Appendix

Supplemental Material
A1 Career Launch
A list of potential career ideas for students and related professional associations.

A2 Major Tributaries of the Mississippi River
A list of major tributaries and their locations along the Mississippi River.

A3 Bridge Crossings of the Upper Mississippi River
A list of major bridge crossings and their bridge descriptions.

A4 Mississippi River Watershed States Chart
Includes information such as state tree, bird, flower, fish, and mammal.

A5 Endangered Species by State
A list of of threatened and endangered species by State.

A6 Glossary
A list of words and definitions throughout this guide that students are expected to learn.

A7 Education Standards
A table showing the national learning standards used in preparing this guide and the corresponding state standards for Illinois, Iowa, Missouri, Minnesota, and Wisconsin.

A8 Planning Chart
A matrix of information (lesson objectives, lesson standards, etc.) for teachers to use in selecting and planning lessons in the guide.

A9 Bibliography
A list of references and resources used in creating this guide.

A10 Image Credits
A list of all image and graphic credits.
To find a speaker for the classroom, contact your local chapter of the Professional Association. The rangers from the U.S. Army Corps of Engineers, U.S. Fish & Wildlife Service, or your State Department of Natural Resources would be able to speak on many of the topics. Visit the Department of Labor’s website for a complete list of occupations at www.occupationalinfo.org.

**Anthropologist**
*Description:* Studies human beings and how they behave  
*Contact:* American Anthropological Association (www.aaanet.org)

**Archeologist**
*Description:* Studies the past by looking for remains and artifacts left by people who lived long ago  
*Contact:* Society for American Archaeology (www.saa.org)

**Biologist**
*Description:* Studies living organisms  
*Contact:* American Institute of Biological Sciences (www.aibs.org)

**Botanist**
*Description:* Studies plants, flowers, and plant-like things such as moss and seaweed  
*Contact:* Botanical Society of America (www.botany.org)

**Business developer**
*Description:* Identifies new business opportunities  
*Contact:* The Society for Business Development Professionals (www.sbdp.org)

**Career counselor**
*Description:* Helps you find your career path  
*Contact:* Your local high school career or guidance counselor

**Cartographer**
*Description:* Makes maps  
*Contact:* North American Cartographic Information Society (www.nacis.org)

**City planner**
*Description:* Responsible for the city’s general plan, zoning, municipal land decisions, and environmental studies  
*Contact:* American Planning Association (www.planning.org)

**Civic leader**
*Description:* Leader in municipal affairs  
*Contact:* City, county, or state offices

**Climatologist**
*Description:* Studies climate, specifically weather conditions over a period of time  
*Contact:* American Association of State Climatologists (www.stateclimate.org)

**Conservation officer or warden**
*Description:* Protects and enforces conservation values and laws  
*Contact:* State Department of Natural Resources

**Conservationist**
*Description:* Advocates for the protection of all the species in an ecosystem with a strong focus on the natural environment  
*Contact local:* U.S. Fish & Wildlife Service (www.fws.gov), U.S. Army Corps of Engineers (www.usace.army.mil), or Nature Conservancy (www.nature.org)

**Ecologist**
*Description:* Studies living things, their environment, and their interactions  
*Contact local:* U.S. Fish & Wildlife Service (www.fws.gov), U.S. Army Corps of Engineers (www.usace.army.mil), or Nature Conservancy (www.nature.org)
Economist
Description: Studies economic relationships and solution of problems arising from production and distribution of goods and services
Contact: National Association for Business Economics (www.nabe.com)

Employment coordinator
Description: Finds, screens, and interviews potential employees for their organization
Contact: Society for Human Resources Management local chapter (www.shrm.org)

Engineer
Description: Applies scientific knowledge, mathematics and ingenuity to develop solutions for technical problems. Engineers design materials, structures, machines and systems while considering the limitations imposed by practicality, safety and cost. e.g. Hydroelectric engineer
Contact: National Society of Professional Engineers (www.nspe.org)

Farmer
Description: Raises living organisms for food or raw materials
Contact: Local 4-H, FFA (Future Farmers of America), National Farmers Association (www.nfo.org)

Fisherman
Description: Captures fish and other animals from a body of water, or gathers shellfish
Contact local: Commercial Fishermen of America (www.cfafi sh.org)

Forester
Description: Makes sure that the forest and all the wildlife that lives there is healthy
Contact local: U.S. Fish & Wildlife Service (www.fws.gov), U.S. Army Corps of Engineers (www.usace.army.mil), or Nature Conservancy (www.nature.org)

Geologist
Description: Studies nonliving things the Earth is made of
Contact: Geological Society of America (www.geosociety.org)

Glaciologist
Description: Studies glaciers and their effects on the landscape and our climate
Contact: American Association for the Advancement of Science (www.aaas.org)

Historian
Description: Studies the passage of time and the events that happen within that passage
Contact: American Historical Association (www.historians.org)

Hydrogeologist
Description: Studies the ways that groundwater moves through the soil and rock of the earth
Contact: Geological Society of America (www.geosociety.org)

Hydrologist
Description: Studies the movement, distribution, and quality of water throughout the Earth
Contact: Geological Society of America (www.geosociety.org)

Lock master
Description: Manages canals, locks, and related property
Contact: U.S. Army Corps of Engineers (www.usace.army.mil)

Merchant mariner
Description: Operates and maintains numerous types of watercraft
Contact: National Mariners Association (www.nationalmariners.org)

Microbiologist
Description: Studies bacteria and other micro-organisms
Contact: The American Society For Microbiology (www.asm.org)

Mineralogist
Description: Examines, analyzes, and classifies minerals, gems, and precious stones
Contact: Geological Society of America (www.geosociety.org)

News reporter
Description: Collects and analyzes information about newsworthy events and writes news stories for publication or broadcast
Contact: Society of Professional Journalists (www.spj.org)

Ornithologist
Description: Studies birds
Contact: Ornithological Societies of North America (www.osnabirds.org)
A2: Major Tributaries of the Mississippi River

Arkansas River in Arkansas  
Big Black River in Mississippi  
Big Muddy River in Illinois  
Chippewa River in Wisconsin  
Crow River in Minnesota  
Des Moines River in Iowa  
Illinois River in Illinois  
Iowa River in Iowa  
Kaskaskia River in Illinois  
Maquoketa River in Iowa  
Minnesota River in Minnesota  
Missouri River in Missouri  
Ohio River in Kentucky  
Red River in Louisiana  
Rock River in Illinois  
Skunk River in Iowa  
St. Croix River in Minnesota and Wisconsin  
Wapsipinicon River in Iowa  
White River in Arkansas  
Wisconsin River in Wisconsin  
Yazoo River in Mississippi
A3: Bridge Crossings on the Upper Mississippi River

Bridges over the Mississippi River that have notable engineering or landmark significance. Listed in order from the source of the river to its mouth.

