

LEARN NC

Vietnam waterways: Ecology and conservation

In this interdisciplinary lesson for grades 6-8, students will examine the relationship between the physical environment and cultural characteristics of the Mekong River valley in Vietnam. Students will evaluate the current conditions of the Mekong River and suggest long-range solutions for improving, restoring, or preserving the quality of the river.

A lesson plan for grades 6–8 Information Skills, Science, and Social Studies

BY EDIE MCDOWELL

This interdisciplinary lesson introduces students to river ecology and conservation in conjunction with their social studies examination of the history, culture, and geography of Vietnam. Students will examine the relationship between the physical environment and cultural characteristics of the Mekong River valley in Vietnam. Students will be (virtually) sent as a team of local experts in watershed quality to evaluate the current conditions of the Mekong River in Vietnam. Each team will research and write a “Mekong River Watershed Team Report” to be presented to Mekong River citizens, rice farmers, and government officials summarizing the environmental findings and suggesting what long-range solutions might be taken to improve, restore, or preserve the quality of the Mekong River.

Learning outcomes

Students will understand that rivers provide invaluable natural resources: water for drinking, agriculture, transportation, industry, manufacturing, energy, and recreation (for human civilization and survival), and habitats (for plants and animals). They will recognize the unique environmental interdependence in which river systems connect to land and that people connect to rivers, either directly or indirectly, through their watershed or drainage basin. Finally, students will assess the ongoing need for worldwide water conservation through various methodologies: sustainable use, preservation, and restoration. Students will research current watershed conservation projects in Vietnam as well as in their own local river system.

Teacher preparation

TIME REQUIRED FOR LESSON

Teachers should schedule eight to ten 55-minute class periods or five block periods to complete the activities in this lesson. Portions of the research may be assigned as independent homework.

MATERIALS NEEDED

- Paper and pencils/pens
- Art supplies (multi-media materials such as water color and acrylic paints, brushes, pastels, crayons, markers, colored pencils).

Pre-activities

Students should have a basic understanding of the water cycle and water systems. They should be able to explain why early human settlements were usually located along waterways. They should be able to cite examples of world civilizations that were originally established at ocean ports, lakes, or along rivers.

Before the lesson, introduce students to river ecology and review the water cycle. The lesson plan “[Rivers: Lifelines of the Land](#)” from the National Geographic website offers an excellent introduction. While the lesson focuses primarily on dams, the “suggested procedure” section provides a useful overview of how rivers have long been sources of transportation, food, and water. The National Geographic lesson plan also links to the page “[Geography Action! Rivers 2001](#),” which enables students to explore the parts of a river system via an animated example. To cover key words for the study of river systems and watersheds, use the [printable pdf](#).

Activities



(Photograph by Margery H. Freeman)

Learn more

RELATED PAGES

- [Salt trading in Asia](#): In this interdisciplinary lesson, students explore the mineral salt from a variety of perspectives — scientific, geographic, and cultural. The lesson incorporates images of salt production in Nepal and Vietnam. It may be used with grade 4 or grade 7.
- [The regions of North Carolina](#): In this lesson, students analyze the differences between North Carolina's geographical regions: the Mountains,

- After an overview of the water cycle, the parts of a river system, and watersheds, ask students to use a map of Vietnam to locate main waterways. Map images are available at the following links:
 - [Shaded relief map](#) from LEARN NC
 - [Black and white political map](#) from National Geographic Xpeditions
 - [Political map in color](#) from LEARN NC
- Have students work in small groups to find at least three maps of Vietnam. Each group should find a variety of maps: topographical, political, historical, satellite imagery, environmental, territorial, etc. Allow students time to make observations, comparisons, and draw conclusions. Give students sketch paper, colored pencils, and rulers. Ask each student to carefully sketch a map of Vietnam including its borders, main cities, rivers, a compass rose, and any other information they found interesting. Share and discuss results.
- Read students the following passage, which comes from “Vietnam: Educator’s Guide,” by Steve Goldberg:

Vietnam’s geography is often referred to as a shoulder pole with a rice basket at each end, making the shape of an S. This analogy is particularly apt, because the heavily populated, rice-producing areas are in the north and the south of the country, while the middle of the country is thin like a pole. At its thinnest point, Vietnam is only about thirty miles wide.

Some of the major cities you may have heard of in Vietnam are located in the following regions:

- North — Hanoi
- Middle — Hue and Danang
- South — Saigon (now officially called Ho Chi Minh City)

Vietnam has two major river deltas, the Mekong River in the south and the Red River in the north. To its east, Vietnam borders the South China Sea. A well-known road that hugs the east coast of Vietnam is Route 1.

