

Acknowledgement

We would like to thank the many educators who give countless to the education of children, especially the ones who have helped make this curriculum a reality. Thank you for the effort you all have given.

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SOUTHERN UNIVERSITY EDUCATIONAL AND INTERPRETIVE FOREST

WATERSHEDS, WETLANDS, AND WILDLIFE



A LIVING LABORATORY

2013-2014

We know students are expected to learn specific topics that many times seem irrelevant in a brick and mortar classroom, but what if learning took place by them putting their hands on it so it makes a lasting expression. Visit Southern University Education and Interpretive Forest with your class to experience an understanding of our watersheds, wildlife, and natural ecology in Louisiana

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INTRODUCTION

PURPOSE

The Southern University Campus is a unique place. Situated on Historical Scott's Bluff overlooking the Mighty Mississippi River, the campus offers picturesque views and a quality education. One can sit atop the Bluff and look out onto the Mississippi River and watch the nation's largest river and watershed at work. With a constant flow of vessels, barges and boats, the Mississippi River is a choice path for transportation of many of the commodities and goods that Americans consume on a daily basis. The Mississippi River watershed drains out country's melting ice and rainfall, and deposits that nutrient rich water into the Gulf of Mexico.

The constant twists, bends and meanders of the Mississippi River allow for the river's water to be unique in size and volume of water carried from North to South. The river also has an underwater profile that allows for transportation, but also provides habitat to many species of fishes and aquatic life. The cut-bank of the river is the deepest section of the river, and traditionally is the fastest moving water, and can also be some of the coldest water in the river. The slack-bank, or the shallows, are the area of river where the sand or fine sediments get deposited. These areas tend to be shallow, and warmer, with slower moving waters. The slack-bank/shallows area the "nursery" of the Mississippi River. Unfortunately, because the Mississippi River watershed is so vast, it is highly susceptible to impacts for humans. The water in the river gets used by industries, municipalities, and recreational users. Environmental regulations such as the Clean Water Act are aimed at the protection of the river and its valuable attributes.

Additionally, the batture and the alluvial floodplains associated with the Mississippi River provide a habitat structure that is unique and many species of plants and wildlife call this area home. These areas get flooded periodically, and the rich sediment of the Mississippi River get deposited in these areas. This periodic flooding allows for nutrients and rich, fertile soils to be layered in these areas.

The Mississippi River provides for a great backdrop for establishing an outdoor classroom. The Southern University Educational and Interpretive Forest utilizes the Mississippi River as a backdrop for our outdoor classroom. We welcome you to our outdoor classroom. Field Trip Forms can be found in *Appendix A*.

APPROACH

We have chosen to use a constructivist approach in most of our lesson plans and activities. Constructivist teaching is based on the constructivist learning theory. This is the belief that learning occurs as learners are actively involved in a process of meaning and knowledge construction as opposed to passively receiving information. Learners are considered the makers of meaning and knowledge. This type of teaching fosters critical thinking, and critical thinkers

in turn lead to independent learners. Each lesson will have a “five E approach”-Engage, Explore, Explain, Elaborate, and Evaluate. Actively engaging students in the process is the key to lifelong learning.

CURRICULUM

The curriculum is not designed stand-alone. It was built specifically with the sole purpose of bringing students to Southern University’s campus to receive a hands-on experience of the ecology and biology of East Baton Rouge Parish. Teachers are invited to fill in the gaps designed into the program with content that relates specifically to the needs of their students. The curriculum’s purpose is to help the student and teacher receive a better understanding of science and social studies concepts, while integrating reading, writing, and math. Students will track their field assignments and activities and completed assignments in their Learning Journal, *Appendix B*.

SOUTHERN UNIVERSITY DOCENT LEADERS

This outdoor learning experience has been designed to bring in young students, teachers and educators from communities across the East Baton Rouge Area. We understand that familiarity with the campus and the design of this outdoor space may sound good on paper, but who will lead students and teachers through the Southern University Educational and Interpretive Forest? Southern University students will volunteer and act as guides for teachers and classrooms through the outdoor classrooms and the stations. These students will be trained on the curriculum, to ensure that they may be able to offer excellent guidance and foster the education for the visiting students and classrooms. The Southern University Students will be ambassadors and will be the face of Southern University. To capture the volunteer hours of these docent leaders, a Volunteer Log has been included in *Appendix C*. Use this form to track volunteer hours. These volunteer hours can be beneficial in many grant applications.

