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ABSTRACT

As the United States approaches the bicentennial of the Meriwether Lewis and William Clark expedition, it is critical to embark on a voyage of recovery to help restore the Missouri River to some of its original prominence and splendor. The mission of the Missouri River Project is to emphasize the role of the Missouri River in the physical development of the North American continent and to explore its impact upon the lives of Native Americans and subsequent settlers. The wide variety of materials and ideas presented in this teacher's manual are designed to help teachers integrate the Missouri River into their curricula, covering mathematics, science, history, and language arts. Activities reinforce skills in chronological thinking, historical comprehension, historical analysis and interpretation, historical research, and historical issues analysis and decision making. Following an introduction, the manual is divided into these grade-level sections: Grades 4-5 (five lessons); Grades 6-8 (three lessons); and Grades 9-12 (three lessons). Cites several primary sources and other resources. (BT)

The Missouri River Project: Save Our History. Teacher's Manual, Grades 4-12.

O'Connell, Libby Haight
Maxwell, Louise P.
Blake, Kevin

SAVE OUR HISTORY™

The Missouri River Project

BRINGING RIVERS TO LIFE

American Rivers
INDED 1975

TEACHER'S MANUAL

GRADES 4-12

SCIENCE • MATH • LANGUAGE ARTS • SOCIAL STUDIES

THE HISTORY CHANNEL.
WHERE THE PAST COMES ALIVE.

SAVE OUR HISTORY

The Missouri river project

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SAVE OUR HISTORY™

The Missouri River Project

Historians, environmentalists, and classroom teachers have worked together to create this teacher's manual on the history and preservation of the Missouri River, in proud partnership with American Rivers.

It is one part of **The History Channel's** *Save Our History*™ campaign, dedicated to historic preservation and history education.

Those of us involved in the creation of these materials have found that the subject provides unique opportunities for teachers to combine science, math, and language arts within the context of American history. We hope that you will find the manual a useful and enjoyable enrichment tool.

The researchers and writers at **The History Channel**, along with the staff at American Rivers, have worked hard to provide you with a rich variety of primary source materials, activities, portfolio projects, and text-based information suitable for grades 4 through 12. We have also produced on-line content for your students, to encourage independent internet research.

Don't forget to visit our web site for more information, or to order more copies of *Save Our History: The Missouri River* teacher's manual. You may also order a copy of our original documentary video, *Save Our History: The Missouri River—A Journey with Stephen Ambrose*, at the same web site. Visit us at **www.historychannel.com/classroom.**

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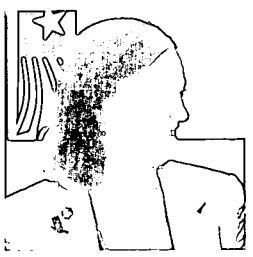

P.S. We love feedback. Please let us know how you are using this material and how your students respond. You can e-mail us at savehistory@aetn.com or fax us at 212-551-1540.

A river makes it real.

No matter what the subject, a river can make your lesson come alive. Rivers are a wonderful resource for teachers. Whether it's the mighty Missouri or your backyard stream, a single river can weave together countless topics and ideas, from history and ecology, to economics, politics, physics, and art—the possibilities are endless.

Students learn best when they can connect with the subject matter. And that's why rivers are such valuable teaching assets. People have a natural connection to moving water—both practically and spiritually speaking. Not only do rivers provide drinking water, trade routes, water for crops, and habitat for wildlife, they also are sources of recreation and renewal. An abstract subject can become immediately relevant to students of any age if it's presented in relation to a river.

Rivers are something we all have in common, because every community has one. But rivers are also what make us unique, because every river has its own history, is home to different plants and animals, and offers its own adventures.

Encourage your students to get to know their local river or backyard stream and volunteer with their local river group. Have your class write letters to elected officials, supporting river conservation. For more ideas on how to get involved, and for news about rivers, information, and experts, please visit (and bookmark) our web site, **www.americanrivers.org.**

As our board member, the late Charles Kuralt once observed, 'America is a great story and there is a river on every page of it.' I hope you will use rivers to tell your stories!

Sincerely,

Rebecca R. Wodder
President, American Rivers

CONTENTS

AMERICAN RIVERS

American Rivers, founded in 1973, is North America's leading river conservation organization. Its mission is to protect and restore America's rivers and to foster a river stewardship ethic. With over 25,000 members and supporters, American Rivers is striving to secure a future in which healthy rivers support an abundance of fish and wildlife, are safe for drinking and recreation, contribute to strong, sustainable economies, and improve the quality of life for all Americans.

For more information, contact American Rivers toll-free, 1-877-4RIVERS or E-mail: amrivers@amrivers.org

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introduction

the Missouri river project

Washington, DC, June 20, 1803

To Meriwether Lewis Esquire,
Captain of the first regiment of infantry of the United States of America.

The Object of your mission is to explore the Missouri river & such principal stream of it, as, by it's (sic) course and communication with the waters of the Pacific ocean, whether the Columbia, Oregan (sic), Colorado or any other river may offer the most direct & practicable water communication across this continent for the purposes of commerce...

*--Thomas Jefferson President of the United States of America**

With these instructions, United States President Thomas Jefferson initiated nearly two centuries of exploration along, and fascination with, the Missouri River. From the Plains Indians who made their homes on its banks to the European settlers who followed in the wake of explorers Meriwether Lewis and William Clark, inhabitants of the North American continent have looked to the Missouri as a conduit to the west.

In the nearly two hundred years since Lewis and Clark's historic journey, however, the encroachment of human civilization has so transformed the Missouri that today, we can only imagine what the river must have looked like to Lewis and Clark's "Corps of Discovery." As we approach the bicentennial of the Lewis and Clark exploration, it is critical that we embark on our own journey, a "Voyage of Recovery," as the nation's leading river conservation organization, American Rivers, has called it, to help restore the Missouri River to some of its original prominence and splendor.

The centrality of the Missouri River to our national heritage makes it a rich source for educational exploration. The mission of the Missouri River Project is to emphasize the important role of the Missouri River in the physical development of the North American continent and to explore its impact upon the lives of Native Americans and subsequent settlers.

The wide variety of materials and ideas presented in the following pages are designed to help teachers integrate the Missouri River into their curricula, from math and science to history and language arts. The Missouri River project may be used as a source for individual lesson plans or as a unifying theme for one grade level or an entire school. In particular, the activities and materials in the Missouri River Project support the objectives specified by the **National Standards for History**, as developed by the National Center for History in the Schools, Los Angeles, CA. Students engaged in the activities in this manual will strengthen their skills in *chronological thinking, historical comprehension, historical analysis and interpretation, historical research capabilities and historical issues analysis and decision-making.*

*Donald Jackson, *Letters of the Lewis and Clark Expedition* (Urbana: University of Illinois Press, 1978), 61-66.

grades 4-5

NATIONAL STANDARDS: The activities in this section explore the themes encompassed by Topic1, Standard 2 (history of local communities now and long ago); Topic 3, Standards 4 (evolution of democratic values), 5 (historical causes and consequences of migration), and 6 (cultural contributions to our national heritage); Topic 4, Standard 8 (scientific and technological discoveries).

I. SOCIAL STUDIES AND LANGUAGE ARTS: THE STORY OF THE CORPS OF DISCOVERY

Objective: Students will understand the qualities that made Meriwether Lewis and William Clark good candidates to lead, and Toussaint Charbonneau and Sacagawea valuable members of, the Corps of Discovery.
Time: 1 or 2 class periods
Skills: Reading and/or listening comprehension, research, and critical thinking
Content Area: History, Reading, and Language Arts

vocabulary

accurate – correct, free from error
awesome – causing or inspiring mixed feelings of dread and wonder
colonist – someone who settles a new territory
corps – a group of persons brought together for a common reason
curious – wanting to know or learn more
estimate – an educated guess about the size, extent or nature of something
expedition – a journey taken for a certain purpose
explore (exploration) – to travel over new territory for adventure or discovery; to study or investigate
extensive – having a wide range or covering a lot of territory
frontier – boundary that represents the outer limits of something, like knowledge or settlement
inauguration – the ceremony surrounding a leader's taking office
landscape – the landforms of a region or territory
property – a quality that identifies an object or person
Shoshone (sha-'shOn, or sha-shO-nE) – a group of American Indian peoples who originally lived throughout California, Idaho, Nevada, Utah, and Wyoming
valuable – worth a good price or of great use
vast – very great in size or degree, especially in extent or range

lesson

Long before he even became President of the United States, Thomas Jefferson had dreamed of exploring the western territory of the North American continent. Jefferson had many reasons for wanting to explore the west. For one thing, Jefferson had a very curious mind. He had spent a lot of time observing and writing about the plants, animals, and rivers in his home state of Virginia. He wanted to do the same thing for the western part of the continent, where few, if any American colonists had ever been. Jefferson also wanted to explore the west because he knew that the American population was getting larger all the time. People would need more land to farm and on which to build their homes. Finally, Jefferson wanted to find out more about the Missouri River. Rivers were very important to farmers and merchants who needed to get their goods to market. Jefferson, like many others, believed that the Missouri River might travel all the way across the continent from St. Louis. If that were true, the Missouri would complete something like a "water highway" from the Atlantic to the Pacific Ocean for farmers and others.

In February 1801, just before his **inauguration** as President, Jefferson asked a young man named Meriwether Lewis to be his secretary. Jefferson needed help organizing the army, and Lewis seemed like a good choice to him. Lewis, born August 8, 1774, had grown up near Jefferson's family outside of Charlottesville, Virginia. Lewis had served in the army as a paymaster for several regiments. This meant that Lewis had traveled throughout the west and had gotten to know many army officers there.