- To illustrate the image of Vietnam as a shoulder pole, show students images of Vietnam residents carrying shoulder poles:
 - [Two women carry trays suspended from shoulder poles in street at Hoi An](#), from LEARN NC
 - Two photos from Clemson University professor Edwin E. Moise’s collection of Vietnam photos, “Transportation in North Vietnam Tended to be Simple”:
 - Photo #2: “Load of bamboo on bicycle. Woman in background carrying baskets on shoulder pole.”
 - Photo #4: “Woman carrying large baskets on shoulder pole.”
- Optional Kinesthetic Activity:** Have students practice using a shoulder pole to test the practicality of this tool for transporting baskets of rice, beans, or other dry objects from one place to the next. You will need bamboo poles at least 5 feet in length, baskets of approximately the same size, and something to carry (bean bags aren’t messy if the baskets are spilled). Organize a challenge for small groups (a relay race against the clock or a competition between other teams if you have the materials for several shoulder poles). Students should gain an appreciation for traditional work in Vietnam. The activity also gives students a point of reference for further study of the Mekong River, rice farming, and transportation.
- Have students label the regions of Vietnam and their major cities on their maps. Review the meaning of the word *delta* (an area formed from the deposition of sediments at the mouth of a river that is usually triangular or fan-shaped in appearance) and ask students to draw and label:
 - the Mekong River, and its delta in the south
 - the Red River, and its delta in the north.
 - the South China Sea, bordering Vietnam in the east
- Discuss the uses of rivers and watersheds. Have students brainstorm ways in which a river system is an essential natural resource. Students’ answers should include some or all of the following information:

River systems support human civilization and survival by providing water for drinking, agriculture, transportation, industry, manufacturing, energy, and recreation. River systems also provide habitats for plants and animals.
- Ask students to review the following river system vocabulary:
 - river source
 - river mouth
 - upstream
 - downstream
 - tributary
 - main river
 - meanders
 - wetlands
 - floodplain
 - delta
 - watershed

The definitions for these terms (PDF) and an [interactive image](#) are available from the National Geographic Society’s *Geography Action!* website.

- After reviewing key points about the geography of Vietnam, have students access the article “[IBFM Puts Triple Bottom Line Assessment into Practice](#),” on the website of the Mekong River Commission for Sustainable Development. This 2006 annual report summarizes the efforts of the Mekong River Commission to identify and combat ecological problems. The article demonstrates the need to consider various purposes and perspectives, both

the Piedmont, and the Inner and Outer Coastal Plain.

- [Regions of Nepal: A virtual trek](#): This lesson for grade seven helps students understand the connections between geography and culture. Students experience a virtual trek through the different regions of Nepal, conduct research about the ethnic groups living in each region, and maintain travel logs documenting what they’ve learned.

RELATED TOPICS

- [Learn more about Asia, Mekong River, Vietnam, conservation, deltas, ecology, geography, maps, rivers, science, social studies, water quality, watersheds, and world cultures.](#)

Help

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physical and cultural, in making decisions that will affect all stakeholders. The article is not too technical or difficult, but less advanced readers may need assistance in interpreting some of the vocabulary.

10. Direct students to the [main page of the Mekong River Commission](#). This site summarizes the mission, vision, and cooperative nature of the MRC, and links to many articles and projects helpful for this particular assignment. [Note: While the information is helpful, the site contains consistent typing and spelling errors, probably due to the fact that it has been translated into English. In a tangential grammar and mechanics lesson, students may also be asked to edit the typographical errors in the vision statement!]
11. Have students access the Mekong River Commission's [River Awareness Kit](#), which introduces students to "River Science," offering a streaming video overview of the river, its geography, the people who use it, etc.
12. Ask students to use their understanding of the river system vocabulary above to apply each term to the Mekong River on the [map of Vietnam and Southeast Asia](#). Ask students how far north they would have to travel from the Mekong Delta to locate the river source. Tell students that they will now take a virtual tour of the Mekong River in order to learn more. Students will need to take written notes of their visual and auditory observations.
13. Using one of the two following options, take students on a virtual tour of Vietnam:
 - o **Option 1:** Take students on a virtual tour of Vietnam, the Mekong River, and its delta via the [Travel Adventures](#) website. This site allows visitors to tour Vietnam virtually using Google Earth software. The virtual tour includes personal travel impressions in stories and pictures from Mekong Delta, Mekong River, Vietnam.
 - o **Option 2:** The [Visual Geography](#) website offers an interactive tour of Vietnam through which students can learn about climate, food, houses, jobs, nature, religion, shops, transportation, streets, geography, history, and statistical data. Images and text accompany maps, flags, and other invaluable information in a user-friendly format.
14. After touring at least one of the above collections, have students listen to the following audio recordings and read the accompanying text written by [Kristin Post](#), who made the recordings:
 - o **Nature and people in Vietnam:**

This was recorded as part of a multi-day Mekong Delta tour that started in Saigon (Ho Chi Minh City, Vietnam) and finished in Phnom Penh, Cambodia. It is a unique experience to cross the border over water rather than overland. We were amongst the first groups to cross the Vietnam-Cambodia border by boat in 2001.

