Paving the Way for STEM in History Museums

TEXAS HISTORICAL COMMISSION
REAL PLACES TELLING REAL STORIES

BEYOND THE ROAD

BULLOCK TEXAS STATE HISTORY MUSEUM
Becoming a Habitat for Teachers: Designing Educator Workshops with STEM in Mind
Workshop Goals

By the end of this webinar you will:

- Understand how to create engaging and useful teacher programs and resources that can be used on-site and online
- Explore how to build connections with teacher audiences and how to design and execute multidisciplinary educator workshops of several different formats
- Practice program planning skills that can be applied at your site
- Walk away with examples of how STEM can be incorporated into teacher programs at history-based sites
Why focus on the teacher and student audiences?

- Mission Critical
- Field Trip Attendance
- Trusted source of learning; exposure to primary sources
- Impact Numbers
History Museums and STEM—why go multidisciplinary?

- Adds to your interpretation
- Ties into the stories of people/being human
- History connects to everything else
- Helps teachers create well-rounded learning
STEM Connections

- STEM Connections in your Collection
- Connect to Community Issues
Making Connections with Teachers

- Direct connections with Region and District Leaders
- Visibility at community events
- Online resources
- Professional Development events
Regional and District Leaders

ESC Map: https://tea.texas.gov/about-tea/other-services/education-service-centers/education-service-center-map
Regional and District Leaders

- Instructional Specialists, Curriculum Coordinators, Curriculum and Instruction, instructional Support, Resource Specialists, Teaching and Learning Dept, etc.

- School District Locator: [https://tea-texas.maps.arcgis.com/apps/webappviewer/index.html?id=51f0c8fa684c4d399d8d182e6edd5d97](https://tea-texas.maps.arcgis.com/apps/webappviewer/index.html?id=51f0c8fa684c4d399d8d182e6edd5d97)
Regional and District Leaders

- Regional Education Service Centers
- District Curriculum Leaders

- Partner and put on joint programs together
- Attend their meetings
- Contribute to their staff newsletters
- Advisory groups
Visibility at Community Events

- Be a “table” at educational (or social) events in town
  - Library programs
  - Festival days
  - Parent nights
  - Community “Back to School” events
Visibility at Community Events
Online Resources

Activity Guides

Activity guides help students focus on specific topics and skills during their Museum visit.

All Grade Levels

Making a Living Activity Guide
What jobs have Texans done over time, and how has the state’s geography influenced which industries grew here? How have trade and new industries shaped the economy of Texas? Find out by using the Making a Living Activity Guide. Explore the Texas History Galleries, looking closely at the artifacts and following the guide as it leads your students through six activities in the museum.

- Making a Living
- Making a Living Teacher Guide

Artifact Adventure
Send your students on an adventure to find an artifact in the museum, and learn how to analyze it like a historian.

- Artifact Adventure

Find and Sketch
As they visit the Museum galleries, your students become artists by sketching artifacts that represent thematic topics. Later, enjoy using their sketches in various ways in your classroom.

- Find and Sketch!
- Find and Sketch! (Spanish), Encuentra y Dibuja!

https://www.thestoryoftexas.com/education/educators/activity-guides
Online Resources

**On-Demand Tools:**

Use these online curriculum resources anytime in your classroom.

- **Campfire Stories:** Interact with Texans gathered around a campfire to share their stories. Students will discover how people shape Texas's past and future.

- **Texas History Timeline:** Let your students travel through the past in a sweeping journey through Texas history.

- **Interactive Artifact Gallery:** Examine curriculum-related Texas artifacts with an interactive gallery featuring hundreds of Museum objects.

- **Digital La Belle Exhibition:** The shipwreck La Belle is brought to vivid life for your classroom. Watch videos and reinforce learning with hands-on activities.

- **Virtual Texas Capitol:** A clickable Capitol feature allows students to explore the building as well as their roles in Texas government.

- **The Texas Story Project:** An authentic research and writing opportunity that encourages students to investigate and share their own Texas stories.

- **Distance Learning Programs:** Bring the Museum to your classroom through live, interactive distance learning programs. Connect with a Museum Educator for a Texas History lesson.

- **On-Demand Videos:** Check out the Bullock Museum’s YouTube page for videos about how exhibitions are made, get a behind-the-scenes glimpse into the Museum, and join in storytime and craft programs.

[https://www.thestoryoftexas.com/education/educators/curriculum-tools](https://www.thestoryoftexas.com/education/educators/curriculum-tools)
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Online Resources--Tips

- Avoid large notebooks
- Keep lesson flexible, more of an idea than a rigid structure
- Talk to teachers!
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Title: Saving a Ship

Theme:
Using problem solving and experiments with new technology, scientists brought back to life a ship once believed forever lost to history.

