



MUSEUM OF  
**NATURE &  
SCIENCE**  
DALLAS, TEXAS

# Teacher's Guide 2009-2010

Pre - K to 12th Grade

## 4th Grade:

### Adapt to Survive

Students will learn about physical and behavioral adaptations that enable animals to live in many diverse Texas ecosystems. Various taxidermy specimens, skulls, shells, and other objects will be used to engage students in a lively discussion for this program.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-60 students at MNS, 15-30 students at your school

*Available at MNS or your school*

### **TEKS**

4<sup>th</sup> Grade: 1b, 2abf, 3ad, 4a, 9abc, 10ab

### Air and Weather

In this program, students will explore the water cycle and discover the many types of weather. A Van der Graff generator will provide kids with the “shocking” facts about lightning. Your students will also learn how clouds are formed and the explosive power of tornadoes. Hands-on experiments will demonstrate air pressure and student volunteers will be asked to join our educator ‘on stage’ as an assistant meteorologist.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-60 students

*Available at MNS only*

### **TEKS**

4<sup>th</sup> Grade: 1a, 2a, 3acd, 4ab, 5ab, 8b

### Animals in the Ancient Alphabet

Students will explore the culture and hieroglyphic alphabet of ancient Egypt with a special emphasis on the animal symbols. The importance of these animals to the Egyptians will be investigated through comparisons of the animals’ roles in the natural world. A selection of mounted specimens from the Museum’s collections will be displayed and discussed, and students will create a bookmark with their name in hieroglyphics to take home.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

### **TEKS**

4<sup>th</sup> Grade: 1a, 3a



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## **CSI: Diamond Heist**

A diamond necklace was stolen! Who had the motive and opportunity? Your students will become forensic scientists and use fingerprints, footprint identification, fragment analysis and other critical deductive reasoning skills to solve the crime.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

## **TEKS**

4<sup>th</sup> Grade: 2adef, 3a, 4a

## **CSI: Dog-napping**

Someone has taken the dog show champion, Manny, from his dog kennel and is holding him for ransom. The dog-napping happened the night after his 1<sup>st</sup> place win in the North Texas Dog Show, where he won a \$50,000 prize and a trophy. The dog-napper is demanding the \$50,000 prize and the trophy in exchange for the dog's safe return! We need your students to help us solve this crime through deductive reasoning by analyzing hair and DNA samples to figure out which of four suspects is the guilty party!

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS only*

## **TEKS**

4<sup>th</sup> Grade: 2adef, 3a, 4a

## **CSI: Mystery Dot**

Mrs. Parker, the 6<sup>th</sup> grade English teacher, knows someone looked at her grade book while she was out of the room. There was a small black smudge that she knew wasn't there before – and she needs to know who left it there! Students will learn about matter and mixtures while using paper chromatography to solve the mystery and determine exactly who looked in Mrs. Parker's book. Was it Laura, Stacey, Derek or Paul? Only you will know!

**Duration:** Standard 50-minute Classroom Program

**Class size:** 15 – 30 students

*Available at MNS or your school*

## **TEKS**

4<sup>th</sup> grade: 1a, 2abdef, 3a, 4a, 5ac



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## **CSI: Toxic Pond**

Nick's Dog, Baxter, was sick all night. The next day Nick took Baxter to the vet. After a series of tests the vet determined that Baxter was suffering from an over exposure to some type of acid. In this "whodunit", students will use deductive reasoning and experimentation to determine pH and figure out which contaminated water supply made Baxter sick. Students will use different methods to test pH including hand held, Vernier digital pH probes in order to have a hands-on role in solving this chemistry mystery!

**Duration:** Premium 90-minute Classroom Program

**Class size:** 15-30 students

Available at MNS or your school

## **TEKS:**

4<sup>th</sup> Grade: 1ab, 2abd, 4ab

## **Digitalis® StarLab**

We will bring the stars to you with our state-of-the-art digital portable planetarium. Students will be guided through their discovery of constellations the immense size of the universe. They will explore star movement, color and brightness, and learn how to locate stars and constellations. This program is well suited for both cultural and scientific studies.

**Duration:** 50 minutes

**School fee:** \$350 (up to 3 programs)

**Attendance:** 10 - 30 students (depending on students' age)

**Requirements:** large air-conditioned indoor room with dimensions of at least 25 ft. X 25 ft and 13 ft. overhead clearance; 110 V electric outlet.