Though there are many birds close by, you can also hear townspeople, tourists, and honking horns from a nearby road.

[Download recording](#) (Right-click or option-click) | [About the recording](#)

- o **Bird calls in the Mekong delta:**

Many types of birds make their home among the rice paddies, homes and waterways of the Mekong Delta. To me, this birdcall does not sound like typical waterfowl in America.

From my journal:

" 'Stork garden' on a small boat through narrow canal. Really 'herons' — very pretty. Ride on the boat."

[Download recording](#) (Right-click or option-click) | [About the recording](#)

15. Have students view the photograph "[Aerial View of Mekong River Joining Tonle Sap Lake Near Siem Reap](#)" and read the accompanying text.
16. Following this tour, allow students time to organize their notes, discuss results in small groups, and draw conclusions regarding the Mekong River and its importance to the citizens of Vietnam. (Allow at least one class period for this activity.)
17. **Challenge assignment: Mekong River Watershed Team Report**
Give students the following assignment:

You have just completed your training at the [Watershed Academy](#). You have been sent as a team of local experts in watershed quality to evaluate the current conditions of the Mekong River in Vietnam. Research and write a Mekong River Watershed Team Report addressing these questions:

- o Why is this river essential to Vietnam?
- o Is the river healthy?
- o How do people's actions within the Mekong River watershed affect the overall quality of the river? (Remember that anything that affects a watershed may eventually impact its tributaries and river as well as the water body at the mouth of the river.)
- o What kinds of human activities are causing damage to river systems?
- o What are some of the indications that a river system is being damaged?
- o What is being done to combat the negative effects of the human activities?
- o What long range solutions might be taken to improve, restore, or preserve the quality of the Mekong River?

With your team, research the library and the web to locate at least three resources with information to answer these questions.

Document your sources of information and evidence. Outline the introduction, main points, and conclusion of your team presentation. Synthesize information in a final product (written report, essay, multimedia presentation, or directive memo format) to share conclusions. In your final report, your team should present its findings to a group of citizens, rice farmers, and government officials within the Mekong Delta. Peers will serve as the target audience of citizens and government officials for each Mekong River Watershed Team Report. Each team should devise its own plan to share responsibilities for these tasks. Visual tools for each team presentation might include the maps of Vietnam created earlier in the lesson.

18. Allow at least five class periods for students to complete this assignment, and one period for presentations. Students may produce a standard written report, or they may use a directive memo format. If students opt to use this format, instruct them to consult the [memo-writing page](#) from the Online Writing Lab website of Purdue University. For this environmental report, the *audience* should be concerned Mekong Delta citizens, rice farmers, and government officials. The *purpose* of the memo should be to summarize findings of watershed study. The summary should include the answers to the questions posed in the assignment. Each question may be addressed in a segment of the summary report. *Directives* should set forth long-range solutions to improve, restore, or preserve the quality of the Mekong River.

Assessment

Students will create a rubric for self-evaluation to reflect the following objectives:

1. Participation in information-gathering to evaluate the current conditions of the Mekong River in Vietnam
2. Proper source documentation and data collection
3. Final Mekong River Watershed Team Report (directive memo or other format) including watershed quality summary and conclusions
4. Oral presentation of Mekong River Watershed Team Report which:
 1. creates a coherent organizing structure appropriate to purpose, audience, and context
 2. orients the reader/listener to the scene, the people, and the events
 3. engages the reader/listener by establishing a context and creating a point of view
 4. establishes the significance of events
 5. uses conventions of grammar and mechanics

Optional extensions

- Visit the Water Science Activity Center on the US Geological Survey's *Water Science for Schools* website. This interactive site allows students to answer challenge questions, give opinions, and participate in questionnaires concerning water issues. Their answers will be entered into a database. After answering, students can access a table showing how those in other states and countries responded. Students can examine this data to see how others across the country (and world) have the same or different ideas, thoughts, and opinions about water. Your class can have a discussion about why someone 2,000 miles away responded differently.
- You may also wish to extend the lesson by having students conduct a similar environmental investigation of a local river, stream, or watershed.