Primary Objective:
- Science and history work together in this story.
- Archeologists had to be problem solvers and try new excavation and conservation methods.
- "Artifact conservation is twofold. It's science and it's artistry." Helen DeWart, Chief Conservator
- Mysteries about objects found with the ship were solved by investigative scientific and historical research. (concretions=iron bar originally inside; La Belle plans and Roman numeral markings=kit ship)

Objects to be used:
- concretion around iron bar
- jar of Polyethylene Glycol (PEG)
- trenails (modern wood and fiberglass)
- photo of French naval ledger
- From a Watery Grave
- La Belle: The Ship that Changed History Catalog

Guiding Questions:
- Organic material dissolves over time, especially underwater. Why didn’t the ship deteriorate?
- Have you ever put something together using instructions?
- How would you put this ship back together? What clues could help you figure it out?
- What was inside this concretion? What shape do you see? Can you find this shape in that case?

Talking Points:
Experiments with new technology helped save La Belle and gave new knowledge to marine archeology and artifact conservation methods.

Excavation
- In 1995, archeologists found the ship in about twelve feet of silty water. A massive watertight cofferdam enclosure was built around the wreck to allow archeologists to pump out all the water surrounding the ship, and excavate the ship on dry land.

Preservation

BULLOG MUSEUM
La Belle in the Classroom

Lesson 2: Navigating to North America

Overview
Inaccurate maps and the inability to navigate caused La Salle to miss the mouth of the Mississippi River. During this lesson students will retrace La Salle’s route to North America, compare navigational tools used in the past and present, and navigate a route using a compass.

TEKS
- 111.15 – Social Studies, Grade 4
  - 4.2A, 4.2B
  - 4.19A, 4.19B, 4.19C
  - 4.20A
  - 4.21A, 4.21B, 4.21C, 4.21D
  - 4.22
- 111.15 – Science, Grade 4
  - 4.3C
  - 4.4
- 111.19 – Social Studies, Grade 7
  - 7.2B
  - 7.19A
  - 7.20A, 7.20B, 7.20C
  - 7.22A, 7.22C

Objective
Students will:
- Compare navigational tools from the past and present.
- Follow directions to trace the route La Salle and his crew traveled from France to Matagorda Bay.
- Write and follow directions using a compass.

Materials
- Navigation Tools and Instruments
- Mapping La Salle’s Voyage directions
- Mapping La Salle’s Voyage student map
- Mapping La Salle’s Voyage teacher map
- red pencils
- compasses

Online Resources
- La Belle: The Ship That Changed History
  - http://www.thestoryoftexas.com/la-belle
- La Belle: The Ship That Changed History Artifacts
  - http://www.thestoryoftexas.com/la-belle/the-exhibit/artifacts

Procedure

Engage Students: Compare Navigation Tools

1. Ask students if they have ever had to travel somewhere without knowing the directions. Discuss and list the tools that can help someone navigate such as GPS and maps.

2. Ask students to identify the tools they think La Salle would have used to navigate from France to North America. List students’ responses.

3. Explain that scientists found navigation tools when La Belle was excavated. Show the Navigation Tools and Instruments images and descriptions. Ask and discuss:
   - Which tools do you think scientists found on La Belle? Scientists found the nocturnal, brass compass, sand glass, and lead sounding weight. Even though the magnetic compass had been invented, scientists did not find one on La Belle.
   - Which tools do we use today? Students may identify maps, magnetic compass, and GPS. Discuss where and how students have seen GPS used.
   - How would modern instruments have helped La Salle complete his mission to find the mouth of the Mississippi? Modern instruments, such as GPS, would have helped La Salle to sail to the correct location to find the mouth of the Mississippi River. This could have changed the outcome of the expedition and France’s claim on North America.

Explore Concepts: Trace La Salle’s Route

1. Place students in groups of two. Give each group a copy of Mapping La Salle’s Voyage map and directions.

2. Students follow the directions to trace the route La Salle took to find the mouth of the Mississippi River in 1664.

3. Groups share and compare their completed maps. Display Mapping La Salle’s Voyage teacher map on the projector. Ask and discuss:
Making Connections with Teachers

Why did you like these activities? How will this workshop help you in your classroom?

I got a lot of ideas. Your PD always recharges me because you respect teachers.

I really appreciate how you treated us like rock stars tonight!

— Ana L., Sanchez Elementary
Professional Development Events—CPE Provider

The following entities may provide CPE activities for educators once approved as a CPE provider. They must submit the CPE Provider Registration Application to the Texas Education Agency:

- Professional membership associations or non-profits that have offered professional development in Texas for at least five years and have tax-exempt status, or a state association affiliated with a national association with a tax-exempt status. Submit Sections A & B of the application.
- Private companies, private entities, and individuals. Submit the entire application.