A year later, when Jefferson finally began planning the exploration of the west that he had been dreaming of for so long, he decided that Lewis would be the perfect person to lead that **expedition**. Jefferson knew that Lewis loved adventure and that he was as curious about the land and its plants and animals as Jefferson. Lewis's family had lived for a few years in the colony of Georgia when it was still a **frontier** settlement. From this experience, Lewis knew a little bit about what it was like to be an explorer. When Lewis had been in the army, he also had learned to master a boat on western rivers and had traveled widely by horseback. Lewis had gained **valuable** experience with keeping very good notes, because he had to keep **extensive** records for the army. Jefferson was looking for someone who could keep a very good journal to lead the expedition along the Missouri River.

For all these reasons, Jefferson decided that Lewis should serve as captain of the western expedition. Jefferson began teaching Lewis everything that he knew about plants, animals, and rivers. He also sent Lewis to study with the nation's most famous scientists and doctors. When he thought that Lewis had learned enough to begin the journey, Jefferson asked him to choose the rest of his team. Then, Jefferson sent him to Philadelphia to gather his supplies. In outlining his goals for the expedition, Jefferson asked Lewis to focus on two things: one, finding out if the Missouri River went all the way to the Pacific Ocean; and two, taking thorough notes about the landscape and all the plants and animals that he found on his trip. Exploring the western **landscape** was more important than ever to Jefferson because much of this land had just been made part of the United States. In 1803, Jefferson purchased the Louisiana Territory, almost doubling the size of the new nation.

Armed with instructions from Jefferson, Lewis set out to complete the rest of his team. Meriwether chose William Clark, with whom he had served briefly in the army, as his co-commander. The two leaders then set about selecting other men to accompany them, including a dozen or so enlisted men, a number of volunteers, and Clark's slave, York, to form their core group, named by Jefferson as the "**Corps** of Discovery." The Corps of Discovery started their expedition up the Missouri River in May 1804. They traveled slowly, carefully exploring and drawing maps of their surroundings as they went. They also kept daily journals for Jefferson, writing about things that they found along the way and the Indians whom they encountered. Lewis and Clark found all kinds of new plants and animals, some that served as food for the explorers, like buffalo, deer, and elk, and some that were simply awesome to see, like rattlesnakes, grizzly bears, and mountain lions. Often, they were making the first formal record of the landmarks that they spotted. As a result, it was up to Lewis and Clark to give them names. The explorers named many rivers on their expedition, often naming them for people they knew or for important political leaders. Sometimes, they named their discoveries based on physical **properties**, like naming the "Milk River" for its milky color.

As Lewis and Clark crossed the western territory, they depended heavily on many of the Indians whom they met to show them the way. One woman named Sacagawea (Sa-ka-ga-we-a),* born a **Shoshone** Indian, was especially important to the success of their mission. Sacagawea was the wife of a French-Canadian fur trader named Toussaint (Tü-san) Charbonneau (Shar-ba-nO), whom Lewis and Clark hired to join their expedition as a translator with Native Americans.

Lewis and Clark, with the help of their Indian guides, followed the Missouri River all the way to its source at the Continental Divide, only to discover that there was no short connection between the Missouri and the Columbia Rivers to the Pacific Ocean, as Jefferson and others had hoped. Instead, the Corps of Discovery learned that they would have to cross over the **vast** Bitterroot Mountain Range on foot to reach the Columbia River. Finally, in mid-November, 1805, the Corps caught sight of the Pacific Ocean. By Clark's **estimate**, which was remarkably **accurate**, the Corps had traveled 4,142 miles and 554 days from their starting point on the Missouri. After waiting out the winter at their newly constructed Fort Clatsop, the Corps began retracing their steps, arriving back in St. Louis on September 23, 1806.

**There has been a good deal of disagreement about the correct spelling and pronunciation of Sacagawea's name. For an overview of the positions, see www.lewisandclark. org/pages/sactext.htm.*

discussion questions

1. Why was exploration of the western reaches of the American continent so important to Thomas Jefferson, even before his purchase of the Louisiana Territory? (Think about the importance of rivers to answer this question.) And after the purchase?
2. What made the Lewis and Clark exploration so important to the history of the U.S.?
3. Do you think that the "Corps of Discovery" was a good name for Lewis and Clark's team of explorers? Does your school have any named teams? How did they get their names?
4. Describe the characteristics that made Meriwether Lewis a good choice to lead the Corps of Discovery along the Missouri River.
5. Why do you think that Jefferson considered journal-keeping so important to the Lewis and Clark expedition? What kinds of records do we keep today that help us understand other places? What else do we use today besides written journals and hand-drawn pictures to tell others about an unknown place?

6. How did Lewis and Clark name many of the discoveries they made? Can you think of places or objects in your own community that are named after people or that are named for the way that they look? If possible, try to trace the history of one of these objects—who is the person for whom the street, river, or plant is named, or what is the story behind the naming of the object?
7. Based on Clark's estimates of the length of the journey, how many miles did the corps travel each day, on average, on the first leg of their journey?

extended activities

As the above story explains, Jefferson had to choose the leader of the Missouri River expedition carefully. When people asked Jefferson why he chose Lewis instead of a scientist to lead the expedition, Jefferson said the following: "It was impossible to find a character who to a compleat science in botany, natural history, mineralogy & astronomy, joined the firmness of constitution & character, prudence, habits adapted to the woods, & a familiarity with the Indian manners & character, requisite for this undertaking. All the latter qualifications Capt. Lewis has." (Source: Donald Jackson, ed. *Letters of the Lewis and Clark Expedition, with Related Documents: 1783-1854*,Vol. I (Urbana: University of Illinois Press, 1978, 2nd ed.), 16-17.

When Lewis chose Clark and the rest of the men for the Corps of Discovery, he also had to make his decisions very carefully. Ask students to think about the kinds of qualities Lewis and Clark would have been looking for in the members of their team. Then, complete the following activity. (If you have internet access, you may log onto the home page of the Missouri River Project on **The History Channel** website, **www.historychannel.com**, to read the biographies of some of the Corps members.)

1. Have your students imagine planning their own expedition or trip to some new part of the country. Ask your students to write a short biographical description of the kind of person that they would like to have with them on such a voyage. Then have students share these descriptions with the class and identify which qualities iappeared most frequently in students' descriptions and which qualities were mentioned less frequently. Discuss with your students whether or not their chosen members would work well as a team. Would each of the members balance the others out? Why or why not?

II. SOCIAL STUDIES AND LANGUAGE ARTS: THE LURE OF THE WEST

Objective: Students will use first-hand accounts to evaluate life on the frontier and to distinguish reality from fantasy.
Time: 1-2 class periods
Skills: Reading and/or listening comprehension, and creative writing
Content: History and Language Arts

vocabulary

anticipate – to give advance thought to; to foresee
Mormon – a religious group founded in the early 1800s by Joseph Smith and whose religious beliefs are contained in the Book of Mormon
similar – alike; sharing certain qualities
ultimate – the best or most extreme of its kind

lesson

Read the following passage with your students, helping them to understand the haphazard spelling used by Mary Haskin Parker Richards. Explain to students that there were few "spelling rules" in the early 1800s. The first formal spelling book was not published until 1783, and few people followed its guidelines. Imagine how difficult this must have made it for people to understand what others were writing about!

Many young, unmarried men signed up to accompany the Lewis and Clark expedition because they knew that they would receive a land grant when the journey was completed. Many, however, simply saw the trip as the **ultimate** adventure. The men found it thrilling that they would be exploring territory that no American settler had ever seen. Following the Missouri River with Lewis and Clark was a once-in-a-lifetime opportunity. Once on the journey, however, things were often difficult and even dangerous. Just after the Corps of Discovery crossed the Continental Divide, the group ran into serious trouble. They nearly ran out of food and even had to kill

two of their sick horses so that the men wouldn't starve. Sometimes it snowed or rained so hard that the men could not even move forward. At one point, Clark wrote that he had never been so wet and cold in his whole life.

When other young men and women traveled westward in the footsteps of Lewis and Clark in later years, they experienced **similar** difficulties. Many moved west in hopes of finding cheap land, and though usually not disappointed, often had not fully **anticipated** the hardships of frontier life. One woman named Mary Haskin Parker Richards who left England in the 1840s to join her parents in America, wrote a detailed description of her life among the **Mormons** in a settlement along the Missouri River. While generally positive about her settlement in the Mormon's Winter Quarters near Council Bluffs, Iowa, Mary also wrote openly about the hardships of frontier life. In one letter to her husband, Mary wrote the following: "we have traviled about 8 miles today. The roads exceeding muddy. very hard traviling. the weather cold. wore my shawl & cloak. all day. and have never felt worm til now. we can see nothing but Praira for several miles. we had a tremendious storm last Sun eve. & allso on Tus night. beat through our covers & wet our bed clothes..." Mary's journals, like those of other women living on the frontier, describe endless rounds of washing, sewing, ironing, cooking, cleaning, and other household chores. Women and men on the frontier, especially those who were not living in formal settlements like those constructed by the Mormons, often found life lonely. Despite these hardships, Mary, like many other frontier settlers, focused on the beauty of the west and on the exciting possibilities for the future.

Maurine Carr Ward, ed. *Winter Quarters: The 1846-1848 Life Writings of Mary Haskin Parker Richards* (Logan, UT: Utah State University Press, 1996), 72-73.

discussion questions

1. Why do you think that people were attracted to the west? What did they hope to find there?
2. In what ways did life on the frontier differ from what people expected to find there?
3. When you are going to some new place, how do you get information about it? What made it so difficult for early American settlers to find out about the west?
4. Did men and women face the same hardships on the frontier? Why or why not? In what ways were their experiences the same? How were they different?

extended activities

1. Have your students write a promotional piece or create a collage from newspaper and magazine clippings, trying to convince settlers to join a western expedition. Then discuss in class what kinds of things might attract people to an expedition and why.
2. Ask students to write a letter to a family member trying to convince them to join or not to join a western expedition. Read the letters aloud in class and discuss why the students took the positions that they did.