Supplemental information

- [Surf Your Watershed](#) from the U.S. Environmental Protection Agency. This website allows students to find their watershed using geographical information (city, county, state, and stream name, or 8-digit USGS hydrologic catalog code number). Once you have found your watershed, you will be able to find citizen-based groups that are active in your watershed. The site also includes a link to "The Watershed Patch Project," a PDF document that lists watershed activities designed for schools, science clubs, and community organizations.
- [Water Science for School](#), from the US Geological Survey, includes pages for topics including water basics, the water cycle, and water use. This resource offers helpful definitions, images, and examples to define the water cycle, river system, and watershed, and links to other educational sites and activities.
- [LEARN NC resources about the Mekong River](#)
- [Rice Farming and Rural Life in Vietnam](#), a LEARN NC slideshow
- ["The Mekong, Seen Over Handlebars,"](#) a *New York Times* article and slideshow about a journey through the Mekong Delta.
- [LEARN NC resources about coastal trade](#)

Critical vocabulary

- River system
- River source
- River mouth
- Upstream
- Downstream
- Tributary
- Main river
- Meanders
- Wetlands
- Floodplain
- Delta
- Watershed
- Conservation
- Preservation
- Restoration
- Audience
- Purpose
- Memo
- Directive
- Summary

Websites

- Maps of Vietnam:
 - [Shaded relief map](#) from LEARN NC
 - [Black and white political map](#) from National Geographic Xpeditions
 - [Political map in color](#) from LEARN NC
- Image of shoulder poles:
 - [Two women carry trays suspended from shoulder poles in street at Hoi An](#), from LEARN NC
- National Geographic Society's Geography Action! website:
 - [Interactive river image](#)
 - [Vocabulary terms and definitions \(PDF\)](#)
- Mekong River Commission website:
 - ["IBFM Puts Triple Bottom Line Assessment into Practice"](#)
 - [Main page of the Mekong River Commission](#)
 - [River Awareness Kit](#)
- Virtual tours of Vietnam:
 - [Travel Adventures](#)
 - [Visual Geography](#)
- [Memo-writing page](#) from the Online Writing Lab website of Purdue University
- [Water Science Activity Center](#) from the US Geological Survey

• North Carolina Essential Standards

◦ INFORMATION AND TECHNOLOGY SKILLS (2010)

▪

Grade 6

- 6.RP.1 Apply a research process for collaborative or individual research. 6.RP.1.1 Implement a research process collaboratively. 6.RP.1.2 Implement a research process independently.

▪

Grade 7

- 7.RP.1 Apply a research process to complete given tasks. 7.RP.1.1 Implement a collaborative research process activity that is group selected. 7.RP.1.2 Implement an independent research process activity that is student selected.

▪

Grade 8

- 8.RP.1 Apply a research process to complete project-based activities. 8.RP.1.1 Implement a project-based activity collaboratively. 8.RP.1.2 Implement a project-based activity independently.

▪ **SCIENCE (2010)**

- 8.E.1 Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.
 - 8.E.1.1 Explain the structure of the hydrosphere including: Water distribution on earth Local river basins and water availability
 - 8.E.1.2...

◦ **SOCIAL STUDIES (2010)**

▪

Grade 7

- 7.G.2 Apply the tools of a geographer to understand modern societies and regions. 7.G.2.1 Construct maps, charts, and graphs to explain data about geographic phenomena (e.g. migration patterns and population and resource distribution patterns). 7.G.2.2 Use...

North Carolina curriculum alignment

INFORMATION SKILLS (2000)**Grade 7**

- **Goal 3:** The learner will RELATE ideas and information to life experiences.
 - **Objective 3.02:** Collect and compare information about diverse cultures, environments, and peoples.
 - **Objective 3.04:** Relate cultural similarities and differences to personal heritage and environments.

SCIENCE (2005)**Grade 7**

- **Goal 1:** The learner will design and conduct investigations to demonstrate an understanding of scientific inquiry.
 - **Objective 1.05:** Analyze evidence to:
 - Explain observations.
 - Make inferences and predictions.
 - Develop the relationship between evidence and explanation.

SOCIAL STUDIES (2003)**Grade 7**

- **Goal 2:** The learner will assess the relationship between physical environment and cultural characteristics of selected societies and regions of Africa, Asia, and Australia.
 - **Objective 2.01:** Identify key physical characteristics such as landforms, water forms, and climate and evaluate their influence on the development of cultures in selected African, Asian and Australian regions.

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LEARN NC, a program of the University of North Carolina at Chapel Hill School of Education, finds the most innovative and successful practices in K–12 education and makes them available to the teachers and students of North Carolina — and the world.



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For more great resources for K–12 teaching and learning, visit us on the web at www.learnnc.org.