**Stone Arch Bridge**
Former Great Northern Railway (now pedestrian) bridge at Saint Anthony Falls in downtown Minneapolis.

**I-35W Mississippi River Bridge**
This bridge collapsed catastrophically on August 1, 2007, killing 13 and injuring over 100. It was replaced by the I-35W Saint Anthony Falls Bridge, which opened in September 2008, ahead of schedule and on budget.

**I-90 Mississippi River Bridge**
Connects La Crosse, Wisconsin to Winona County, Minnesota, located just south of Lock and Dam No. 7.

**La Crosse Rail Bridge**
This bridge was one of the first 15 bridges built to cross the Mississippi River. Built in 1876, it is a swing bridge that spans the river between La Crescent, Minnesota, and La Crosse, Wisconsin, and carries Amtrak’s Empire Builder train.

**Mississippi River Bridge**
Also known as the Big Blue Bridges, it is a combination of two individual bridges, the Cass Street and Cameron Avenue Bridges, that cross the east channel of the Mississippi River connecting downtown La Crosse, Wisconsin, to Barron Island.

**Black Hawk Bridge**
Connects Lansing in Allamakee County, Iowa, to rural Crawford County, Wisconsin, locally referred to as the Lansing Bridge and documented in the Historic American Engineering Record.

**Julien Dubuque Bridge**
Joins the cities of Dubuque, Iowa, and East Dubuque, Illinois and is listed in the National Register of Historic Places.

**Savanna-Sabula Bridge**
Truss bridge and causeway that connects the city of Savanna, Illinois with the island city of Sabula, Iowa. The bridge carries U.S. Highway 52 over the river. It is also the terminus of both Iowa Highway 64 and Illinois Route 64. Added to the National Register of Historic Places in 1999.

**Fred Schwengel Memorial Bridge**
Four-lane steel girder bridge that connects Le Claire, Iowa and Rapids City, Illinois. Completed in 1966.

**I-74 Bridge**
Originally known as the Iowa-Illinois Memorial Bridge, connects Bettendorf, Iowa and Moline, Illinois.

**Government Bridge**
Connects Rock Island, Illinois and Davenport, Iowa, adjacent to Lock and Dam No. 15. The fourth crossing in this vicinity, having been built in 1896.

**Rock Island Centennial Bridge**
A five-arched bridge connecting Rock Island, Illinois and Davenport, Iowa, opened in 1940.

**Norbert F. Beckey Bridge**
Connects Muscatine, Iowa to Rock Island County, Illinois, became the country’s first bridge to use light-emitting diode lights to decoratively illuminate the facade of the bridge.
**Great River Bridge**
Cable-stayed bridge connecting Burlington, Iowa to Gulf Port, Illinois.

**Fort Madison Toll Bridge**
Also known as the Santa Fe Swing Span Bridge. At the time of its construction, it was the longest and heaviest electrified swing span on the river. It connects Fort Madison, Iowa and unincorporated Niota, Illinois. Listed in the National Register of Historic Places since 1999.

**Bayview Bridge**
Cable-stayed bridge bringing westbound U.S. Highway 24 over the river, connecting the cities of West Quincy, Missouri and Quincy, Illinois. Eastbound U.S. 24 is served by the older Quincy Memorial Bridge.

**Clark Bridge**
Also known as the Super Bridge as the result of an appearance on the PBS program, *Nova*. This cable-stayed bridge connects West Alton, Missouri and Alton, Illinois, was built in 1994, and carries U.S. Route 67 across the river. It is the northernmost river crossing in the St. Louis metropolitan area and replaces the Old Clark Bridge, a truss bridge built in 1928, named after explorer William Clark.

**Old Chain of Rocks Bridge**
Located on the northern edge of St. Louis, the old Chain of Rocks Bridge is notable for the 22-degree bend that occurs in the middle of the crossing, which was necessary for navigation on the river. This bridge was once part of U.S. Route 66, but is now used only by pedestrians and bicyclists. Vehicle traffic now travels across the river on nearby I-270.

**McKinley Bridge**
Named for William B. McKinley, CEO of Illinois Traction System Electric Railway. It connected St. Louis, Missouri, to Venice, Illinois, in 1910. In 1978, the railroad line was closed. The bridge closed to all traffic in 2001, but was reopened in 2007.

**Martin Luther King Bridge**
Formerly known as the Veteran's Bridge, this cantilever truss bridge connects St. Louis, Missouri, with East St. Louis, Illinois. It was built in 1951 as a toll bridge. In 1967, the bridge fell into disrepair when the toll-free Poplar Street Bridge opened. In 1968, the bridge was renamed after Martin Luther King, Jr. In 1987, the toll was removed and repairs begun.

**Eads Bridge**
Combined road and railway bridge, connecting St. Louis, Missouri and East St. Louis, Illinois. When completed in 1874, it was the longest arch bridge in the world, with an overall length of 6,442 ft (1,964 m). The ribbed steel arch spans were considered daring, as was the use of steel as a primary structural material; it was the first such use of true steel in a major bridge project.

**Poplar Street Bridge**
Officially the Bernard R. Dickmann Bridge, the Poplar Street Bridge was completed in 1967, crossing the Mississippi River between East St. Louis, Illinois, and St. Louis, Missouri, just south of the Gateway Arch. The bridge is crossed by approximately 100,000 vehicles daily, making it the second most heavily used bridge on the river after the Dartmouth Bridge in Minneapolis, Minnesota.

**Jefferson Barracks Bridge**
Often called the J.B. Bridge, it is a pair of bridges that cross the Mississippi River from St. Louis, Missouri, to Columbia, Illinois. The 909-foot steel arch bridges were built nine years apart, with the first opening in 1983.

