

2013 Mississippi River Institute Agenda

Course Goals	<ul style="list-style-type: none"> ▪ To explore how using rivers as a context can help your students meet specific MN education standards in science and language arts among other curricular areas ▪ To model inquiry-based science and engineering investigations in a watershed context
Course Objectives	<ul style="list-style-type: none"> ▪ Understand the science, engineering and literacy opportunities represented by the river ▪ Practice specific skills of science literacy ▪ Learn social science and natural science content relevant to the river ▪ Investigate strategies for teaching literacy skills through science content ▪ Engage in critical thinking that connects the content and practice of science, engineering, and literacy skills into an interdisciplinary system of thinking
Structure of Institute	<ul style="list-style-type: none"> ▪ Practice the skills of observation and visual note taking ▪ Practice the skills of scientific inquiry to investigate aquatic and terrestrial ecosystems and the surrounding geology ▪ Share strategies for helping students ‘think like scientists’ as they practice the skills of literacy ▪ Explore engineering challenges and practice the engineering design process ▪ Participate in learning activities from Project WET ▪ Participate in learning activities from Waters to the Sea ▪ Create plans to implement science, inquiry and literacy investigations in their classrooms
Connecting Science and Literacy	<ul style="list-style-type: none"> ▪ Scientists gather and use data to support their thinking ▪ Writers use experience and choices to shape a text ▪ Students must learn to write like a reader and read like a writer ▪ Data that comes from direct experience fosters ownership and motivates the writer to write towards meaning ▪ Authentic science experiences motivate students to read for information ▪ Note-taking moves experience into long-term memory ▪ The use of revising a text helps a writer clarify meaning ▪ Scientists keep notebooks containing their questions, procedures, data, and thoughts, written over the duration of an investigation. ▪ Scientific writing reflects a students’ synthesis of understanding of the concepts and the process of their science inquiry. ▪ Talking and writing are both fundamental to learning in both science and literacy

Monday, July 24

Crosby Farms Regional Park

Main Focus	Activity	Science Literacy Connection	Waters to the Sea Program Element	Project WET Activity Connection
Rivers and watersheds are complex systems that can be observed, measured and understood	<ul style="list-style-type: none"> ▪ Introduction of Instructors ▪ Brief overview of Institute ▪ Observation Activity ▪ Science Notebook Introduction (Organization, science literacy, graphic organizers - +-Know-Observe-Wonder-Learned-Questions for Later) ▪ River Exploration and Observation (observations, sketches, vocabulary in context, thoughts of curriculum connections) ▪ Debrief Observation Experience with ‘Snapshot’ activity ▪ Observation versus Inference (poem) ▪ Going from Observations to Questions (Q-Matrix) 	<p>Vocabulary in context (Participants will jot down new vocab from naturalists during canoeing exploration)</p> <p>Record of Thinking (Science notebooks are an ongoing record of student thinking and scientific inquiry process.)</p>	<p>Understanding Watersheds: Mississippi Watersheds</p> <p>Journey Down Minnehaha Creek: Native Life: Changing Climates and Habitats</p> <p>What is an Ecosystem? Energy Pyramid</p> <p>Understanding Watersheds: Major US Watersheds</p>	River Talk
Share discoveries of observations	Lunch Conversations	Talk (Student/Participants talk is fundamental to literacy learning. Talk is a rehearsal for writing. Talk allows ideas to be considered, challenged and revised. Talk promotes cognitive development.)		
Water moves through the biosphere in a variety of ways	<ul style="list-style-type: none"> ▪ Forest Inquiry (Directed Inquiry) <i>Sil, Ed, Teri, David</i> ▪ Return to boat for journey back ▪ Debrief from Day ▪ Evaluation/Reflection ▪ Give writing assignment ▪ Sum of the Parts Homework (<i>due Wednesday morning</i>) 	<p>Science argumentation (Participants will analyze the development plans of fellow participants and will include evidence for each of the statements made about the analyzed plans.)</p> <p>Reflection (Participants write a paragraph that informs reader about their experience and thoughts on what the previous day’s experience meant to them.)</p>	<p>Explore the Mississippi Headwaters: Early Logging: Lumberjacks and Timber Barons, Forest Ecology Video</p> <p>What is an Ecosystem? Forest Food Web</p> <p>Journey Down Minnehaha Creek: Introducing the Watershed, Big Woods QTVR Panorama</p>	<p>Just Passing Through</p> <p>Sum of the Parts</p>