III. USING MATH TO PLAN AN EXPEDITION: CALCULATING PROVISIONS

Objective: Students will use mathematical skills to estimate quantities and to plan for travel.
Time: 1-2 class periods
Skills: Multiplication and division and critical thinking
Content: Basic Math

lesson

1. Discuss how Lewis might have gone about deciding what to bring on the expedition and how much of each item he needed. Ask students to think about the factors that he had to consider in making these decisions. Remind students that there were about 25 to 30 permanent members of the Corps, but that Lewis was not sure how big the party would be when he first made his purchases in Philadelphia. In addition, because there was so much unknown about the western territory, it was very difficult to plan for the expedition. Lewis ran short of only a few non-essential items, like tobacco and beads, and still had plenty of guns, powder and ink when he returned. Does this demonstrate good planning on Lewis's part? Why or why not? Why do you think that Lewis may have purchased more of certain items, like ink and weapons?

2. Ask your students to imagine a camping trip that they might take with their friends or family members. What kinds of provisions would they need to pack? How would they decide how much to bring? Have students utilize their multiplication skills to determine how much of each item they should bring. For which items should they overestimate? underestimate? Lewis spent a total of $2,324 on the items he purchased for the trip. How much do you think that it would cost to fill your list? (As an extension of this activity, you may ask students to estimate the weight of each of the items that they are bringing and try factoring this into their calculations. (Remind students that weight was a big factor for the Lewis and Clark expedition, since members of the Corps of Discovery either had to carry their own provisions or make room for them in their boats!) Does this change the composition of the students' original packing lists?

IV. NATURAL SCIENCE ON THE LEWIS AND CLARK EXPEDITION: IDENTIFYING PLANTS AND ANIMALS

Objective: Students will learn the basic principles of scientific observation.
Time: 1-2 class periods
Skills: Reading comprehension, creative writing, and scientific observation
Content: Basic Math and Language Arts

lesson

Read the following description of a bird, first sighted by Clark in 1805, and then observed more carefully by Lewis some nine months later. You may need to help your class understand some of the language and the unusual spelling used by Lewis. As a class, answer the corresponding questions.

Lewis wrote the following description in his journal on May 28, 1806:

The bird *"has a loud squawling note something like the mewing of a cat. the beak of this bird is 1-1/2 inches long...large, [and] black...the upper exceeds the under chap [beak] a little. the head and neck are also proportinably large. the eye full and reather prominent, the iris dark brown and puple black. it is about the size and somewhat the form of the Jaybird tho reather rounder or more full in the body. the tail is four and a half inches in length, composed of 12 feathers nearly the same length. the head neck and body of this bird are of a dove colour. the wings are black exccept the extremities of six large fl[e]athers occupying the middle joint of the wing which are white. the under disk of the wing is not of the shining or gr[l]ossy black which marks its upper surface. the two feathers in the center of the tail are black as are the two adjacent feathers for half their width the ballance are of a pure white. the feet and legs are black and imbricated with wide scales. the nails are black and remarkably long and sharp, also much curved. it has four toes on each foot of which one is in the rear and three in front. the toes are long particularly that in the rear. This bird feeds on the seed of the pine and also on insects. it resides in the rocky mountains at all seasons of the year, and in many parts is the only bird to be found."*

Reprinted from *The Journals of the Lewis and Clark Expedition*, volume 7, edited by Gary E. Moulton by permission of the University of Nebraska Press, © 1991).

discussion questions

1. What kinds of qualities did Lewis have to highlight in order for others after him to be able to identify the same specimen?
2. Do you think that you would be able to recognize this bird if you had seen it for the first time after reading this description? Why or why not? What else would have helped you? Have students try drawing a picture of the bird from the above description. Then, if possible, have them look up a picture of this bird, now known as Clark's Nutcracker, either in a field guide, such as Peterson's *Field Guide to North American Birds*, or on the following website: **www.mbr-pwrc.usgs. gov/bbs/anim/h4910.html**.
3. In many cases, Lewis and Clark had to collect the specimens that they were observing. For plants, this was easy, but for birds and other animals, this often meant that Lewis and Clark had to kill whatever it was that they were describing. Do you think that it was alright for them to do this, given the importance of the scientific discoveries that they were making?

extended activities

1. Pick some plant, animal or bird native to the area in which you live and try to write a detailed enough description that others in your class would be able to identify it. Try not to choose something too obvious. Share the descriptions in class and see how successful students were in describing their choices.
2. If you have internet access, refer to the American Rivers website, **www.amrivers.org**, for a list of plants and animals identified by Lewis and Clark that had been unknown to science prior to their expedition. Distribute the list to the class or display it on an overhead projector. Ask students to choose an animal or bird on this list. They may choose something that still exists in abundance or something that is endangered or extinct. (The American Rivers website also contains a list of these species that have become endangered or extinct. Two such bird species that students may enjoy learning about are the Piping Plover and the Least Tern.) Have students do some research on the animal or bird, describing where it lives and what it eats. If the species is endangered, ask students to explain why. If, for instance, the animal has lost its habitat or its food source, have students describe how or why.

V. SCIENCE AND ECOLOGY: THE MISSOURI RIVER TODAY

Objective: To familiarize students with the concept of an ecosystem and to help them understand the importance of water to the maintenance of diversity.
Time: 2-3 class periods
Skills: Research, interviewing, identifying plants and animals
Content: Environmental History and Science

vocabulary

alteration – a change or modification
cargo – goods carried in a ship, vehicle, or airplane
channel – the bed where a natural stream of water flows
endangerment – in a state of danger or peril
floodplain – level land that may be covered in flood waters
habitat – the place where a plant or animal naturally lives and grows
irregular – not regular; variable
levee – a raised structure that prevents flooding
navigable – deep and wide enough to allow ships to pass through
species – a class of individuals having common physical traits and sharing a common name

lesson

Beginning with Jefferson's dream of finding an all-water route to the Pacific via the Missouri River, Americans have spent a great deal of time and effort trying to speed transportation along the river. As a result of human efforts to tame the river and make it more **navigable**, the Missouri has changed a great deal since the days of the Lewis and Clark expedition. The Missouri River encountered by the Corps of Discovery was changing constantly. The water ran through several main channels but also through thousands of smaller side channels. The irregular water flow created lots of sandbars and other natural places where birds and fish could live. This was good for wildlife, but it made it harder for farmers and merchants to ship their goods on the river. So Americans began constructing dams and building levees along the banks of the Missouri in an effort to stop the flooding and to control the flow of the water. In the 1940s, the United States government approved construction of a deep-water **channel** from St. Louis to Sioux City to make it easier for barges to carry **cargo** along the river. Many hoped that this channel would help the river become competitive with railroads in the shipment of goods.

All of these changes may have made it easier for barges to get up and down the river, but they have destroyed the **habitat** of many birds, fish, and animals. Birds, insects, plants and fish that used to depend on the shallow waters of the Missouri for food and shelter now have few safe places to go. Many of these **species** that used to live along the Missouri have been placed on federal and state watch lists for **endangerment**. The **alteration** of the river has affected people, too. Channelization has practically ruined fishing on that segment of the river and has made boating and other forms of recreation too dangerous. In addition, when the Missouri floods today, the losses

experienced by many people are even greater, because many people have built their homes and farms in what used to be the Missouri **floodplain**. For all of these reasons, it is very important that we try to restore the Missouri River, as best we can, to a natural state that can support wildlife, recreation and tourism.

activities

1. Show students a picture of a pond community, either in a science book or from some other text. (If you have internet access, you may have students log onto the "Kids Page" of the American Rivers website: **www.amrivers.org/kids-rivers.html.** This website has a great description of a river ecosystem, a fun list of "Facts on Rivers and Critters," and other engaging activities, like having students make magnifying glasses to look at objects underwater and having them build their own rivers. Daniel Botkin's *Passage of Discovery* has a number of good illustrations, including pictures of floodplain vegetation and its importance to river life. See list of additional resources at the back of the manual for information on purchasing this book.)
    a. Ask students to label and color all nonliving things in the picture. Point out that soil, which contains dead leaves and sticks called humus, is necessary for plants to grow. Describe the role that plants, primary producers of food, play in an ecosystem. Plants that grow above the ground get energy from the sun, remove carbon dioxide from the air, and then release oxygen.
    b. Explain to students what scavengers are—small animals, like worms and bugs, that feed on dead plants and animals in the soil, breaking them down into smaller parts. Ask students to color and label the scavengers they find in the picture.
    c. Describe the function of decomposers—tiny bacteria and fungi that break down these smaller parts into minerals necessary for plant growth. Ask students to color and label the decomposers.
    d. Next have students label all the animals that feed on primary producers, like plants and grasses. These animals are called primary consumers. Secondary consumers feed on other animals. Explain to students that whether an animal is a primary or secondary consumer depends completely on what they eat, not on their size. (One hint to students in deciding if certain birds and animals are primary or secondary consumers is to look at the beaks and claws.)