**Chester Bridge**
Truss bridge connecting Route 51 in Missouri with Illinois Route 150, between Perryville, Missouri and Chester, Illinois. The bridge can be seen in the beginning of the 1967 film, *In the Heat of the Night*. In the 1940s, the main span was destroyed by a tornado.
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<td>White Bass</td>
<td>Scissor-tailed Flycatcher</td>
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<td>Coyote</td>
<td>Walleye</td>
<td>Ring-necked Pheasant</td>
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<td>Raccoon</td>
<td>Channel catfish</td>
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<td>Guadalupe bass</td>
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<td>Dogwood <em>Cornus florida</em></td>
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<td>Cardinal</td>
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<td>Sugar Maple <em>Acer saccharum</em></td>
<td>Rhododendron <em>Rhododendron sp.</em></td>
<td>Black bear</td>
<td>Brook trout</td>
<td>Cardinal</td>
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<td>Wisconsin</td>
<td>Sugar Maple <em>Acer saccharum</em></td>
<td>Wood violet <em>Viola sororia</em></td>
<td>Badger</td>
<td>Muskellunge</td>
<td>Robin</td>
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<td>Wyoming</td>
<td>Cottonwood <em>Populus sargentii</em></td>
<td>Indian paint brush <em>Castilleja affinis</em></td>
<td>Buffalo</td>
<td>Cutthroat trout</td>
<td>Western Meadowlark</td>
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### A5: Endangered Species by State

#### Illinois

**Animals**
- **Endangered** Amphipod, Illinois cave (*Gammarus acherondytes*)
- **Endangered** Bat, gray (*Myotis grisescens*)
- **Endangered** Bat, Indiana (*Myotis sodalis*)
- **Endangered** Butterfly, Karner blue (*Lycaeides melissa samuelis*)
- **Endangered** Clubshell Entire Range (*Pleurobema clava*)
- **Endangered** Dragonfly, Hine’s emerald (*Somatochlora hineana*)
- **Endangered** Fanshell (*Cyprogenia stegaria*)
- **Endangered** Higgins’ eye pearlymussel (*Lampsilis higginsii*)
- **Endangered** Pink mucket pearlymussel (*Lampsilis abrupta*)
- **Endangered** Orangefoot pimpleback pearlymussel (*Plithobasus cooperianus*)
- **Endangered** Plover, piping (*Charadrius melodus*)
- **Endangered** Pocketbook, fat (*Potamilus capax*)
- **Endangered** Snail, Iowa Pleistocene (*Discus macclintocki*)
- **Endangered** Sturgeon, pallid (*Scaphirhynchus albus*)
- **Endangered** Tern, least (*Sternula antillarum*)

**Plants**
- **Threatened** Aster, decurrent false (*Boltonia decurrens*)
- **Threatened** Bush-clover, prairie (*Lespedeza leptostachya*)
- **Threatened** Daisy, lakeside (*Hymenoxys herbacea*)
- **Threatened** Milkweed, Mead’s (*Asclepias meadii*)
- **Threatened** Orchid, eastern prairie fringed (*Platanthera leucophaea*)
- **Threatened** Pogonia, small whorled (*Isotria medeoloides*)
- **Threatened** Potato-bean, Price’s (*Apios priceana*)
- **Endangered** Prairie-clover, leafy (*Dalea foliosa*)
- **Threatened** Thistle, Pitcher’s (*Cirsium pitcheri*)

**Fish**
- **Threatened** Banded Killifish (*Fundulus diaphanus*)
- **Endangered** Bigeye shiner (*Notropis boops*)
- **Threatened** Blackchin shiner (*Notropis heterodon*)
- **Endangered** Bluenose shiner (*Notropis welaka*)
- **Endangered** Cypress minnow (*Hybognathus hayi*)
- **Threatened** Gravel chub (*Erimystax x-punctatus*)
- **Endangered** Greater redhorse (*Moxostoma valenciennesi*)
- **Threatened** Iowa darter (*Etheostoma exile*)
- **Endangered** Lake sturgeon (*Acipenser fulvescens*)
- **Threatened** Longnose sucker (*Catostomus catostomus*)
- **Endangered** Pallid shiner (*Hybopsis amnis*)
- **Endangered** Pallid Sturgeon (*Notropis anogenus*)
- **Endangered** Pugnose shiner (*Scaphirhynchus albus*)
- **Threatened** River redhorse (*Moxostoma carinatum*)
- **Threatened** Starhead topminnow (*Fundulus dispar*)
- **Endangered** Sturgeon chub (*Machrybopsis gelida*)
- **Endangered** Weed shiner (*Notropis texanus*)
- **Endangered** Western sand darter (*Ammocrypta clara*)
**Iowa**

**Animals**
- Endangered: Bat, Indiana (*Myotis sodalis*)
- Endangered: Higgins’ eye pearlymussel (*Lampsilis higginsii*)
- Threatened: Plover, piping (*Charadrius melodus*)
- Endangered: Shiner, Topeka (*Notropis topeka*)
- Endangered: Snail, Iowa Pleistocene (*Discus macclintocki*)
- Endangered: Sturgeon, pallid (*Scaphirhynchus albus*)
- Endangered: Tern, least (*Stern a antillarum*)

**Plants**
- Threatened: Bush-clover, prairie (*Lespedeza leptostachya*)
- Threatened: Milkweed, Mead’s (*Asclepias meadii*)
- Threatened: Monkshood, northern wild (*Aconitum noveboracense*)
- Threatened: Orchid, eastern prairie fringed (*Platanthera leucophaea*)
- Threatened: Orchid, western prairie fringed (*Platanthera praeclara*)

**Fish**
- Threatened: American Brook Lamprey (*American Brook Lamprey*)
- Threatened: Bluenose shiner (*Notropis welaka*)
- Threatened: Black redhorse (*Moxostoma duquesni*)
- Endangered: Bluntnose darter (*Etheostoma chlorosoma*)
- Threatened: Burbot (*Lota lota*)
- Threatened: Chestnut lamprey (*Ichthyomyzon castaneus*)
- Endangered: Freckled madtom (*Noturus nocturnus*)
- Threatened: Grass pickerel (*Esox americanus vermiculatus*)
- Endangered: Lake sturgeon (*Acipenser fulvescens*)
- Threatened: Orangethroat darter (*Etheostoma spectabile*)
- Endangered: Pallid Sturgeon (*Scaphirhynchus albus*)
- Endangered: Pearl Dace (*Margariscus margarita*)
- Endangered: Pugnose shiner (*Notropis anogenus*)
- Endangered: Weed shiner (*Notropis texanus*)
- Threatened: Western sand darter (*Ammocrypta clara*)

**Minnesota**

**Animals**
- Endangered: Butterfly, Karner blue (*Lycaeides melissa samuelis*)
- Endangered: Higgins’ eye pearlymussel (*Lampsilis higginsii*)
- Threatened: Lynx, Canada (*Lynx canadensis*)
- Endangered: Mapleleaf, winged Entire (*Quadrula fragosa*)
- Threatened: Plover, piping (*Charadrius melodus*)
- Endangered: Shiner, Topeka (*Notropis topeka*)
- Threatened: Wolf, gray (*Canis lupus*)

**Plants**
- Threatened: Bush-clover, prairie (*Lespedeza leptostachya*)
- Endangered: Lily, Minnesota dwarf trout (*Erythronium propullans*)
- Threatened: Orchid, western prairie fringed (*Platanthera praeclara*)
- Threatened: Roseroot, Leedy’s (*Sedum integrifolium ssp. leedyi*)