*Available at your school only*

## **TEKS**

4<sup>th</sup>: 1a, 2af, 3acd, 8c

## **Exploring the Past: The Archaeology of Texas**

Imagine a world with no supermarkets, restaurants or electricity! Discover how the first naturalists survived in Texas thousands of years ago using their extensive knowledge of our natural resources. Realistic replicas of American Indian artifacts including clothing, tools, food sources and instruments will be shown and discussed in this hands-on interactive program.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

## **TEKS**

4<sup>th</sup> Grade: 2f, 3ad, 10a



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## **Fossils: Clues to the Distant Past**

Follow the eras of geologic time from trilobites to dinosaurs to mammals with authentic fossils and casts. Students will learn the steps in fossilization, what materials most often fossilize, and what fossils can reveal.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

### **TEKS**

4<sup>th</sup> Grade: 2adf, 3ad, 10a

## **LEGOs®: Simple Machines**

In this hands-on array of guided activities, students will learn all about simple machines and what makes them...not always so simple. By building with LEGO® blocks to construct levers, fulcrums and other machines your kids will walk away with a stronger understanding of what 'mechanical advantage' really means!

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-25 students

*Available at MNS or your school*

### **TEKS**

4<sup>th</sup> Grade: 1a, 2af, 6ad

## **Life in and Around the Pond**

Explore the water of our very own urban pond, the Leonhardt Lagoon, and search for the plant and animal life that live here. Using handheld magnification tools, binoculars, and field guides students will observe a world of microscopic aquatic creatures and study their place in pond ecology. This program is conducted primarily outside so dress accordingly. Program will be adapted in case of inclement or unseasonably cold weather.

**Duration:** Premium 90-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS only*

### **TEKS**

4<sup>th</sup> Grade: 1a, 2a, 3a, 4a, 9ab, 10a



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## Look Out: The Eye

Discover the inner workings of the eye and vision. By dissecting a cow eye, students will see how an eye works. Comparing cow and human eyes will provide "insight" into differences and similarities among species. This program is customized for each grade level and is adapted to meet your class needs.

**Duration:** Premium 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

## **TEKS**

4th Grade: 1a, 2a, 3a, 4ab

## Measure Up to the Mavs: The Human Catapult – NEW!

Presented by ExxonMobil

Grades 4-6

How do the Mavs launch three-pointers? Is there physics on the basketball court? In this program, students will build wooden catapults and shoot miniature basketballs at a goal...all in the name of helping them understand mechanics and the three classes of levers. By analyzing their accuracy data and using what they learn from these simple machines, students will be able to compare catapults to the structure of a human arm to find out just what makes the Mavs so great!

**Duration:** Standard 50-minute Classroom Program

**Class size:** 15 – 25 students

Available at MNS or your school

*If held at MNS, one adult free for each 10 kids; additional adults are charged the group rate if they sign up with the school group.*

## **TEKS:**

4th: 1a; 2bcdf; 3ac; 4ab; 6a

5th: 1a; 2cdf; 4ab; 6a

6th: 1a; 2de; 3b; 4ab; 8ab

## Mineral Mystery

It's the case of the imposter mineral – or is it? Students will become detectives and solve this Mineral Mystery by delving into a locked box, tricky riddles and clever codes, and precious metals and gems to uncover the truth about precious metals and gems. Once they have broken the code they will identify minerals by the properties of hardness, streak, color and fluorescence to determine if the treasure is real or fake.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-30 students

Available at MNS only

## **TEKS**

4th Grade: 1a, 2adef, 3a, 4a, 5a



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## **Moments in Time: An Archaeological Investigation**

Students will work as archaeological "lab techs" to interpret the history and meaning of artifacts covering 12,000 years of human life from a site near Texas A&M University. The hands-on analysis of the artifacts will allow them to explore human technological advances through time.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

### **TEKS**

4<sup>th</sup> Grade: 2f, 3ad, 4a, 10a

## **Pleistocene Puzzle NEW**

Could some mammals have been victims of a cosmic impact? Almost thirteen thousand years ago, many large mammal species died out in a major extinction. Using hands-on, inquiry methods, students will recreate impact craters to investigate this event and attempt to offer a solution to the mystery.

**Duration:** Standard 50 minute program

**Class Size:** 15 – 30 students

*Available at MNS or at your school*

### **TEKS**

4<sup>th</sup> grade: 1a, 2abdf, 3c, 4a

## **Pump Up: The Heart**

Explore the fascinating world of the heart through this hands-on guided dissection of a pig heart! Students will have an up-close encounter with real hearts as they learn about heart structure and function as well as the need to stay healthy. If you want students to learn about their heart, this program can't be "beat"! This program is customized for each grade level and is adapted to meet your class needs.