Once students have completed this exercise, answer the following questions:

1. Why do you think that plants and animals live together and are dependent on each other? What factors could disrupt this interdependency? What, for example, would happen if, all of the sudden, all the plants that a certain animal or bird depends upon disappeared?
2. What is the role that rivers play in maintaining a balanced ecosystem? What kinds of changes to a river might disrupt this balance? Ask students to identify, based on the above reading, what changes have occurred in the Missouri that may have had a harmful impact.
3. How do people fit into the ecosystem that the students have illustrated above?

extended activities

1. Discuss with students the concept of a food chain and have them create a flow chart illustrating the relationships between the items that they have just colored on the above picture.
2. Have students interview some adults who have lived in your community for a long period of time about the changes that they have seen in the physical landscape around them. Have certain kinds of habitat, forests, grasslands, or marshes appeared or disappeared? Have there been any changes in the water sources in the community? What role have humans played in these changes? Students should identify the reasons for these changes. Discuss with students the importance of compromise in situations where environmental concerns exist.

grades 6-8

NATIONAL STANDARDS: This section meets the following National Standards for grades 5-12: 1 (Chronological Thinking), 2 (Historical Comprehension), 3 (Historical Analysis and Interpretation), 4 (Historical Research Capabilities), and 5 (Historical Issues—Analysis and Decision Making) for Eras 4 (1801-1861), 9 (1945-early 1970s), and 10 (1968-Present).

I. MAPPING THE AMERICAN FRONTIER: THE LOUISIANA PURCHASE AND LEWIS AND CLARK

Objective: Students will understand the concept of a frontier and will be able to identify and explain the reasons for western expansion.
Time: 1-3 class periods
Skills: Reading comprehension, research, map-reading and map-making
Content: History, Geography, Math and Art

"Let the Land rejoice, for you have bought Louisiana for a Song."

--Gen. Horatio Gates to President Thomas Jefferson, July 18, 1803

vocabulary

cartographic – having to do with maps and map-making
celestial – relating to the sky or the heavens
chronometer – an instrument used to measure time
Mandan – a group of American Indians from the Missouri River Valley region
octant – an instrument used in navigation to measure the altitude of a celestial body
quadrant – a tool used to measure altitudes
sextant – a tool used in navigation to measure longitude and latitude
subsist – to have the means for staying alive

lesson

The story of the Lewis and Clark expedition is a great opportunity to explore the history, meaning, and uses of maps over time. When Lewis and Clark set off on their journey out west, they had little idea of what to expect. The written and **cartographic** records of the territory west of the thirteen colonies were sketchy, at best. This was especially true for everything west of the Mississippi River. Lewis and Clark knew that once they left the **Mandan** villages, near present day Bismark, North Dakota, they would be travelling through territory that no American settler had ever seen. To give you some idea of how difficult their task was, consider that the astronauts who landed on the moon had better maps of the moon's surface than Lewis and Clark had for the American west![1]

Many Americans were curious about what lay west of the Mississippi River, and none more so than President Thomas Jefferson, who dreamed of creating a nation of small, independent farmers **subsisting** off the land. Jefferson, like many others, also dreamed of finding an all-water route to the Pacific Ocean that would allow merchants and farmers to ship their goods from one side of the country to the other. After the Louisiana Purchase in 1803, it became even more important that Americans have some kind of formal survey of this territory. That year, the United States bought the Louisiana Territory—828,000 square miles of land west of the Mississippi River—for $15 million from France. The new lands stretched from the Mississippi River to the Rocky Mountains and all the way from the Gulf of Mexico to the Canadian border. The Louisiana Purchase, which provided land for 13 new states, nearly doubled the country's size. While providing settlers with new land, the Louisiana Purchase also secured Americans' access to the Mississippi River and the port of New Orleans—an important consequence since so much of the country's trade depended upon river travel. *(If your class has internet access, you may want to direct students to the following site for a map illustrating the impact of the Louisiana Purchase:* **www.lib.utexas.edu/Libs/PCL/Map_collection/united_states/US_Terr_1810.jpg**
For a copy of the purchase, see **www.nara.gov/exhall/originals/loupurch.html**)

For these reasons, Jefferson considered map-making one of Lewis and Clark's most important tasks. Jefferson sent Lewis to the Pennsylvania home of Andrew Ellicott, the country's leading astronomer and mathematician, to learn how to make **celestial** observations that would aid him in mapping the Corps of Discovery's positions, as they moved westward. Lewis learned to use the **sextant** and the **chronometer,** two instruments crucial to making accurate maps. On the expedition, Lewis also brought with him a compass, an artificial horizon, a **quadrant** (also known as an **octant**), and a set of plotting instruments.

1 "Fact on Astronauts" from Daniel B. Botkin, *Passage of Discovery: The American Rivers Guide to the Missouri River of Lewis and Clark* (New York: Berkley Publishing Group, 1999), 16. (See list of additonal resources at the back of this manual for information on purchasing this book.)

The primary responsibility of map-making fell to Clark, who did a remarkable job. Clark's estimate of how far the Corps of Discovery traveled from St. Louis to the headwaters of the Missouri River, 4,142 miles, was off by less than 50 miles. After his return to St. Louis, Clark continued to improve his map, adding information provided by explorers who traveled along the Missouri in the footsteps of the Corps of Discovery. Clark's map was a triumph and a significant contri-bution to the country's knowledge of its western territory. First published in 1810, the map illustrated for the first time that there was no direct connection between the Missouri and Columbia Rivers, as many had hoped, and that the western mountains were not part of a single range.

discussion questions

1. Why do you think that mapping the Missouri River was so important to Jefferson? Why would it have been important to farmers? To fur traders? To merchants?
2. How much did the United States pay per acre for the Louisiana territory? Do you think that Jefferson got a good deal? Looking at the map on the previous page and a current U.S. map, determine which 13 states were eventually carved out of the Louisiana Territory. (As an extended activity, students can look at local newspapers to research the price of real estate in their own neighborhoods or community, in order to get some idea of current land values. Explain that land values may vary according to location. How does scarcity affect these values?)
3. Talk to your students about the concept of a frontier. Why would some American settlers have been attracted to the idea of crossing this boundary? As an extended activity, you may ask students to think about what kinds of frontiers exist for us today. You also may wish to have your students write a persuasive piece arguing either for or against crossing the frontier that they have identified and then discuss in class their reasons for choosing this position.
4. Do you know what a compass is and how it is used? A sextant? A quadrant? If not, look up these navigational tools in a dictionary or an encyclopedia. If you have access to the internet, you may visit the following websites for more detailed discussions of the instruments and for pictures of some of these tools: **www.kcmuseum.com/rivers.html;** follow the link to Surveying & Mapmaking **www.lib.virginia.edu/ exhibits/lewis_clark/ch5.html**
5. How has our ability to measure distances on rivers improved today? What tools do we use to measure location?

extended activities

1. Have students look at the map collections on the following websites. The first site listed, a selection of maps that would have been available to Lewis and Clark prior to their expedition, allows students to see the advances in mapmaking and geographical knowledge over time. The third map shows the progress of western exploration over the first quarter of the 19th century. Ask students if they consider this to have been a rapid rate of exploration. Why or why not? What factors determined how quickly the west was explored? And mapped?
   www.lib.virginia.edu/ exhibits/lewis_clark/ch4.html
   www.earlyamerica.com/earlyamerica/maps/ northamerica/na-map.jpg
   www.lib.utexas.edu/Libs/PCL/Map_collection/ united_states/Exploration_1800.jpg
2. To demonstrate the complexity of map-making, ask students to try making a map of their own. Students might try drawing a map of their route to school. Students should include major landmarks that they pass along the way, as well as natural variations in the terrain, like streams, creeks, and large areas of trees. (Remind them how much harder this would be if they had never been to the place that they were mapping!) After students have finished the exercise, ask them to consider whether or not a friend would be able to understand the relative distances between places on the map. You might discuss the possibility of including a scale and/or a legend on the map to help others read it. If you introduce the idea of scale, you may want to have students measure the distances and then try to calculate the length of time that it takes each student to arrive at school, depending upon their mode of transportation. Explain how much more difficult it would have been for Clark to measure distances, since the Corps of Discovery changed its mode of transportation so often, from foot, to horse,

to boat. In addition, the river itself was constantly changing. The river's length and rate of flow changes from season to season, depending upon rainfall.

3. Have students choose one of the Native American tribes encountered by the Corps of Discovery and research how it was affected by the tide of westward expansion instigated by the Lewis and Clark expedition. What did they lose besides land? How did the Indians your students have researched react to the westward movement of European settlers? Did different groups respond differently? Have students speculate about the reasons for this.
4. Have students research the history of the Louisiana Purchase. See if they can discover why it was a controversial decision at the time (hint: Pay special attention to the political views of Federalists and Anti-Federalists.) After doing this research, ask students if they agree with Jefferson's decision to purchase the Louisiana Territory, even though it was a huge usurpation of power by federal authorities. How did this acquisition affect different groups of people living in North America?

II. THE ART OF JOURNAL WRITING: THE LEWIS AND CLARK EXPEDITION AND RIVER EXPLORATION

Objective: To illustrate to students the types of language that make a description effective and to teach them to write their own passages using illustrative and colorful language.
Time: 1-2 class periods
Skills: Reading comprehension and creative writing
Content: History and Language Arts

vocabulary

abruptly – occurring without warning or preparation
brawling – quarreling or fighting noisily
capital – the top or head of a classic column
embedded (written by Lewis as imbedded) – to enclose closely or make a part of
levee – a raised structure that prevents flooding
oblique – not straightforward, obscure or indirect
pedestal – the support or foot of a classic column
perpendicular – standing at right angles; directly upright
perpetual – continuing forever; everlasting
prostrate – lying stretched out with face on the ground, often in submission
tawny – a warm, sandy color

lesson

Over the years, many different writers have penned evocative descriptions of the Missouri River. Have students read the following descriptions of the Missouri River and answer the corresponding questions.