**Fish**
- Threatened: Paddlefish (*Polyodon spathula*)
Missouri

**Animals**

- Endangered Bat, gray (*Myotis grisescens*)
- Endangered Bat, Indiana (*Myotis sodalis*)
- Endangered Bat, Ozark big-eared (*Corynorhinus (=Plecotus) townsendii*)
- Endangered Beetle, American burying (*Nicrophorus americanus*)
- Threatened Cavefish, Ozark (*Amblyopsis rosalis*)
- Endangered Cavesnail, Tumbling Creek (*Antrobia culveri*)
- Threatened Darter, Niangua (*Etheostoma nianguae*)
- Endangered Higgins’ eye pearlymussel (*Lampsilis higginsii*)
- Threatened Madtom, Neosho (*Noturus placidus*)
- Endangered Mapleleaf, winged Entire (*Quadrula fragosa*)
- Endangered Pink mucket pearlymussel (*Lampsilis abrupta*)
- Endangered Mussel, scaleskell (*Leptodea leptodon*)
- Endangered Curtis pearlymussel (*Epioblasma floras curtisi*)
- Threatened Plover, piping (*Charadrius melodus*)
- Endangered Pocketbook, fat (*Potamilus capax*)
- Endangered Shiner, Topeka (*Notropis topeka*)
- Endangered Sturgeon, pallid (*Scaphirhynchus albus*)
- Endangered Tern, least (*Sterna antillarum*)

**Plants**

- Threatened Aster, decurrent false (*Boltonia decurrens*)
- Threatened Bladderpod, Missouri (*Lesquerella filiformis*)
- Endangered Clover, running buffalo (*Trifolium stoloniferum*)
- Threatened Milkweed, Mead’s (*Asclepias meadii*)
- Threatened Geocarpon minimum (*No common name*)
- Threatened Orchid, western prairie fringed (*Platanthera praecora*)
- Threatened Pogonia, small whorled (*Isotria medeoloides*)
- Endangered Pondberry (*Lindera melissifolia*)
- Threatened Sneezeweed, Virginia (*Helenium virginicum*)

**Fish**

- Threatened Central mudminnow (*Umbra liii*)
- Endangered Crystal darter (*Crystallaria aspara*)
- Endangered Flathead chub (*Platygobio gracilis*)
- Endangered Lake sturgeon (*Acipenser fulvescens*)
- Endangered Pallid Sturgeon (*Scaphirhynchus albus*)
Wisconsin

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<th>Status</th>
<th>Species</th>
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<td>Butterfly, Karner blue (<em>Lycaeides melissa samuelis</em>)</td>
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<td>Dragonfly, Hine's emerald (<em>Somatochlora hineana</em>)</td>
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<td>Higgins' eye pearlymussel (<em>Lampsilis higginsii</em>)</td>
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<td>Mapleleaf, winged Entire</td>
<td>(<em>Quadrula fragosa</em>)</td>
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<td>Plover, piping</td>
<td>(<em>Charadrius melodus</em>)</td>
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<tr>
<td>Endangered</td>
<td>Wolf, gray (Lower 48 States)</td>
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<td>Milkweed, Mead's</td>
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<td>Monkshood, northern wild</td>
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<td>Orchid, eastern prairie fringed</td>
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<tr>
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<td>Thistle, Pitcher's</td>
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<td>Black redhorse</td>
<td>(<em>Moxostoma duquesni</em>)</td>
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<td>Blue sucker</td>
<td>(<em>Cycleptus elongatus</em>)</td>
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<td>Bluntnose darter</td>
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<td>Crystal darter</td>
<td>(<em>Crystallaria asprella</em>)</td>
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<td>Gravel chub</td>
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<td>Greater redhorse</td>
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<td>Ozark Minnow</td>
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<td>Threatened</td>
<td>Paddlefish</td>
<td>(<em>Polyodon spathula</em>)</td>
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<td>Pugnose shiner</td>
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<td>Redfin shiner</td>
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<td>River redhorse</td>
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<td>Skipjack</td>
<td>(<em>Alosa (Pomolobus) chrysochloris</em>)</td>
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<td>Endangered</td>
<td>Starhead topminnow</td>
<td>(<em>Fundulus dispar</em>)</td>
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<tr>
<td>Endangered</td>
<td>Striped shiner</td>
<td>(<em>Luxilus coccogenis</em>)</td>
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Some species that were once listed as threatened or endangered have recovered enough to be removed from the list, including the bald eagle, peregrine falcon, and brown pelican.
Abiotic means non-living, or never having lived. Non-living chemical and physical components in the environment, such as temperature, light, moisture, or air currents. Examples: rocks, soil, sunlight, water, air, and any items made by humans from non-living components, such as brick and cement.

Abolitionism is the movement to end the slave trade and set slaves free.

Abolitionist is one who worked toward the termination of slavery in the United States.

Adaptation is the biological characteristic that improves the chance of survival of an animal and its descendants.

Anthropology is the study of the origins, physical and cultural development, and the social customs and beliefs of people.

Aquifer is a saturated underground rock layer with enough available water to be pumped out or flow from the ground as a spring.

Archeology, also spelled Archaeology, is the study of past human culture by the recovery and examination of remaining material evidence, such as burial sites, buildings, tools, and pottery.

Atmosphere is the layer of gases that make up the air around Earth. The air includes gases that plants and animals need to breathe.

BCE is known as Before Common Era.

Bacteria are a large group of single-celled organisms that live in soil, water, organic material, and the bodies of living plants and animals.

Belief is feeling sure that something or someone exists or is true.

Biotic means living or having lived. The organic components in an environment that affect organisms. They consist of plant and animal organisms, both living and dead, as well as the results of their activities, including what they eat and defecate.

Biodegradable is something that can be broken down naturally and then becomes part of the soil, water, or air.

Biodiversity is the number and variety of organisms in a given locality, community, or ecosystem.

Biome is a geographical area that shares the same climatic conditions.

Breeding grounds are the areas where an animal mates and produces offspring.

Bridge is a structure built to span a valley, road, body of water, or other physical obstacle, for the purpose of providing passage over the obstacle.

Carbon footprint is the amount of carbon emitted by something during a given period. It relates to the amount of greenhouse gases produced when fossil fuels are burned.

Carnivore is an animal that eat only other animals.

Carrying capacity is the maximum number of healthy individuals within a species that a habitat can sustain.

CE is known as the Common Era.

Channel is the bed where a natural stream of water flows.

Chronology is the organization of events in order of their occurrence.
**Civilization** is similar to culture but commonly used to refer to a more complex or advanced form of organized life, including complex social, political, military, and religious values, goals, and practices.