TEA-Approved CPE Providers List

Certificate of Participation

Attended the Evening for Educators: Becoming Texas Professional Development on Wednesday, April 3, 2019

Margaret Koch
Director

Kaitlin Lloyd
School Curriculum Manager

This workshop is approved by the Texas Education Agency for 2.5 hours of Continuing Professional Education
CPE Provider #501119

BULLOCK TEXAS STATE HISTORY MUSEUM  THESTORYOFTEXAS.COM
Professional Development Events—CPE Provider

CPE Provider Requirements

All CPE providers must create their own documentation system (TAC §232.21 (b) & (c).

At the conclusion of each activity offered for CPE credit, the provider or sponsor must provide each educator in attendance written documentation listing, at a minimum, the following:

- CPE provider's name and provider number (CPE provider number for school districts, charters, private schools, and institutions of higher education is their assigned County/District number)
- Educator's name
- Date and content of the activity
- Number of clock hours that count toward satisfying CPE requirements

Professional Development Events—Formats

- General Museum Orientation
- Smaller, Focused Workshops
- Large, Open House Events
Discovering History through Artifacts

How can you use hands-on artifacts in your classroom to excite students about a topic? How can close observation encourage students to see beyond the obvious? In this FREE workshop about artifact analysis, learn step-by-step teaching techniques, practice identifying "mystery objects" and search through museum exhibitions to find connections to historical topics. Gain skills in using artifacts to connect social studies to other subject areas, and learn helpful hints in building your own classroom artifact collection.
General Museum Orientation

Artifact Adventure
Pick an artifact. Where in the museum is the artifact?

Section:

Describe the artifact
Type of material artifact made from:
- Metal  - Wood  - Stone  - Leather
- Cotton  - Paper  - Plastic  - Other:

How the artifact looks and feels:
(shape, color, texture, size, weight, movable parts, anything written on it)

Sketch the artifact or take a photograph to add later

Uses of the artifact
What might it have been used for?

Where might it have been used?

Who might have used it?

When might it have been used?

What does the artifact tell us?
What does the artifact tell us about the culture it was used in?

What does the artifact tell us about the owner or the maker?

Is there a similar item used today?

The Bullock Texas State History Museum  ★ www.TheStoryofTexas.com
Smaller, Focused Workshops

- Structure
- Workshop Elements
- Sample Outlines/Agendas
- Logistical Consideration
- Tips
Smaller, Focused Workshops
Smaller, Focused Workshops

What did African Americans do to make their voices heard during the Civil Rights Movement?
Smaller, Focused Workshops
Smaller, Focused Workshops
Smaller, Focused Workshops

**FROM GRASSROOTS TO GOVERNMENT EDUCATOR WORKSHOP EVALUATION**

**What grade level do you teach?**
- Elementary School
- Middle School
- High School

Subject ____________________________

**How did you hear about this program?**
- Museum Star Educator e-Newsletter Email
- LBJ Library Newsletter
- Word of Mouth
- Bullock Museum Website
- LBJ Library Website
- Other ____________________________

**What were you most interested in or enjoyed the most at this program?**
- Voting Rights presentation
- Exploring the exhibit
- Historical Inquiry Question activity
- Collecting resources
- Dissecting a Photo activity
- Mississippi Burning Investigation activity
- Collaborating with your fellow teachers
- Other ____________________________

**Why did you like these activities? How will this workshop help you in your classroom?**

**What could have been improved at this workshop?**

**What topics or activities would you like to see at future professional development workshops?**
Smaller, Focused Workshops

**Flight of the Butterflies**

**TEKS connections/Activity Ideas**

**Region 13 Science Teacher Workshop**

**Connections to Science TEKS**

- Life Cycle (metamorphosis, insect anatomy)
  - Structures and functions 1.10.A.C.D. 1.20.C. 5.91. 5.10.A.
- Adaptations
  - 7.D
- Scientific Inquiry
  - 7.2.A
- Habits of Mind—perseverance/effort/passion
- Scientific Process, took years
- Evolution by natural selection
  - 7.D
- Problem solving (tagging)
  - Communication (letters, phone, newspapers)
- People, impact on environment (ex. positive—butterfly garden; negative—habitat ruined)
- Migration, adaptation
- Hypothesis into theory
- Geography of North America

**Activity ideas**

- Create a bug/insect, make offspring, using traits, make a lifecycle based on characteristics, complete/incomplete metamorphosis
- Model of a life cycle using pasta (lentil, spiral, shell, bowtie)
- This focuses on the structure. Add in a discussion about the function of each stage
- Venn diagram comparing frog and butterfly, or moth and butterfly
Smaller, Focused Workshops

Table Talk:

1. How and why did wings evolve? What environmental pressures influenced the evolution of wings?
   Apply your knowledge of adaptation to predict how wing characteristics inform an organism’s behaviors including looking for food, mates, shelter, defense.