Meriwether Lewis wrote the following description of the surrounding terrain as the Corps of Discovery approached the White Cliffs of the Missouri on May 31, 1805:

"The hills and river cliffs which we passed today exhibit a most romantic appearance. The bluffs of the river rise to the height of from two to three hundred feet, and in most places **perpendicular**. They are formed of remarkable white sandstone which is sufficiently soft to give way readily to the impression of water. Two or three thin horizontal strata of white freestone, on which the rains or water make no impression, lie **imbedded** in these cliffs of soft stone, near the upper part of them. The earth on the top of these cliffs is a dark rich loam which, forming a gradually ascending plain, extends back from 1/2 a mile to a mile, where the hills commence and rise **abruptly** to a height of about 300 feet more. The water, in the course of time, in descending from those hills and plains, on either side of the river, has trickled down the soft sand cliffs and worn it into a thousand grotesque figures which, with the help of a little imagination, and an **oblique** view, at a distance are made to represent elegant ranges of lofty free- stone buildings, having their parapets well stocked with statuary. Columns of various sculpture, both grooved and plain, are also seen supporting long galleries in front of those buildings. In other places, on a much nearer approach and with the help of less imagination, we see the remains or ruins of elegant buildings: some columns standing and almost entire, with their **pedestals** and **capitals**; others retaining their pedestals but deprived by time or accident of their capitals; some lying prostrate and broken; others in the form of vast pyramids of conic structure bearing a series of other pyramids on their tops, becoming less as they

ascend and finally terminating in a sharp point. Niches and alcoves of various forms and sizes are seen at different heights as we pass." (from website: **http://xroads.virginia.edu/~hyper/journals/journals.html**)

Writing about the river in 1907, more than a century after the Lewis and Clark expedition, George Fitch described the Missouri River as the "hungriest river ever created...eating all the time—eating yellow clay banks and cornfields, eighty acres at a mouthful, winding up its banquet with a truck garden and picking its teeth with the timbers of a big red barn...Its yearly menu is ten thousand acres of good, rich farming land, several miles of railroad, a few hundred houses, a forest or two and uncounted miles of sandbars...he Missouri is a **tawny**, restless, **brawling** flood. It cuts corners, runs round at night, fills itself with snags and traveling sandbars, lunches on levees, and swallows islands and small villages for desert. Its **perpetual** dissatisfaction with its bed is the greatest peculiarity of the Missouri...it makes farming as fascinating as gambling. You never know whether you are going to harvest corn or catfish."

George Fitch, "The Missouri River, Its Habits, Eccentricities Described by a Personal Friend," *The American Magazine* LXIII:6 (April 1907): 637-38.

discussion questions

1. Ask students in your class to describe, in their own words, the scene that they can imagine from the above descriptions. What natural features jump out in each of the descriptions? You might have students try deleting all the adjectives from the descriptions and read them again. What does this tell them about the importance of words?
2. In what ways does Lewis's description differ in character from that of Fitch? Think about the audience for each description and how this may have affected the writing style in each case.
3. What kinds of words does each author use to bring the image to life? Discuss with your class the concept of metaphor and ask them to evaluate Fitch's success with this approach. What was he trying to convey? Is he successful?
4. Why were written descriptions of the river so important when these men, especially Lewis, were writing? What makes their journals effective, even today, as guides to the paths they travelled? How else can we convey images today? Do you think that this has changed the way we write? Why?
5. Do students know of any rivers that look like the one being described above? If your class is located on or near the Missouri, have students discuss the ways in which the river today differs from the descriptions of Lewis and Fitch.

extended activities

1. Have students read in class or as homework other journal entries by Meriwether Lewis and select one passage that they find most compelling. [Listed below are some suggestions from a website containing selected entries from the Lewis and Clark journals, but students may choose from any found there or in a collection such as *The Journals of the Lewis and Clark Expedition*, Gary Moulton, ed. (Lincoln: University of Nebraska Press, c1983)]. Ask students to try drawing a picture of what they imagine that Lewis or Clark was looking at when he wrote the entry.
   Website: http://xroads.virginia.edu/~hyper/journals/journals.html
   Suggested selections:
   June 13, 1805—"Gathering Information"
   August 23, 1805—"Across the Rocky Mountains"
   November 10, 1805—"And Gazed at the Pacific"
2. Ask students to select some natural place that they know well or have visited and write a journal entry describing it. If your school is located near a river, students could take a field trip to the river and pick a particular spot to write about. Remind students to think about the kinds of features that readers would need to know about in order to picture the place that is being described. Remember to pay close attention to the language and the words being used. If possible, have students exchange their descriptions (with or without their names on them) and then try to draw the place from the description that they are given. At the end of the exercise, you may choose to "publish" the collection of descriptions and illustrations in your own class journal.

III. MATH AND SCIENCE: CALCULATING THE RATE OF CHANGE ALONG THE MISSOURI RIVER

Objective: Students will see tangible evidence of the ecological changes to the Missouri.
Time: 1-2 class periods
Skill: Multiplication and division, and scientific experimentation
Content: Math, Environmental Science and History

lesson

Shortly after Lewis and Clark completed their western expedition, people began removing obstacles (commonly called snags) from the Missouri River, in order to make it easier for boats to travel along the river. In addition to authorizing the removal of snags and debris, the U.S. Army Corps of Engineers came up with a plan in the 1940s to further aid barge traffic along the Missouri. Known as the Pick-Sloan Plan, the Corps of Engineers's scheme called for 5 of the world's largest earthen dams in Montana and the Dakotas, to add to Fort Peck Dam, built in Montana in the 1930s, and a 732-mile navigation canal between Sioux City, Iowa and St. Louis, Missouri. All of these changes to the river have produced a number of unforeseen results.

Flooding has continued at a rate far above the levels predicted by engineers. At St. Charles, Illinois, the river level now is higher than it was before the construction of levees. When the flow of the river reaches 200,000 cubic feet per second, the river is 5 feet higher than it used to be, and at 500,000 cubic feet per second, it is 7 feet higher.

Revenue production on the Missouri also has not followed the patterns predicted by engineers. Engineers originally had expected barges to carry up to 20 million tons of cargo a year, but the most that the Missouri ever carried was 3.3 million tons in 1977. In the mid-1990s, that number had dropped to 1.5 million tons, with barges producing just $7 million dollars in revenue. This $7 million dollars represents only a small part of the total economic benefits produced by the Missouri, making commercial traffic a far less important source of revenue than predicted.

Recreation, on the other hand, has become a much bigger business than engineers ever expected. Whereas engineers who created the deep-water channel insisted that the transportation of cargo would become a major source of revenue along the Missouri, it is the non-channelized section of the river that is proving to be more lucrative. Today, on the 59-mile stretch of non-channelized water between Gavins Point Dam and Sioux City, people spend approximately $4.9 million dollars a year on recreation. In contrast, spending on recreation on the much longer 732-mile channelized river between Sioux City and St. Louis produces about $14.2 million dollars a year. One can only imagine how much revenue might be made by recreational activities if the channelized river could be restored to its natural state.

The number of people who visit the Missouri every year is proving just how vital recreation is to the economic survival of the river. More than 4 million people spend more than 10 million "visitor days" at different places along the Missouri, including approximately 3 million annual visits to more than 70 recreational facilities between Sioux City and St. Louis. River tourism continues to grow all along the river, with each of the states bordering the Missouri reporting increasing revenues every year.

Note: For more information and for pictures on the building of Fort Peck Dam, see www.midrivers.com/~rafter/lake.

discussion questions

1. How much revenue per mile is generated on each of the two sections (channelized vs. non-channelized) of the river. How much more lucrative is one portion of the river than the other?
2. How much less tonnage is carried along the Missouri in the 1990s than was originally forecast? What percentage drop is this? What about in 1977, compared to the original forecast? And 1977 compared to the 1990s?
3. Recreation and shipping represent only a small portion of the total revenue generated along the river. If the total revenue in the mid-1990s was approximately $700 million, what percentage of this does the $19.1 million ($4.9 plus $14.2)

produced by recreational activities represent? What percentage of the total 1990s revenue was produced by shipping? Based on the shipping figure of 1.5 million tons, how much revenue was being generated for each ton of cargo shipped on the Missouri in the mid-1990s?

4. Assuming that each of the 70 recreational facilities along the Missouri receives approximately the same number of visits, how many visits does each facility get annually?
5. If about 4 million people spend about 10 million "visitor days" on the Missouri each year, how many days does the average person spend? Why can we take this number only as an average?
6. Assuming that spending on recreation, per mile, on the presently channelized section of the river would equal that spent on the nonchannelized portion, if the former were restored to its natural state, how much additional revenue would be made?

extended activities

1. Pick some aspect of river life that you would like to "publicize," like the need for wildlife conservation, for moving existing levees back to give the Missouri more room to spread out during floods, for the promotion of river-related recreation, or simply for appreciating the river's beauty, and create a collage. (If you live in a community where some river-related environmental issue is in the news, you may wish to have students focus on this issue.) A collage is a collection of photos and other materials, arranged in a way that conveys some message to the viewer. (Students will need a collection of old magazines, markers, scissors, glue, and a piece of poster board.) Present the collages to the class, having students discuss the issues that they have chosen and describing why they have chosen the images that they have to promote their causes. Have students evaluate the collages that they find most effective, discussing the tactics that are most persuasive. Was the message clear? Which elements of the collage were especially effective in conveying the message?
2. If you have internet access, log onto the American Rivers website, **www.amrivers.org/missouriwildlife.html**, to see a list of species found along the Missouri River that are now considered at risk. Ask students to choose one of the species listed here and do further research about the reasons for the species' decline. OR As a class, focus on the pallid sturgeon, a species that emerged 150 million years ago and that over the last 50 years has nearly disappeared. The following are several websites with which your class might start its research:
www.usbr.gov/platte/backgr/sturg.htm
www.aux.msc.nbs.gov/MICRA/PALLIDST.HTM
www.ngpc.state.ne.us/infoeduc/mag/march/sturgeon.html

For an additional science experiment, you can log onto The History Channel website, HistoryChannel.com, for a lesson about the human impact on the Missouri River. You may also refer to Experiment V, in Grades 4-5 section of the manual.

grades 9-12

NATIONAL STANDARDS: This section meets National Standards 1 (Chronological Thinking), 2 (Historical Comprehension), 3 (Historical Analysis and Interpretation), 4 (Historical Research Capabilities), and 5 (Historical Issues—Analysis and Decision Making) for Eras 4 (1801-1861), 9 (1945-early 1970s), and 10 (1968-Present), grades 5-12.