**Climate** is statistical weather information that describes the variation of weather at a given place for a specified interval. It represents the synthesis of weather; more formally it is the weather of a locality averaged over some period (usually 30 years) plus statistics of weather extremes.

**Climate change** is often used synonymously with the term global warming; it refers to the long-term changes in the climate of a region. A warmer earth may lead to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

**Community** refers to different populations of species that live and interact together. Several communities live together in an ecosystem.

**Confluence** is where two or more bodies of water meet together, usually referring to tributaries.

**Conservation** is the wise use of natural resources in order to ensure continued availability to future generations.

**Consumers** are members of the food chain that eat other living things. There are four types, or tropic levels, of consumers.

**Contaminants** enter the Mississippi River untreated from runoff and stormwater drains. Contaminants may include: pesticides, petroleum, toxic metals, industrial chemicals, nitrate and phosphate.

**Crest** is a high point of an action or process.

**Crustaceans** are a large group of invertebrates that includes shrimp, crabs, and barnacles.

**Culture** is a shared set of attitudes, values, goals, and practices that characterizes an institution, organization or group.

**Current** is a “path” of water or ice that flows in a certain direction.

**Decomposers** are living things that break down the cells of dead plants and animals into simpler parts, helping to return nutrients to the soil to be used by the primary producers. Decomposers can include fungi (mold), bacteria, and worms.

**Detritus** are small pieces of organic material from dead and decaying plants and animals.

**Drainage basin**, also called a watershed, is a region or area of land where water from rain or snow drains downhill into a body of water, such as a river, lake, wetland, estuary, sea, or ocean.

**Drainage divide**, water divide, divide, or watershed is the line separating neighboring drainage basins (catchments).

**Ecological footprint (eco-foot print)** is the negative impact that something has on the environment.

**Ecosystems** are groups of living and nonliving things interacting with and dependent on each other to create a stable, self-sustaining system. They can be as small as a puddle or as large as the Earth itself.

**Endangered** refers to a plant or animal species that is in immediate danger of becoming extinct and needs protection to survive.

**Erosion** occurs when rock or soil is loosened and carried off by glaciers, rivers, winds, and waves.

**Estuary** is a partly enclosed coastal body of water with one or more rivers or streams flowing into it, and with a free connection to the open sea. The mix of freshwater and marine environments creates very productive habitats.
**Evaporation** is the releasing of water back into the atmosphere when it changes from a liquid to water vapor.

**Extinct** refers to a plant or animal species that is no longer living on earth.

**Firn** is a snowflake that has lost half of its air and did not completely melt during its first summer. Firn comes from German meaning “of last year.”

**Flyway** is a general flight route used by many migrating bird species between their wintering grounds and their breeding grounds. There are four major migratory flyways in North America: Atlantic, Mississippi, Central, and Pacific Flyways.

**Floodplain** is flat or nearly flat land next to a stream or river that occasionally or periodically floods.

**Flood stage** is the established gage height for a given location above which a rise in water surface level begins to create a hazard to lives, property, or commerce.

**Food chain** is the relationships among organisms in a habitat arranged in order of predation (interactions between predators and prey).

**Food web** is all the food chains in a particular habitat.

**Free negro** is a person born to a free African-American woman (the rights of the child were determined by the rights of the mother); rights restricted by laws intended for slaves.

**Free states** are states that had prohibited the institution of slavery (as of 1836): Indiana, Illinois, Michigan, Ohio, Pennsylvania, Rhode Island, Connecticut, New Jersey, New York, Massachusetts, New Hampshire, Vermont, Maine.

**Freed slave** is a free African-American who has purchased freedom or was freed by his or her owner.

**Fugitive slave** is one who flees; a runaway.

**Geopolitical boundaries** are the political and geographic factors that influence boundaries. Drainage basins have been historically important for determining territorial boundaries, particularly in regions where trade by water has been important.

**Glacier** is a huge collection of ice that moves slowly across the land. Glaciers form when more snow accumulates than melts. Glacier comes from the Latin word glacies meaning ice.

**Global warming** is the average increase in the Earth's temperature, which causes changes in climate.

**Gravity** is a force. Every time you jump, you experience gravity. It pulls you back down to the ground. Without gravity, you'd float off into the atmosphere.

**Greenhouse gases** are gases that trap heat in the atmosphere, much like a greenhouse. Greenhouse gases include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), halogenated fluorocarbons (HCFCs), ozone (O3), and hydrofluorocarbons (HFCs).

**Groundwater** is water located beneath the ground surface.

**Habitat** is the place where an animal makes its home and meets all of its needs for survival, including food, water, shelter, and space.

**Headwaters** or source of a river or stream is the place from which the water in the river or stream begins.

**Herbivore** is an animal that eat only plants.

**Historic** is the term used to describe the period of time known about through records, such as written or oral traditions.

**Humidity** is the amount of water vapor (moisture) in the air.
**Igneous rocks** form when magma solidifies. Magma is molten rock from deep within the Earth. The chemical composition of the magma and its cooling rate determine the final igneous rock type.

**Indicator species** is a species whose presence, absence, or relative well-being in a given environment tells us about the health of its ecosystem as a whole. Also called bioindicators.

**Invertebrates** are animals without backbones, which includes about 95% of all animal species, such as insects, worms, spiders, crustaceans, and mollusks.

**Language** is a form of communication. Without language, people could not learn from one another across generations and culture could not be transmitted.

**Magma** is deep within the Earth. It is so hot that some rocks slowly melt and become a thick flowing substance. Some of the magma pushes through vents and fissures in the Earth’s surface until a volcanic eruption occurs. Magma that has erupted is called lava.

**Metamorphic rocks** are rocks that have been substantially changed from their original igneous, sedimentary, or earlier metamorphic form.

**Migration** is the movement of a species from one place to another, often following a change of season. Migration of people to new areas is usually an attempt to find new opportunities or resources.

**Migration route** is the path taken during the course of migration by a single bird species. There are four major migratory routes in North America: Atlantic, Mississippi, Central, and Pacific Flyways.

**Mollusks** are a large group of invertebrates that includes snails, slugs, clams, and mussels.

**Niche** is the functional role a particular organism plays in an ecosystem. If two species occupy the same niche then competition occurs until one has replaced the other.

**Non-renewable resources** are non-living resources that do not regenerate themselves.

**Ocean** is a major body of salt water. About 71% of the Earth’s surface is covered by ocean, a continuous body of water that is customarily divided into several principal oceans and smaller seas.

**Ojibwe** is a group of Native American people from along the Mississippi River and the Great Lakes. Also spelled Ojibwey and Ojibwa. The name is sometimes anglicized as Chippewa.