2. Flight, whether airplanes or organisms, must utilize the four forces of flight: lift, thrust, gravity, and drag. Analyze how size and shape of different organisms’ wings provide lift, power, and maneuverability in the air.

3. Lessons written for Conquest of the Skies are designed to develop the student’s content knowledge.
   What TEKS address evolution at your grade level?
   What TEKS address forces of flight?

4. How do the Key SKILLS addressed in Conquest of the Skies: Science and Engineering Practices, Critical Thinking Skills, and Environmental Literacy, incorporate AIDOS 6 Cs?
   critical thinking
   collaboration
   creativity
   cultural proficiency
   communication
   connection

1. Our success as a nation and as a global society is contingent upon how well we design and invent. But students consistently rank engineering of lower interest than science or other STEM topics. How can you make engineering more appealing to your students? How can you inspire the next generation of engineers?

2. Lessons written for Dream Big [http://www.dreambigfilm.com/education/] are designed to develop the student’s ability to approach problems with the engineering mindset and create a solution. What TEKS address engineering at your grade level?

3. The engineering and design process centers around creating a solution to meet a need or solve a problem present in society. How does the engineering design process incorporate AIDOS 6 Cs?
   critical thinking
   collaboration
   creativity
   cultural proficiency
   communication
   connection

4. “If there is a 10 year-old girl in the audience thinking, ‘I have ideas, too,’ we want to not only inspire her but give her a chance to learn more and keep going.” Greg McGillivray, Director
   How will you build engineering lessons to ensure equity for all students?
Smaller, Focused Workshops
Smaller, Focused Workshops
Large, Open House Events

- Structure
- Workshop Elements
- Sample Outlines/Agendas
- Logistical Consideration
- Tips
Large, Open House Events
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- Community Partners to provide expertise, resources, and create a connection for teachers with another group in their community that they can use as a resource
Pandemic Interlude

TOTALLY TEXAS IMMERSION: PROFESSIONAL DEVELOPMENT

Programs

June 26, 2019 - June 27, 2019
If you are new to Texas History or need to brush up your skills, join us for a FREE Totally Texas Immersion Professional Development.

Event Details

The Bullock Texas State History Museum and the Texas General Land Office are joining forces to offer a FREE, fun, and eventful learning experience especially developed for teachers new to 4th and 7th grade Texas History. This content-driven Texas History immersion will prepare educators for a full year of teaching our state history and geography. Guest presenters will share their subject-area expertise and explore different teaching strategies. Guest presenters will join us from the Texas Historical Commission, Austin ISD, Vernon ISD, Round Rock ISD, the Alamo, and the National Parks Service. Teachers will start the school year prepared with lessons, books, visuals, materials, and the confidence to teach a new subject.

This program is open to teachers of all districts. We will meet from 8:00 am - 4:30 pm on Wednesday and Thursday, and CE certificates will be provided. Space is limited; if you register but then find you are not able to attend, please contact us immediately so we may give your spot to another teacher.

Lunch is on one’s own at the Story of Texas Cafe at the Museum. Parking is complimentary in the Bullock Museum’s garage.
Pandemic Interlude

BECOMING TEXAS EDUCATOR WEBINAR SERIES: WHEN DID THE STORY OF TEXAS BEGIN?

Online Program

July 8, 2020 1:00pm - 3:00pm

Educators, join us for a FREE professional development webinar. Connect with us virtually for a three-part summer webinar series to explore the Museum's recently renovated first floor history gallery, Becoming Texas, which highlights the pre-1821 history of Texas with the most contemporary research of our past.

Pandemic Interlude

Barometer Activity

Success

Gold

Why?

Failure

Why?

Marketing

- What to do when you already have a teacher audience
- What to do when you don’t already have a teacher audience
- (SEO) tips
- Group work
Marketing

https://www.eventbrite.com/e/educators-night-tickets-70824659463#
Making Connections with Teachers

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  - Smaller, Focused Workshops
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STEM Connections

- Teacher Program Planning
- TxDOT Partner Resources
- Biology and Environment: Bats and their Habitats
- How connect to STEM? Connect to Community Issues
STEM Connections
Join Us for An Activity!

Now that you’ve explored some different options for teacher workshops, join us to practice planning a program. Using bat habitat resources from TxDOT and a step-by-step program planning strategy, you’ll work with a team to develop an engaging teacher professional development session that incorporates STEM.

**Thursday, June 17** at 2pm or **Friday, June 18** at 10am

Tell Us About Your Own Work!

Bring your institution’s STEM-based project in any stage of development and we’ll workshop it with colleagues across the state.

**Thursday, July 29** at 2pm or **Friday, July 30** at 10am