### 4.9 Organisms and environments
The student knows and understands that living organisms within ecosystems interact with one another and with their environment. The student is expected to:

(A) investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food; and 1, 2, 3, 4, 5, 7, 17, 18

(B) describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web such as a fire in a forest. 1, 2, 3, 4, 5, 7, 18

### 4.10 Organisms and environments
The student knows that organisms undergo similar life processes and have structures that help them survive within their environment. The student is expected to:

(A) explore how adaptations enable organisms to survive in their environment such as comparing birds’ beaks and leaves on plants; 1, 2, 3, 4, 5, 7, 17

(B) demonstrate that some likenesses between parents and offspring are inherited, passed from generation to generation such as eye color in humans or shapes of leaves in plants. Other likenesses are learned such as table manners or reading a book and seals balancing balls on their noses; and 1, 2, 3, 4, 5, 7

(C) explore, illustrate, and compare life cycles in living organisms such as butterflies, beetles, radishes, or lima bean. 1, 2, 3, 4, 5, 7

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### 4th Grade Social Studies TEKS

**Applicable Activities**

(4.1) History. The student understands the origins, similarities, and differences of American Indian groups in Texas and north America before European exploration. The student is expected to:
(A) Explain the possible origins of American Indian groups in Texas and North America; 10, 11, 12

(B) Identify American Indian groups in Texas and North America before European exploration such as the Lipan Apache, Karankawa, Caddo, and Jumano; 10, 11, 12

(C) Describe the regions in which American Indians lived and identify American Indian groups remaining in Texas such as the Ysleta Del Sur Pueblo, Alabama-Coushatta, and Kickapoo; and 10, 11, 12

(D) Compare the ways of life of American Indian groups in Texas and North America before European exploration. 10, 11, 12

(4.10) **Economics.** The student understands the basic economic activities of early societies in Texas and North America. The student is expected to:

(A) Explain the economic activities various early American Indian groups in Texas and North America used to meet their needs and wants such as farming, trading, and hunting. 11

(4.19) **Culture.** The student understands the contributions of people of various racial, ethnic, and religious groups in Texas. The student is expected to:

(B) Identify customs, celebrations, and traditions of various cultural, regional, and local groups in Texas such as Cinco de Mayo, Oktoberfest, the Strawberry Festival, and Fiesta San Antonio. 10, 11, 12

**Additional Materials**

Additional information on water education can be found on the Texas Aquatic Science website at [http://texasaquaticscience.org/](http://texasaquaticscience.org/). This website provides additional learning opportunities and materials for a variety of subjects concerning water, including “Water is Life”, “Water for the people and the Environment”, “Bays and Estuaries”, and many others.
Frequently Asked Questions

How do I book a group tour?
You may book a tour online at www.meadowscenter.txstate.edu/Education/EducationalTours/TourReservationForm. If you have questions please call 512-245-7540. Our office hours will vary depending on park traffic, so please leave a message and we will call you back.

How far in advance should I book my tour?
We require two weeks advance notice for group tours. Please remember the days during March through August can fill up several months in advance, so please book your tour as soon as possible.

Do you have a maximum number of students that can attend the field trip?
There is not a set maximum number of students per field trip. Your tour-booking agent will discuss the best activities for your group’s size when you book your tour. We recommend booking your tour early for best choice of dates.

Do you have a minimum number of chaperones required?
One teacher per class is sufficient for our tours. The one required adult should never leave the group alone with the tour guide. You may choose to bring additional teachers and parents if you wish (please check your tour confirmation for fee information). The boats will comfortably seat 25 people each, so additional adults may need to ride on a separate boat than the rest of the group.

What age groups are your programs appropriate for?
All ages. We customize our programs for your group.

I would like to do something different than listed on your website, can you accommodate my group?
We try our best to accommodate special requests.

Do I need to book a specific time for my tour?
Yes, you will book a specific date and time for your tour. Please arrive 15 minutes prior to the start time of your tour. We apologize that we are unable to push back the start times of tours. If your group is late we may need to cut a portion of your tour time. Please call 512-245-7570 and push 0 to notify us that you will be late.

What if it rains?
If it rains on your tour date you will have the option to reschedule. Please call 512-245-7570 and push 0 on the day of your tour and let a staff member know that your group will not be coming. The boats are enclosed and will still run unless there is lightning. We have limited indoor space so please dress for the weather if it is raining on your tour date.

Booking a Tour
Go to www.meadowscenter.txstate.edu/Education/EducationalTours/TourReservationForm.
Web: www.MeadowsWater.org
Phone: (512) 245-7540