**Omnivore** is an animal that eat both plants and other animals.

**Organism** is an individual living thing, such as a plant, animal, fungus, and bacteria.

**Photosynthesis** is the process through which green plants make their own food from sunlight, water, and a gas called carbon dioxide.

**Phytoplankton** are microscopic plants that live in or near the surface of the water.

**Plankton** are microscopic organisms that live in both salt and fresh water.

**Pollution** is the contamination of air, water, or soil by substances that are harmful to living organisms, usually caused by human activities.

**Population** is a group of the same species living in the same place at the same time.

**Precipitation** in general is the name for freshwater that falls from clouds as rain, hail, snow, or dew.

**Predator** is an animal that kills and eat other animals.
Prehistoric is a term used to describe the period before recorded history.

Prey are animals that are killed and eaten by other animals.

Producers are organisms, such as plants and algae, that make their own food through photosynthesis.

Recycling is reusing or making a substance available for reuse. For example, when organisms die or produce waste, they become food for decomposers, which break down the organic matter into nutrients that can be used again by producers.

Reservoir is an artificial lake used to store water. Reservoirs are often created by building a reinforced dam.

Riparian habitat is the habitat along the bank of a river.

River mouth is where a river empties into an ocean or other large body of water.

Safe house is a place that provides safe haven for people. Safe houses were part of the Underground Railroad. Their locations were kept secret from all but a limited number of people.

Scavengers are animals that eat dead things.

Sea generally refers to a large body of salt water and is commonly used as a synonym for ocean.

Sediment is the matter that settles to the bottom of a liquid, usually sand, rock, or gravel. Sediment refers to a collection of solid material that gets dragged along with the flow of the river water, and then settles to the riverbed when the flow slows down.

Sedimentary rocks are formed from pieces of pre-existing rocks worn away from weathering and erosion of once-living organisms. Called sediment, these small pieces may be transported and deposited elsewhere by rivers.

Shared resource means sharing an entity by many. At school, you share the playground with other students. The playground is a shared resource.

Settler is a person who has migrated to an area and established residence there.

Settlement is a permanent or temporary community in which people live.

Slavery is a system in which people are the property of others and can be bought and sold.

Slave states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Tennessee, Texas, Virginia, West Virginia, Delaware, Maryland. Slavery was also legal in the District of Columbia.

Social organization is a set of complex systems and institutions developed to meet basic needs, such as family, governments, languages, universities, hospitals, business corporations, and legal systems.

Species is a single kind of living thing. All people are one species. Two organisms of the same species can reproduce.

Spirituals are religious songs which were created by African American slaves. Some believe they were coded with information to help slaves escape.

Stopovers are places where birds stay for a brief time during their migration.

Strata are distinct layers of sediment compressed over time. For example, sand eventually becomes sandstone because of pressure and cementing agents.

Stream flow refers to the amount of water that moves through streams, rivers, and other water channels.

Sustainable means meeting the needs of the present without exceeding the needs of the future.
Threatened means an organism whose population is declining in numbers, but has not yet become endangered. A plant or animal species that is likely to become endangered if it is not protected.

Timeline is a visual representation of the events of a certain era, used as a tool for studying history and culture.

Topography is the study of the shape of physical features of the Earth, such as mountains, valleys, plains, peninsulas, cliffs, rivers, and lakes.

Trade is the voluntary exchange of goods, services, or both. Trade is also called commerce. The original form of trade was barter, the direct exchange of goods and services without using money.

Tradition is the practice of handing down information, beliefs, or customs from one generation to another.

Transportation is the movement of people and goods from one location to another.

Tributary is a stream or river which flows into a main stem river. A tributary does not flow directly into a sea, ocean, or lake. Tributaries and the main stem river serve to drain the surrounding drainage basin of its surface water and groundwater by leading the water out into an ocean or some other large body of water.

Trophic level is the position of an organism in a food chain.

Underground Railroad was an informal network of secret routes and safe houses used by 19th-century African American slaves in the U.S. to escape to free states and Canada with the aid of abolitionists who were sympathetic to their cause.

Value is the idea that something, such as an object, goal, or belief, is valuable or desirable.

Volcano refers to an opening or vent through which the molten rock and associated gases are expelled.

Water cycle is the continuous movement of water on, above, and below the surface of the Earth. Water can change states among liquid, vapor, and ice at various places in the water cycle. Also called the hydrologic cycle.

Watercraft is a vehicle, vessel or craft designed to move across (or through) water, including saltwater and freshwater, for pleasure, recreation, physical exercise, commerce, transport, and military missions.

Watershed is a region or area of land where water from rain or snow drains downhill into body of water, such as a river, lake, wetland, estuary, sea, or ocean. Also called a drainage basin.

Weather is the day-to-day state of the atmosphere, and its short-term (minutes to weeks) variation. Popularly, weather is thought of as the combination of temperature, humidity, precipitation, cloudiness, visibility, and wind.

Wetland is an area of land whose soil is saturated with moisture either permanently or seasonally. Such areas may also be covered partially or completely by shallow pools of water.

Zooplankton are microscopic animals that eat other plankton, such as phytoplankton.
## A7: Education Standards

The planning chart in Appendix 8 shows which activities and lessons are associated with which standard.

<table>
<thead>
<tr>
<th>NATIONAL STANDARDS</th>
<th>ILLINOIS</th>
<th>IOWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Committee on Science Education Standards and Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Science as inquiry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Physical science</td>
<td></td>
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<tr>
<td>• Life science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Earth science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Science and technology</td>
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<td></td>
</tr>
<tr>
<td>• Science in personal and social perspectives</td>
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<td></td>
</tr>
<tr>
<td>• History and nature of science</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Science

- **Science (Grades K-12)**
  - Inquiry and design
  - Concepts and principles
  - Science, technology and society

### Math

- **Math Standards (Grades 6–8)**
  - Numbers and operations
  - Algebra
  - Geometry
  - Measurement
  - Data analysis and probability
  - Problem solving

- **Math Standards (Grades K-12)**
  - Applications of learning
  - Solving problems
  - Communicating
  - Using technology
  - Working on teams
  - Making connections

### Social Science

- **Social Science Standards (Grades K-12)**
  - Civics
  - Economics
  - Geography
  - History

- **Social Studies (Grades K-12)**
  - Political systems
  - Economics
  - History
  - Geography
  - Social systems

- **Social Studies (Grades 5-6)**
  - Political science and civic literacy
  - Behavioral science
  - Economics
  - Geography
  - History
### A7: Education Standards