I. WESTWARD EXPANSION AND NATIVE AMERICANS

Objective: To help students "investigate the impact of trans-Mississippi expansion on Native Americans," per Standard 1B, Era 4, National Standards for History.
Time: 1-3 class periods
Skills: Reading comprehension, critical thinking, and creative writing
Content: History and Language Arts

vocabulary

cultural superiority – the belief that one's own culture is superior to or more advanced than another
entitlement – the right to something or some benefit, especially by law or contract
escalate – to increase in amount or intensity
ethnocentric – characterized by or based on the attitude that one's own group is superior
habituated – used or accustomed to
perspective – point of view; the ability to view things in their true relations or relative importance
placate – to soothe or try to comfort
prevalence – the degree to which something is widely accepted or practiced
Sioux – (Sü) a group American Indians speaking the Siouan language
susceptible – open or responsive to some influence or agency

lesson

When Thomas Jefferson and other European settlers dreamed of westward expansion, they did so from a very limited **perspective.** They showed little concern for the impact that European settlement might have on Native Americans already inhabiting these lands. In fact, Jefferson, like many others, took an **ethnocentric** view that European settlement in the west would have a positive impact on Native Americans. During his first annual message in 1801, Jefferson, for example, insisted that the United States looked forward to "rapid growth and the prospect it holds up to us, not with a view to the injuries it may enable us to do to others in some future day, but to the settlement of the extensive country still remaining vacant within our limits, to the multiplications of men **susceptible** of happiness, educated in the love of order, **habituated** to self-government, and valuing its blessings above all price."* Jefferson, in other words, was convinced that Native Americans, whom most Europeans assumed to be **culturally inferior**, would benefit from what he believed to be the civilizing influence of European settlers. Jefferson assumed that Native Americans would learn valuable lessons about "order" and "self-government."

This belief shaped European settlers' view of the United States's successful purchase of the Louisiana Territory in 1803. Most believed that Native Americans living in the acquired areas would benefit from their inclusion in the U.S. The **prevalence** of this attitude certainly shaped the Corps of Discovery's encounters with Native Americans during their western expedition. After the United States's purchase of the Louisiana territory, many Native Americans living in the west technically were residing on U.S. soil. This change in legal status transformed the explorers' negotiating position. Lewis and Clark, whether motivated by a sense of **entitlement** as representatives of the U.S. government or by a sense of **cultural superiority**, approached Native Americans in the west as if the Corps of Discovery's right to their lands was a foregone conclusion.

As you can imagine, the Corps of Discovery's outlook often put them at odds with Native Americans and led to all kinds of misunderstandings and conflicts. One such misunderstanding arose on September 24, 1804, when Lewis and Clark were meeting with a group of **Sioux** chiefs. Three chiefs and a group of warriors who had come aboard the Corps's ship for a council became angry when they realized how few gifts the Corps intended to give them. Unable to communicate Jefferson's stance on Indian matters, due to the inadequacy of his interpreter, Lewis hoped to **placate** the Sioux by ordering Corps members to perform their traveling medicine show and by handing out a few trinkets. When the chiefs voiced their displeasure at this turn of events, Lewis and Clark abruptly ended the council. In order to get the chiefs to leave, the Corps had to force them into a canoe. When

the boat landed on shore, several warriors seized the line trying to prevent the boat's return. According to Clark, the chiefs began insulting the Corps and demanded a canoe loaded with presents. Competing expectations of the meeting **escalated** into outright conflict. Lewis and Clark were furious at what they considered the Sioux's lack of respect and appreciation for their new "white father." Clark ordered his men to arm themselves, and Lewis ordered the men on the keelboat to prepare their guns for fire. Some of the Sioux retreated, but many others prepared their own arms, including shotguns and bows.

This, as historian Stephen Ambrose has noted, was a dramatic moment. If Lewis had ordered his men to fire upon the Sioux, the whole course of American history might have come out differently. Lewis and Clark, themselves, might have died in the gunfire, putting an end to their exploration of the Missouri River. At the very least, Lewis might have turned the Sioux into staunch enemies of the United States, a turn of events that would have made it extremely difficult, if not impossible, for future expeditions to travel safely along the Missouri.

Fortunately, the Corps of Discovery and the Sioux avoided such a violent confrontation—but not because of any action taken by Lewis or Clark. Both men stood fast, refusing to back down when confronted with the Sioux's challenge. Instead, it was a Sioux leader, Black Buffalo, who stepped forward and called for an end to the hostilities. Even after the moment of crisis had passed, Clark continued to issue threats to the Sioux, warning that he was capable of wiping out "twenty such nations in one day." Clark insisted that the Corps was justified in its stance. In some sense Clark was right, since the Corps would have had to hand over a huge portion of their provisions in order to satisfy the Sioux. Yet at the same time, the Corps's failure to understand why the Sioux expected more than a few medals, a coat, and an ornamental hat, demonstrates their inability to see the Lewis and Clark expedition, and westward expansion in general, from the perspective of Native Americans.

* ME 16:322. *This quotation taken from following website: http://etext.virginia.edu/jefferson/quotations/*

For a fuller description of this encounter, see Stephen E. Ambrose, *Undaunted Courage: Meriwether Lewis, Thomas Jefferson, and the Opening of the American West* (New York: Touchstone Books, 1996), 166-168.

discussion questions

(If students do not have sufficient background to answer some questions, assign them some additional reading on Native Americans and early European settlers as homework.)

1. Why do you think that Jefferson believed that European settlement would benefit Native Americans? Based on your own historical knowledge, in what ways did the lives of Native Americans and European settlers differ? Why would this have made the encounters between them difficult?
2. Ask students to explain the ramifications of the Louisiana Purchase for the future of the new nation of European settlers, discussing the pros and cons of Jefferson's decision to make this purchase. (If necessary, assign additional reading on this subject.)
3. With the Louisiana Purchase, many Native Americans lost claim to their homelands. What else did they lose besides land?
4. Why do you think that the Sioux expected more gifts, or what they saw as reparations, from the Lewis and Clark expedition? Why would Lewis and Clark have seen things differently?

extended activities

1. Often, the expectations of Lewis and Clark stood in stark contrast to those of Native Americans. One problem that we, as historical observers, have in interpreting the encounters between Lewis and Clark and Native Americans is that the only descriptions that we have are the journal entries written by Lewis and Clark. Undoubtedly, if we could read about the same events from the perspective of Native Americans, they would have a very different story to tell. Using one of the published editions of the Lewis and Clark journals, choose an entry that describes an encounter with Native Americans and try rewriting it from the viewpoint of the Indians present at the time. Have students read to the class the two passages, one by Lewis or Clark and the other written from the perspective of a Native American. How do these accounts differ? Why?
2. In 1846, poet Walt Whitman wrote of Americans the following: "We love to indulge in thoughts of the future extent and power of this republic—because

with its increase is the increase of human happiness and liberty." In the context of westward expansion across the North American continent, whose perspective does this quotation represent? Would Native Americans have shared this viewpoint? Why or why not?

3. In the following passages, Chief Joseph of the Nez Percé Indians describes his attitude in the late 1870s toward and experience with the westward expansion of European settlers. (This Chief Joseph is the son of "Old Joseph," the Nez Percé Chief who met Lewis and Clark.) Have your students read these excerpts and then discuss their implications in class. Based on your knowledge of American history, and what had happened to Native Americans by the late 1870s, why do you think that Chief Joseph felt so angry? How do you think that someone like Jefferson or Meriwether Lewis would have responded to Chief Joseph? As a followup activity, have students choose one Native American tribe affected by westward expansion and research their responses to European settlement. How did their reactions differ? Why?

From: Chester Anders Fee, *Chief Joseph: The Biography of a Great Indian* (Wilson-Erickson, 1936), pages 4 and 78.

The first white men of your people who came to our country were named Lewis and Clark. They brought many things which our people had never seen. They talked straight and our people gave them a great feast as proof that their hearts were friendly. They made presents to our chiefs and our people made presents to them. We had a great many horses of which we gave them what they needed, and they gave us guns and tobacco in return. All the Nez Perce made friends with Lewis and Clark and agreed to let them pass through their country and never to make war on white men. This promise the Nez Perce have never broken.

For a short time we lived quietly. But this could not last. White men had found gold in the mountains around the land of the Winding Water. They stole a great many horses from us and we could not get them back because we were Indians. The white men told lies for each other...We had no friends who would plead our cause before the law councils...I labored hard to avoid trouble and bloodshed. We gave up some of our country to the white men, thinking that then we could have peace. We were mistaken. The white men would not let us alone. We could have avenged our wrongs many times, but we did not...When the white men were few and we were strong we could have killed them off, but the Nez Perce wishes to live in peace.

II. NATURAL SCIENCE AND THE TRANSFORMATION OF THE MISSOURI RIVER

Objective: Students will understand the ecological effects of man-made changes to rivers and their floodplains.
Time: 1-2 class periods, plus homework
Skills: Scientific observation and experimentation
Content: Environmental Science and History

vocabulary

abruptness – having occurred without warning or preparation
cultivated – prepared for crops
dynamic – characterized by continuous and productive activity or change
equilibrium – a state of balance between opposing forces or actions
fickle – a lack of steadfastness or constancy
fluctuation – a shifting back and forth; ebbing and flowing

lesson

When Lewis and Clark traveled up the Missouri River in the early 1800s, they encountered a river that was ever-changing, carving new channels and building new islands and sandbars. The banks of the Missouri eroded constantly, with some side channels filling with up sediment and others being created anew. One observer, George Fitch, wrote of the Missouri in 1907 that it was a "frustrated stream," a river that was "restless, seeking its lost channel, never content with the bed it occupies."*

The Missouri existed in a state of what scientists call "**dynamic equilibrium**:" where islands and side channels came and went as the river changed course, but where the overall pattern of the river remained fairly constant.