**Duration:** Premium 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

### **TEKS**

4<sup>th</sup> Grade: 1a, 2a, 3a, 4ab



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## **Rockin' Through Texas**

Discover the earth through its geologic past. Students will have the opportunity to examine the differences between rocks and minerals. This program also includes a close look at the geology of Texas with its many land formations and the effect on the flora and fauna of the state and fossil fuel resources.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS only*

### **TEKS**

4<sup>th</sup> Grade: 1a, 2af, 3ac, 7bc

## **Texas Ecosystems**

Take close-up look at the state's diverse ecosystems ranging from shoreline to forests and mountains. Emphasis will be on the Blackland Prairie, considered the most endangered large ecosystem in North America. The Museum's original dioramas will help students understand how this land once looked and serve as a comparison for today's modern world.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-60 students

*Available at MNS only*

### **TEKS**

4<sup>th</sup> Grade: 1b, 2b, 3a, 4a, 7c, 9ab

## **Urban Nature Walk **NEW****

Join one of the Museum Naturalists for a guided walk in our own backyard! With the aid of field guides and binoculars, students will identify and learn about urban wildlife, explore various habitats and learn about the diversity of life within the confines of the Metroplex. This program can be adapted for all grades and helps to reinforce food webs, pond ecology, adaptations and biodiversity. The nature walk is available any season; please dress accordingly.

**Duration:** Standard 50-minute outdoor program

**Class Size:** 15-25 students

*Available at MNS only*

### **TEKS**

4<sup>th</sup> Grade: 1a, 4a, 9ac



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## **Water Cycle: Basics of Life **NEW****

Explore the water cycle like never before!! Your students will become citizen scientists and collect real data used in monitoring the water quality of the Trinity River watershed and learn how to become better stewards of our most precious resource by discussing how humans affect the urban water cycle in our own backyards. Hands on experiments will include measuring water transparency, dissolved oxygen, pH and water temperature.

**Duration:** Premium 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS only*

### **TEKS**

4<sup>th</sup> Grade: 1ab, 2ad, 3a, 4a, 7bc, 8b

## **Geology Residency**

Over the course of this program, students will unearth the facts about minerals, the Mohs scale of hardness, the rock cycle and the three types of rocks. Students will engage through hands-on activities involving rock samples, minerals and testing tools.

**Duration:** Three 50-minute classes

**Class Size:** 15-30 students

*Available at your school only*

### **TEKS**

4<sup>th</sup> Grade: 1a, 2adf, 3acd, 4a, 7abc

## **RESIDENCY PROGRAMS**

### **Digging Deeper: An Archaeology Residency**

This program will focus on the science that supports historical archaeology through a series of activities that simulate the work done by professional archaeologists. Students will discover the types of artifacts most commonly recovered, the techniques available for interpreting artifacts and some of the questions that are raised by archaeological studies. All of the activities will require students to employ higher level thinking skills such as evaluation, problem solving and application.

**Duration:** Three 50-minute classes

**Class Size:** 15-30 students

*Available at your school only*

### **TEKS**

4<sup>th</sup> Grade: 1a, 2adf, 3acd, 4a, 7b, 10a



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## Paleontology Residency

During this program, students will gain a deeper understanding of the field of paleontology including field and lab methods used by scientists to uncover and preserve the remains of ancient samples. Geologic time, fossilization and dinosaurs will be explored in this interactive residency. Students will take home small invertebrate fossils.

**Duration:** Three 50-minute classes (can also be done as 3-day workshop)

**Class Size:** 15-30 students

*Available at your school only*

## **TEKS**

4<sup>th</sup> Grade: 1a, 2adf, 3acd, 4a, 7b

## AUDITORIUM PROGRAMS

### Electric Theater

Explore the world of electricity and magnetism through this exciting (and “shockingly” cool) demonstration led by one of our Museum educators. Student volunteers will join our presenter on stage to demonstrate the workings of Van der Graff generators, electromagnets, step-down transformers, Tesla coils and more!

**Duration:** 50 minutes

**Class Size:** 15-175 students at MNS, 30–250 at your school

*Available at MNS or your school*

## **TEKS**

4<sup>th</sup>: 2ab, 3a, 4a, 6ab

### Fire and Ice

This explosively entertaining program teaches about the states of matter in a unique way. Student volunteers help the presenter explore how temperature affects matter. Both physical and chemical changes are demonstrated using fire and liquid nitrogen.

**Duration:** 50 minutes

**Class Size:** 15-175 students at MNS, 30–250 at your school

*Available at MNS or at your school*

## **TEKS**

4<sup>th</sup>: 1a, 2ab, 3a, 4ab, 5ab, 6a