<table>
<thead>
<tr>
<th>MINNESOTA</th>
<th>MISSOURI</th>
<th>WISCONSIN</th>
</tr>
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<tbody>
<tr>
<td><a href="http://education.state.mn.us/mde/Academic_Excellence/Academic_Standards/index.html">http://education.state.mn.us/mde/Academic_Excellence/Academic_Standards/index.html</a></td>
<td><a href="http://dese.mo.gov/standards/content.html">http://dese.mo.gov/standards/content.html</a></td>
<td><a href="http://dpi.wi.gov/standards/applying.html">http://dpi.wi.gov/standards/applying.html</a></td>
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<td><strong>Science</strong> <em>(Grades K-12)</em></td>
<td><strong>Science</strong> <em>(Grades 5-6)</em></td>
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<tr>
<td>- The nature of science and engineering</td>
<td>- Physical science</td>
<td>- Clarity and specificity</td>
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<td>- Physical science</td>
<td>- Earth science</td>
<td>- Advanced science content</td>
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<td>- Earth and space science</td>
<td>- Scientific inquiry</td>
<td>- Examples of science in Wisconsin</td>
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<tr>
<td>- Life science</td>
<td>- Impact of science, technology and human activity on resources and the environment</td>
<td>- Connectedness</td>
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<tr>
<td><em>(Grade 6)</em></td>
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<td>- Safety</td>
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<tr>
<td>- The nature of science and engineering</td>
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<tr>
<td>- Physical science</td>
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<td></td>
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<td><strong>Math</strong> <em>(Grades K-12)</em></td>
<td><strong>Math</strong> <em>(Grades 5-6)</em></td>
</tr>
<tr>
<td>- Number and operation</td>
<td>- Numbers and operations</td>
<td>- Connections</td>
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<tr>
<td>- Algebra</td>
<td>- Geometric and trigonometry</td>
<td>- Problem solving</td>
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<tr>
<td>- Geometry and measurement</td>
<td>- Data analysis, probability and statistics</td>
<td>- Reasoning</td>
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<td>- Data analysis</td>
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<td>- Communication</td>
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<td></td>
<td>- Discrete mathematics</td>
<td>- Technology</td>
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<td><strong>Social Studies</strong> <em>(Grades K-12)</em></td>
<td><strong>Social Studies</strong> <em>(Grades 5-6)</em></td>
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<tr>
<td>- Government and citizenship</td>
<td>- Civics</td>
<td>- Definition of social studies</td>
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<tr>
<td>- Economics</td>
<td>- History of Missouri, the United States, and the world</td>
<td>- Knowledge and skills</td>
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<td>- Geography</td>
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<td>- United States history</td>
<td>- Economic concepts and principles</td>
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<td>- Minnesota history</td>
<td>- Geography</td>
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<tr>
<td>- World history</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Historical skills</td>
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### NATIONAL STANDARDS

<table>
<thead>
<tr>
<th>Fine Arts</th>
<th>ILLINOIS</th>
<th>IOWA</th>
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<tbody>
<tr>
<td><strong>Fine Arts Standards</strong> <em>(Grades 5–8)</em></td>
<td><strong>Fine Arts</strong> <em>(Grades K–12)</em></td>
<td><strong>Fine Arts</strong> <em>(Grades 5–6)</em></td>
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</table>
| Consortium of National Arts Education Associations | • Language of the arts  
• Creating and performing  
• Arts and civilization | NA |
| • Visual media  
• Music  
• Drama  
• Dance | |

<table>
<thead>
<tr>
<th>Language Arts</th>
<th>Language Arts</th>
<th>Literacy</th>
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<td><strong>Literacy</strong> <em>(Grades 5–6)</em></td>
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</tbody>
</table>
| National Council of Teachers of English | • Reading  
• Literature  
• Writing  
• Listening and speaking  
• Research | • Reading  
• Writing  
• Speaking  
• Listening  
• Viewing essential concepts and skills |
| • Reading for perspective  
• Understanding the human experience  
• Evaluation strategies  
• Communication skills  
• Communication strategies  
• Applying knowledge  
• Evaluating data  
• Developing research skills  
• Multicultural understanding  
• Participating in society  
• Applying language skills | |
| | | |
### MINNESOTA

**The Arts**  
*Grades 5-6*
- Dance
- Music
- Theater
- Visual arts

### MISSOURI

**Visual and Performed Arts**  
*Grades K-12*
- The principles and elements of different art forms
- Interrelationships of visual and performing arts and the relationships of the arts to other disciplines
- Historical and cultural contexts

### WISCONSIN

**Fine Arts**  
*Grades 5-6*
- NA

---

### MINNESOTA

**Language Arts**  
*Grade 5*
- Reading and literature
- Writing
- Speaking, listening and viewing

*Grade 6*
- Reading and literature
- Writing
- Speaking, listening and viewing

### MISSOURI

**Communication Arts**  
*Grades K-12*
- Speaking and writing standard English
- Reading and evaluating
- Reading and evaluating nonfiction works and material
- Writing formally and informally
- Formal and informal presentations and discussions of issues and ideas

### WISCONSIN

**Language Arts**  
*Grades 5-6*
- Language arts: A developmental subject
- Great authors and literary works
- Connectedness
A8: Planning Chart

Our Mississippi: Educational Activities about the Upper Mississippi River

Unit 1 Goal:
Introduce students to the Mississippi River Watershed and explore how it made its mark on the country's ecosystems and commerce.

A8: Planning Chart

1a. On the map:

- Mississippi River
- Watershed
- Upper Mississippi River Watershed
- Waterway
- Tributaries
- Major Cities

1b. Do an experiment:

- Sediment bottle
- Glacial erosion

1c. Do an assessment:

- Pre-assessment
- Vocabulary
- Mississippi River

1.0 Introduction to the Mississippi River Watershed

1.1 Movers and Scrapers: Upper Mississippi Glaciations

1.2 Built from the Bottom Up: Sediment Strata

1.3 Going with the Flow: Ups and Downs of the Water Cycle

1.4 One Trunk with Many Branches: Mapping the Mississippi River Watershed

Page 6

- Geography
- Earth Science
- Language Arts

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- Science
- Language Arts

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- Science
- Language Arts

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- Science
- Language Arts

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- Math
- Science
- Language Arts
## Unit 2 Goal:
Explore the ecosystems of the Mississippi River and how humans affect them

### 2.1 At Home in the River: Plants, Animals, and Habitats of the Upper Mississippi River
- **Define** terms related to ecosystems of the Upper Mississippi River
- Study the ecosystems of Upper Mississippi River
- Investigate biotic and abiotic components outside

### 2.2 Just Passing Through: Bird Migration and the Mississippi River Flyway
- **Define** terms related to ecosystems of the Upper Mississippi River
- Research migration routes and identify stopovers
- Create a flyway in your classroom
- Prepare for a birdwatching field trip