The stories of the Missouri's **fickle** nature are legendary. One of the most well-known such stories is that of Cow Island. Cow Island was a settlement on the Kansas side of the Missouri River until 1881, when a great flood shifted the river's channel, leaving at least part of Cow Island in Missouri. According to court records, this shifting of the channel created difficulty for a saloon owner named Charles Keane, who had been selling liquor legally at his establishment in Kansas for many years. After the shifting of the channel, however, Keane found his saloon technically located in Missouri, where the sale of liquor was illegal. Keane was arrested for his actions, tried in circuit court, and convicted. When the court of appeals in Kansas City heard the case, it reversed the ruling, stating that the **abruptness** of change in the river's flow left the state boundary intact.

Flooding that same year also altered life for residents in Weston, Missouri, a town established in 1837 along the banks of the river. As a result of the 1881 flooding, the Missouri cut a new main channel, joining two parts of the river that had been separated by a narrow strip of land (a meander in the river), ultimately leaving Weston high and dry—a full two and a half miles away from the river's banks. For a town whose residents had grown dependent on the Missouri for their livelihood, this shifting in the Missouri's flow created economic havoc. (For an illustration of how the closing of a meander occurs, students may refer to the diagram on page 52 of Daniel B. Botkin's *Passage of Discovery: The American Rivers Guide to the Missouri River of Lewis and Clark.* If you have internet access, you may refer to the following website for an explanation of this natural process: **www.mobot.org/MBGnet/fresh/lakes/oxbow.htm.** For information on purchasing the Botkin book, refer to the **Resources** section of this manual.)

In an effort to prevent these natural **fluctuations** in the river's course and to make river transportation more dependable, engineers began removing snags from the Missouri almost immediately after Lewis and Clark's expedition. They hoped to eliminate obstacles to boats travelling along the river. In the six years following the 1832 Congressional authorization of the removal of snags from the Missouri, more than 2,000 large trees, many of them Cottonwoods which were so vital to the Lewis and Clark expedition, were removed from the lower portion of the river. Still, some estimates indicate that almost 3 of every 7 boats travelling on the Missouri during the 19th Century were destroyed by snags. In 1910, engineers created a 6-foot deep channel between Kansas City and St. Louis, using rock and wood pilings to stabilize its banks. Individual farmers and small communities tried building levees to control the Missouri's flow. In every case, flooding of the river proved too powerful for these man-made improvements. After the tremendous flooding of the river in 1943, a disaster that forced residents of Omaha, Nebraska to navigate their city by boat, the U.S. Army Corps of Engineers began making plans to build a series of dams and levees to regulate the flow of the river. Their solution was the Pick-Sloan Plan, a plan for 5 of the world's largest earthen dams in Montana and the Dakotas, to add to Fort Peck Dam, built in Montana in the 1930s, and a 732-mile navigation canal between Sioux City and St. Louis. While successful in harnessing the river's power, these stabilization efforts created and continue to create tremendous ecological problems.

Due to the channelization of the river, the number of natural islands in the Missouri dropped from 161 in 1879 to 18 in 1954. Whereas almost 75% of the Missouri's floodplain was forested in 1880, one hundred years later, more than 90% of the floodplain had been converted to agricultural use. This conversion of the floodplain from its natural state to **cultivated** land occurred primarily during the period of intensive channelization efforts. By shoring up the banks of the Missouri, engineers have severely reduced erosion of the floodplain and thus virtually have halted the introduction of trees and other organic material necessary for wildlife habitat into the river. Suspended sediment in the river's waters has dropped from 99 to 67 percent. Fallen trees, instead of getting snagged along the banks and producing a natural feeding ground for fish and other aquatic life, now simply wash downstream. By wiping out side chutes, channelization has caused a decline of approximately 80 percent in food for aquatic life and has wiped out places where wildlife feed, reproduce and conserve energy.

The creation of a main channel also has produced a fairly uniform depth of water. Prior to channelization, many areas were less than 5 feet deep. Today, most places are more than 15 feet deep. Channelization has caused the river to speed up significantly and has produced large variations in water temperature. In parts of the Missouri below the dams, water temperature has dropped dramatically as colder water from the bottom of the river's reservoirs enters the main flow. At the same time, water temperatures between Three Forks and Great Falls have increased due to private dams and water diversions. These disruptions of the Missouri's natural patterns and variations have wreaked havoc on the river's wildlife. As a result of habitat loss, more than 30 species native to the Missouri have been placed on state and federal endangered species lists, according to a review by the U.S. Fish and Wildlife Service. In addition, approximately 70 other species are rare, according to resource managers. Only a concerted effort to restore the Missouri's natural places will help to recreate a river akin to that traveled by Lewis and Clark almost 200 years ago.

* George Fitch, "The Missouri River, Its Habits, Eccentricities Described by a Personal Friend," *The American Magazine* LXIII:6 (April 1907): 637-38.

discussion questions

1. Contrary to what most believe, clearer water is not always better. Most people typically assume that the freer that water is of sediment, the better the water will be for plants and animals living in it. To some degree, this is true. We all know that if too much sediment washes into a water source, it can choke fish and other animals and block sunlight needed by many plants in order to grow. Yet as the above discussion suggests, some sediment in the water can be beneficial. Why do you think this is true? What role might sediment play in helping plants and/or animals?
2. Many people used to assume that rivers would clean themselves, that you could dump whatever you wanted into the river and it would be transformed into something harmless. Why would this have been truer (though obviously not completely accurate) 100 or 150 years ago than it is today? What steps have been taken, at the state, local and national levels, to prevent pollution of streams and rivers in your area or in the U.S. as a whole? If students are uncertain about the legal actions that have been taken, have them research this topic as an extended activity.
3. What role does a floodplain play? Why is it so important to rivers' health that the floodplain remain forested rather than developed for agriculture or for human settlement? (*If you have internet access, you will find an additional experiment that demonstrates the role of wetlands and/or the floodplain in filtering water on The History Channel website,* **HistoryChannel.com**. *For further information on the value of natural floodplains, log onto the American Rivers website at:* **www.amrivers.org/flood1.html.**)
4. What role does a river's flow pattern play in balancing an ecosystem? How do you think that a river's flow varies over days, seasons, and years? How would these changes be important to plants and animals? How would dams have changed these natural flow patterns? (As an extended activity, students may do additional research on any of the issues addressed in these questions, especially as they may pertain to a river in your own community.)
5. Most major cities in the United States and elsewhere are located on or near significant bodies of water—oceans or rivers. As a class, try to list all of the major cities that you can think of that are located on rivers, as well as those located at the convergence of two rivers. Then verify these with a map. Why do you think that cities historically have arisen on major rivers? What are the advantages and disadvantages of living near the water (trade, recreation, tourism, etc.)? Of living at the convergence of two rivers? Of living at the falls of a river?

activities

1. As a followup activity to #5 above, have students look at a topographical map of one of the river cities they have identified, or if applicable, at a map of your own community. (Topographic maps can be obtained from the U.S. Geological Survey, USGS, through their website: **www.usgs.gov** or by phone: 1-888-ASK-USGS.) Help them identify the man-made and natural features on the map by exploring the symbols used. USGS maps use a standardized set of symbols that are explained fully on their website at: **mapping.usgs.gov/mac/isb/pubs/booklets/symbols/**. Alternatively, you may choose to present this information to your class. Students will need to

understand such concepts as the use of contour lines to show elevation, the graphic use of scale, and the function of map symbols. After students have become familiar with reading topographical maps, you may ask them to identify various natural features—rivers, streams, tributaries, mountains, wetlands—and determine their characteristics, including elevation, size, etc. Also have students identify all of the human settlements and other features, roads, rail lines, etc. labeled on the map. Can students draw any conclusions about the siting of these man-made places in relation to the natural landscape? Similarly, can they make any observations about the impact that humans have had on the physical environment?

III. SCIENCE AND POLITICS: BUILDING CONSENSUS ALONG THE MISSOURI

Objective: Students will appreciate the complexity of environmental decision-making and the necessity of compromise in such situations.
Time: 2 class periods, with possible followup
Skills: Public speaking, critical thinking and problem solving
Content: Civics, Environmental History and Science

lesson

In determining the fate of the Missouri or any river, it is never an easy choice between conservation and development. Different groups, each of which brings its own agenda to the table, have different interests in the Missouri. As with all such important public projects, any course of action will have positive and negative results, depending upon one's perspective. A manual laborer who might find work on a dam construction project may see the building of a dam in a different light than a wildlife conservationist whose primary interest is in protecting the natural habitat around the river. In the midst of such controversies, strange coalitions often arise. A hunter and a birdwatcher, for instance, who frequently find themselves on opposite sides of an issue, may unite behind their desire to prevent the destruction of river wildlife. Both of their hobbies, in this case, rest upon the same outcome—protection of the river's natural state.

In order to help students evaluate the potential positive and negative effects of damming a river, try the following role-playing game involving an imaginary session of a state legislature from a Missouri River Basin state, where students have to weigh the consequences of their actions.