Tuesday, July 30
Fort Snelling State Park

Main Focus	Activity	Science Literacy Connection	Waters to the Sea Activity/Connection	Project WET Activity/Connection
Organisms develop features that allow them to live in specific sets of ecological conditions	<ul style="list-style-type: none"> ▪ Check in from Monday ▪ Share reflections ▪ Discuss science literacy ▪ Brief overview of course assignments/syllabus review ▪ Waters to the Sea Introduction ▪ How WTTS connects with RI ▪ Macroinvertebrate Inquiry (Guided Inquiry) <i>Cara, David, Janine, and Chris</i> ▪ Geology Inquiry (Guided Inquiry) <i>Ed, Sil, John and Lee</i> 	<p>Reflection (Participants will write a paragraph that informs reader about their experience and thoughts on what the previous day’s experience meant to them.)</p> <p>Recording observations – What do you see?</p> <p>Vocabulary – How can you describe what you see?</p> <p>Data charts – How will you organize what you see?</p> <p>Note taking – What processes did you use, what interactions are you having with colleagues, what important points do you want to remember?</p> <p>Presentation of findings – What evidence supports the findings of your study?</p> <p>Evidence-based discussions – What evidence supports the findings of your study?</p>	<p>Explore the Mississippi Headwaters: Trouble in Paradise? Recreation and Tourism, Fish Habitat Activity</p> <p>What is an Ecosystem? Energy Pyramid</p> <p>Testing for Water Quality: Water Lab Tutorial</p>	<p>Blue River</p> <p>Macroinvertebrate Mayhem</p>
Discussion of Place-Based Education	<p>Lunch</p> <p><i>*Those taking for Grad Credit, meet to discuss course requirements.</i></p>	<p>Talk (Student/Participants talk is fundamental to literacy learning. Talk is a rehearsal for writing. Talk allows ideas to be considered, challenged and revised. Talk promotes cognitive development.)</p>		
Science is a way of knowing the world that is based in evidence, argumentation, imagination and reason	<ul style="list-style-type: none"> ▪ Debrief Inquiry Process ▪ Macroinvertebrate Inquiry (Open Inquiry) ▪ Geology Inquiry (Open Inquiry) ▪ Illuminate and Discuss science notebooks ▪ Discussion of teaching outdoors ▪ Debrief from day ▪ Evaluation/Reflection ▪ Give writing assignment 	<p>Recording observations – What do you see?</p> <p>Vocabulary – How can you describe what you see?</p> <p>Data charts – How will you organize what you see?</p> <p>Note taking – What processes did you use, what interactions are you having with colleagues, what important points do you want to remember?</p> <p>Presentation of findings – What evidence supports the findings of your study?</p> <p>Evidence-based discussions – What evidence supports the findings of your study?</p> <p>Personal narrative (Participants will read their reflection from previous day. Using data collected, they will rewrite their reflection from the day before, drafting it as a personal narrative. The text should help readers understand what it felt like to be on the river.)</p>	<p>See Morning Notes</p>	<p>Macroinvertebrate Mayhem</p>

Wednesday, July 31

Fort Snelling State Park

Main Focus	Activity	Science Literacy Connection	Waters to the Sea Activity/Connection	Project WET Activity/Connection
<p>Landscapes are shaped by a variety of forces and processes, both natural and manmade. Land use has an impact on water quality.</p> <p>Integrating engineering design into environmental activities that meet state standards</p>	<ul style="list-style-type: none"> ▪ Check in from Tuesday ▪ Share narratives ▪ Inquiry Cubes ▪ Waters to the Sea Exploration ▪ Engineering Activities and Debrief 	<p>Technical writing/Factual genre/recording processes (As participants design engineering solutions, keep careful notes on what your team does at each step.)</p> <p>Writing Instructions (When participants have finished their prototypes, they will write a set of instructions that give specific information to guide another team in recreating their design.)</p>		
<p>Discussion of Integration – How? Why? Challenges.</p>	<p>Lunch</p>	<p>Talk (Student/Participants talk is fundamental to literacy learning. Talk is a rehearsal for writing. Talk allows ideas to be considered, challenged and revised. Talk promotes cognitive development.)</p>		
	<ul style="list-style-type: none"> ▪ Sum of the Parts Wrap up ▪ Project WET Wrap Up ▪ Content Conversations ▪ More engineering, geology stroll, tree talk (forest survey), invasive species, science notebooks, history of park, MDE Standards ▪ Debrief from day ▪ Debrief Institute ▪ Evaluations/Reflections 	<p>Analyzing data for patterns</p> <p>Evidence-based discussions</p>		