### 2.3 Well River Check-up: Assessing the Health of the River
- Understand point and non-point pollution
- Examine the effects of detergents and fertilizers on aquatic life
- Test for dissolved oxygen in water samples
- Determine the relationship between pollutants and dissolved oxygen

### 2.4 Life on the Brink: Endangered Species of the Upper Mississippi River
- Define terms related to ecosystems of the Upper Mississippi River
- Identify endangered species in your local area
- Design and plant a wildlife garden

### 2.5 Mississippi River Sustainability: How to Make a Positive Impact on Your Environment
- Discuss how we can help endangered species that depend on the Upper Mississippi River
- Design and plant a wildlife garden
- Identify conservation ideas for school and home

### Science as Inquiry
- Life Science
- Science in Personal and Social Perspectives

### Life Science
- Science in Personal and Social Perspectives

### Geology
- Physical Science
- Life Science
- Science in Personal and Social Perspectives

### Fine Arts
- Language Arts
- Music

### Language Arts
- Literature
- Writing

### History
- Social Studies
- Geography

### Social Studies
- Geography
- Social Studies

### Reading
- Reading
- Comprehension

### Writing
- Writing
- Literature

### Team Project
- Collaborative Learning
- Group Work

### Field Trip
- Field Studies
- Nature Tours

### Science Fair
- Science Projects
- Experiments

### Math
- Calculations
- Graphs

### Environmental Science
- Environmental Impact
- Conservation

### Ethics
- Ethical Issues
- Responsibility

### Art
- Visual Arts
- Music

### Music
- Musical Composition
- Performance

### Language Arts
- Reading Comprehension
- Writing

### Social Studies
- History
- Geography

### Geography
- Physical Science
- Geography

### Physical Science
- Physical Science
- Life Science

### Science in Personal and Social Perspectives
- Social Studies
- Geography

### Social Studies
- Social Studies
- Geography
Unit 3 Goal:
Learn how communities and cultures develop and evolve to form civilizations.

3.0 Introduction to Mississippi River History and Culture
Understand our own traditions and culture
- Discover your family culture
- Identify your family traditions
- Investigate how technology influences or changes traditions

3.1 Mississippi River's Ancient Civilizations
Learn about ancient Americans living along the Mississippi
- Explore early American civilizations
- Discover their customs and cultures
- Compare their cultures to yours

3.2 Where Worlds Meet: Early European Exploration
Learn how new European settlements started along the Mississippi River
- Identify explorers of the Mississippi River and their sponsoring countries
- Discuss why many countries wanted to claim the Mississippi River
- Explain the importance of the Louisiana Purchase

3.3 Louisiana Purchase: Gateway to the Western Frontier
Understand the Mississippi River's role in the Louisiana Purchase
- Review the importance of the Louisiana Purchase
- Discuss the significance of Zebulon Pike's expedition on the Mississippi River
- Compare and contrast the Lewis and Clark and the Zebulon Pike expeditions

3.4 Rivers of Human Migration: Settlement, Transportation, and Trade
Learn why people migrate and the river's role in migration
- Explore reasons for human migration
- Research your state
- Identify geographic characteristics that influence migration and settlement

3.5 Mississippi River: Pathway to Freedom
Learn the role of the Mississippi River in the Underground Railroad
- Discover key people in the Underground Railroad
- Learn the role of the Underground Railroad
- Discover and contrast the Lewis and Clark and the Zebulon Pike expeditions
- Compare and contrast the Lewis and Clark and the Zebulon Pike expeditions

A8: Planning Chart
Our Mississippi: Educational Activities about the Upper Mississippi River
### Unit 4 Goal: Explore the Mississippi River at work and how it has changed over time

#### 4.0 Introduction to the Mississippi River at Work
- Research river-related occupations on the Mississippi River
- Identify the river's role in these occupations
- Discuss the river's impact on wildlife

#### 4.1 Early Navigation: Powered by People
- Explore what river navigation was like before the Age of Steam
- Compare watercrafts used before steamboats
- Understanding how early watercrafts were navigated
- Build a flatboat

#### 4.2 All Aboard the Steamboat Era: Steam Powers a New Economy
- Learn how the steamboat changed travel and commerce on the river
- Introduce the steamboat
- Discuss how the steamboat revolutionized river commerce
- Use maps to navigate the river
- Demonstrate the power of steam

#### 4.3 River Running Dry, River Running High: Major Floods on the Upper Mississippi River
- Understand the natural cycles of flooding and drought on the Upper Mississippi River
- Compare how floods and droughts affected the river
- Use maps to navigate the river
- Research what kind of technology was used after each major flood
- Produce a news article and broadcast

#### 4.4 Controlling the River: Locks and Dams on the Upper Mississippi River
- Learn how locks and dams make it possible to navigate the Upper Mississippi River
- Explore how locks and dams changed the river
- Discuss the impact on wildlife
- Watch how a lock works

#### 4.5 To Market! To Market!: Our Inland Waterway System
- Understand the river's role as a vital economic Interstate
- Research which products go up the river and which ones down
- Compare modes of transportation via river, rail, and road
- Create a virtual trip from the Atlantic Ocean through the St. Lawrence Seaway to the Gulf of Mexico
- Read a navigational chart

#### A8: Planning Chart

<table>
<thead>
<tr>
<th>Activity</th>
<th>Social Sciences</th>
<th>Fine Arts</th>
<th>Language Arts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-assessment</td>
<td>Research river-related occupations</td>
<td>Read a navigational chart</td>
<td>Write an occupation of your choosing</td>
</tr>
<tr>
<td>Explore the river's role in these occupations</td>
<td>Create steam power</td>
<td>Produce news broadcast</td>
<td>Make the Twain</td>
</tr>
<tr>
<td>Discuss the river's impact on wildlife</td>
<td>Discuss the impact on wildlife</td>
<td>Produce news article and broadcast</td>
<td>Make a flatboat</td>
</tr>
<tr>
<td>Build a flatboat</td>
<td>Use maps to navigate the river</td>
<td>Demonstrate the power of steam</td>
<td>Make a flatboat</td>
</tr>
<tr>
<td>Discuss how the steamboat revolutionized river commerce</td>
<td>Introduce the steamboat</td>
<td>Discuss how the steamboat changed travel and commerce on the river</td>
<td>Create steam power</td>
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<tr>
<td>Compare watercrafts used before steamboats</td>
<td>Compare watercrafts used before steamboats</td>
<td>Compare watercrafts used before steamboats</td>
<td>Build a flatboat</td>
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<tr>
<td>Understanding how early watercrafts were navigated</td>
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<td>Identify the river's role in these occupations</td>
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**Unit 5 Goal:**

Explore what it means to safely share the Upper Mississippi River

### Planning Chart

**Our Mississippi:**

#### Educational Activities about the Upper Mississippi River

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