Scenario:
A member of the legislature has proposed constructing an additional dam and a channel in order to prevent dangerous flooding and create hydroelectric power for the nearby residents. The channel could potentially aid barge traffic, which would help the ailing river commerce in the state. In addition, the massive construction project will create thousands of jobs for the unemployed residents of your state. Negative consequences will ensue from changing the river, as well. The natural flow of the river will be altered, hurting the fish and wildlife. The new construction will compromise the river's scenic beauty and recreation potential. Building a dam also will require the construction of a reservoir, whose waters will inundate the land owned by nearby residents. Some farmers will be aided by controlling the river, while others reliant on the natural cycles of the rivers will be hurt. Furthermore, some economists doubt whether barge traffic would actually increase as a result of the construction project, claiming instead that recreation and tourism would produce more revenue. All resident taxpayers, regardless of their views on the construction project, will have to pay more taxes in order to subsidize the barge channel.

Four towns, each bringing two representatives, attend the state legislature. Each representative comes up for reelection this November.

Town A is an impoverished town, whose primary employer is a dockyard that, in part, builds barges. The town has had a slumping economy, and some economic forecasters have projected that an increase in barge traffic could invigorate the town's commercial fortunes and create jobs. Polls indicate that the citizens of Town A support the construction of a dam and barge channel.

Town B is a relatively wealthy town with few employment difficulties. While the dam would directly affect few members of the town, many citizens enjoy recreating on the river. Other members of the town oppose the dam for environmental reasons. The wealthiest citizens, who are influential in elections, support the dam to aid the state's commercial viability; and few are overly concerned about the additional tax burden. Polls indicate that the citizens of Town B oppose the construction of the dam and channel by a slight margin.

Town C is an old farming town that borders the Missouri River. Farmers in the town are divided in their feelings about the construction project. Many of those whose land would border the new channel support the project, believing that the cost of getting their crops to market will decrease with the aid of barges. Others, however, rightly fear that the resevoir created by the dam will inundate their farms, taking valuable cropland out of production, and in some cases, destroying their homes. If the dam is constructed, farmers in the town who will be adversely affected are demanding some sort of financial compensation, especially given the added tax burden. Polls indicate that Town C, by and large, opposes the construction plan.

Town D is a town in the center of the state with no access to the Missouri River. The distance to the river is so great that few members of the town ever vacation there or use the river for recreation purposes. Without any direct interest in the construction, the town members are divided. Some contend that conserving the natural splendor of the river is of paramount importance. Others, out of concern for the impoverished members of the state, support the dam as a means of creating temporary jobs, regardless of the tax implications. Town D is undecided on the matter, with voters fairly apathetic about the issue.

The rest of the class is divided into two or more lobbying groups. One lobbying group is an environmental group that opposes the dam due to the tremendous costs the dam will create for the wildlife in the area. The second lobbying group is a welfare coalition group that argues that the dam will have great benefits for the unemployed, as well as provide a cheap power source for the state. Other possible lobbying groups include: lobbyists from the state's major power company; representatives of an association for sporting goods retailers; representatives from a homeowners association that is concerned about flooding; and members of Ducks Unlimited, or some other pro-hunting group, interested in preserving habitat for wildlife.

Each lobbying group is to present its case to the eight members of the legislature. Legislative members can ask questions to the lobbying groups. After the presentations have ended, the legislators may try to compromise with each other in order to change the bill to reach a consensus. After the members attempt a compromise, they vote on the proposal. Each individual member of the legislature gets a single vote. In case of a tie, the Speaker of the House (the teacher) breaks the tie on the basis of the arguments presented.

Questions

1. What was the most persuasive argument on the pro-construction side? What was the best argument against the construction of the dam and channel?
2. Was there any room for compromise? As a class, discuss the costs and benefits of the final outcome.
3. What does this exercise teach you about the nature of a representative democracy? And of the difficulties that residents along the Missouri have faced over the years?
4. If this is a "real-life" situation in your community, you may want to ask students to write letters to a city council member expressing their views.

Resources:

Books:

Botkin, Daniel B. *Passage of Discovery: The American Rivers Guide to the Missouri River of Lewis and Clark.* New York: Berkley Publishing Group, 1999.

(Botkin's book is a great tool for teachers to use in the classroom and on field trips. It is the first guide to the Lewis and Clark trail that combines the human history of the Voyage of Discovery with the natural history of the nation's longest river. *Passage of Discovery* contains 42 essays on historic sites, refuge lands, riverside towns, and habitat restoration projects, includes a foreword by noted historian Stephen Ambrose, an afterword by Robert Redford, and is beautifully illustrated throughout by Garry Pound. **To order *Passage of Discovery: The American Rivers Guide to the Missouri River of Lewis and Clark* please call 1-888-820-1050 and give code HCTM to get the special discount teacher's rate of $9.95 (retail $15.95) per guidebook, plus shipping, handling, and sales tax, if applicable.)**

Ambrose, Stephen E. *Undaunted Courage: Meriwether Lewis, Thomas Jefferson, and the Opening of the American West.* New York: Simon & Schuster, 1996.

Jackson, Donald. ed. *Letters of the Lewis and Clark Expedition, with Related Documents.* Urbana: University of Illinois Press, 1978.

Moulton, Gary. ed. *The Journals of the Lewis & Clark Expedition.* Lincoln: University of Nebraska Press, 1988.

Vestal, Stanley. *The Missouri.* Lincoln: University of Nebraska Press, 1996, reprint.

Ward, Maurine Carr. ed. *Winter Quarters: The 1846-1848 Life Writings of Mary Haskin Parker Richards.* Logan: Utah State University Press, 1996.

A list of additional books on the Lewis and Clark expedition for educators can be found on following website: http://www.nps.gov/focl/erp5.htm

Natural Science Teaching Resources:

Rivers Curriculum Guides—a series of six river-based units, published by Dale Seymour Publications.

Water Activities Teaching Environmental Responsibility—published by the Miami Soil and Water Conservation District (SWCD), Troy, OH.

Project Wet—(Water Education for Teachers) an international, interdiciplinary water science education program for formal and informal educators of K-12 students. For information contact Sally Unser at Montana State University.
e-mail: projectwet@montana.edu
website: www.montana.edu/wwwwet

Internet resources:

http://www.amrivers.org
http://www.lewis-clark.org/
http://www.nps.gov/focl/erp5.htm
http://www.lewisandclark.org/
http://xroads.virginia.edu/~hyper/journals/journals.html

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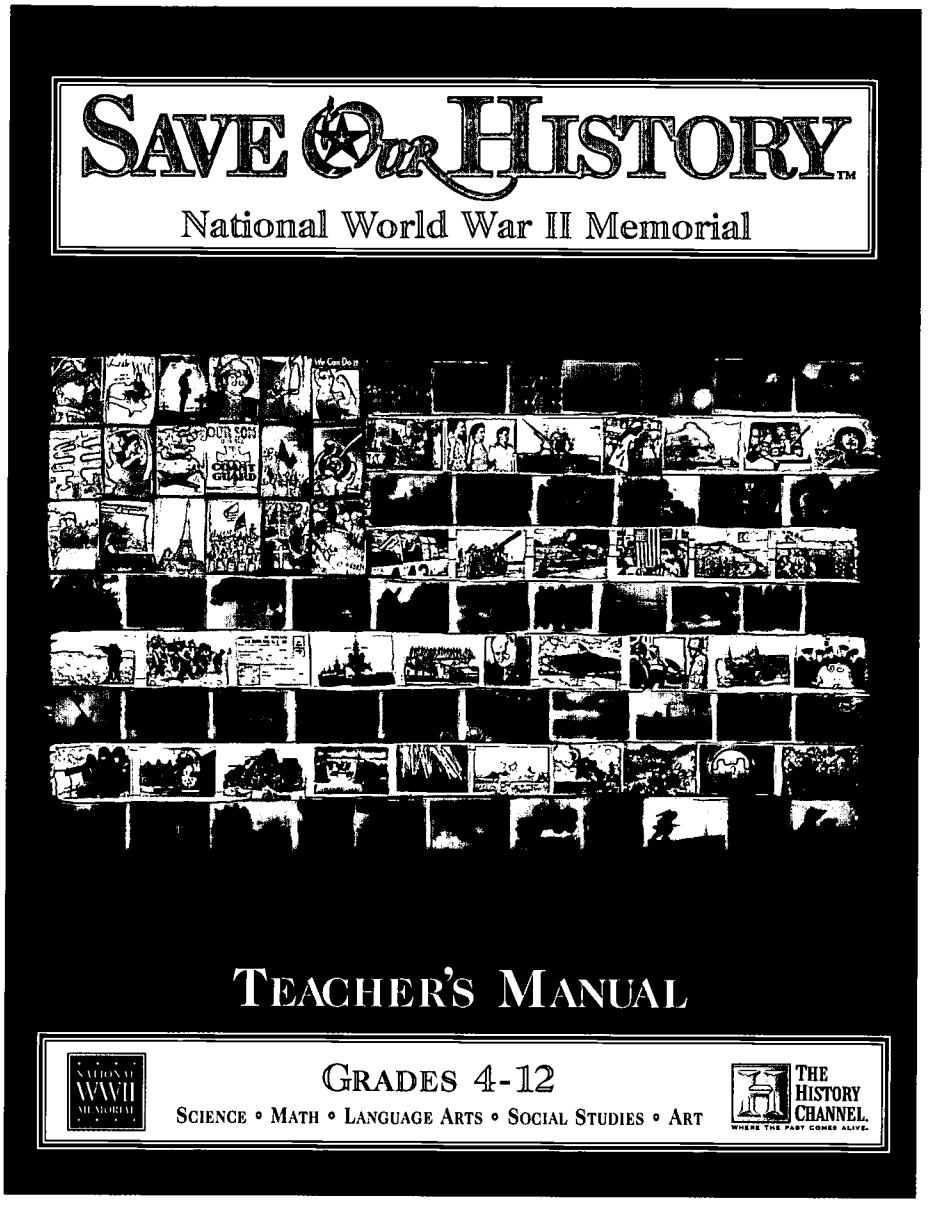

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