TRIP PLANNING

Pre-Visit Background Information

Prior to your field trip you will be provided with a binder of information to review yourself, as well as with your students. In the back of the binder, you will find a site map of the university (Figure 1), a station flow map (Figure 2), a map showing the location of medical facilities (Figure 3) as well as curriculum that can be used with your class. Each lesson contains a hands-on activity to be done at the site. Your group of students will be scheduled to participate in as many stations as you see fit. All students will benefit from each of the three stations. It is important that the pre-visit activities are completed to make the on-site experience the best learning opportunity possible. (*See Appendix D*)

Lunch/Snacks

Visiting our site is sure to be exciting and full of exploring and adventure. We know that your group may get hungry for snacks and need breaks to recharge while at the stations in our outdoor classroom. At each station, we have designated picnic eating area with benches and tables. We will also have trash receptacles and recycle bins placed strategically around the eating areas and near each station. Please only eat in designated areas. We encourage the use of personal water bottles instead of disposable water bottles. Discard any trash while on site and please recycle when possible by placing recyclables in the appropriate receptacles.

SITE SAFETY

Before making your trip to Southern University, please review the following safety procedures set in place to ensure a happy and healthy event.

STUDENTS

When you take a field trip with your students, please establish some guidelines that promote caring for the environment. You will find the Southern University Educational and Interpretive Forest Code of Ethics in *Appendix E*. Be sure to discuss this code with your students, then provide students with the pre-field trip activity found in *Appendix D* to ensure that they comprehend what is expected of them while they are touring Southern University's beautiful campus.

SUPERVISION

Please review the above with chaperones and bus drivers as well, so they understand what is expected of anyone entering Southern University's campus. Southern is a thriving university with many students and faculty who are walking on campus, as well as transitioning to classes. It is our hope that we respect the students and administration in attendance so they will continue to allow us to use their site as a place to teach students about the environment.

WHAT TO WEAR

All participants should come prepared with proper clothing and footwear (closed toe shoes recommended) for an outdoor experience. It is good to avoid using heavy fragrances during the day so not to attract insects. Monitor the weather before coming to the site, to dress accordingly. Remember that most of the activities are outdoors in open space, so sunscreen, hats and appropriate clothing is essential.

SAFETY

The safety of each student is our number one concern. Please remember that this is an outdoor field trip, designed to bring your students close to nature, and actually bring the classroom outdoors. With that, there are to be expected some natural safety concerns to be aware of while on site.

1. **Sun-** Please be aware that most of the activities are outside, with expected exposure to sun and potential for sun burns. Please plan accordingly.
2. **Wildlife-** While at the site, students could encounter wildlife. We ask that each student respect the wildlife, and remain in designated areas. If any wildlife is spotted, do not provoke, rather alert your tour guide.

3. **Insects**- Insects are a part of Louisiana. While outdoors, you may experience Mosquitos, Bees, Wasps, Spiders, etc. We suggest insect repellent spray, to help manage this nuisance. Please Plan accordingly.
4. **Slips, Trips and Falls**- Remember, we are walking outdoors, where the ground is uneven and slips, trips and falls might occur. Please remind your students to be aware of their surroundings. Remaining in designated areas may help, but the best plan is for students to step carefully, as to avoid slips, trips and falls.
5. **If you see something, Say something!!**- Stay with your tour guide, and report suspicious or hazardous behavior or actions to the tour guides.

BUS PARKING

All buses and vehicles must remain on paved areas and park in designated parking areas only.

WEATHER

South Louisiana is known for its sports, food and weather! We suggest you check the projected weather, when you plan your trip. As your scheduled trip gets nearer, monitor the weather. This will help you plan your field trip effectively. Please remember that this is an outdoor classroom, and shelter is available at the Pavilion Area.

IN CASE OF EMERGENCY

While on a field trip to Southern University's Campus, here are several key emergency contacts that will help you be prepared, in the case of an emergency situation should arise. Your primary point of contact while on campus is SUBR Police Chief, Ron Stevens, (225)771-2770.

In case of an **Emergency** on campus, please contact The Southern University Police:

- Ron Stevens, SUBR Chief, (225) 771-2770
- Kevin Johnson, SUBR, Chief's Assistant, (225) 620-6390
- Robert Nissan, Safety & Health, (225) 936-7010

A Map showing the Medical Facilities on campus can be found in the Figure 3.

We understand that each emergency is unique. It is important to remember that there are three main entrances/exits on campus; Harding Boulevard (to the South), Mills Avenue (to the North) and Swan Avenue (Central). All three of these entrances/exits will get you in to campus from Scenic Hwy, or you can exit the campus to Scenic Hwy. These will be controlled as needed for the emergency situations.

KEY WORDS TO KNOW

Adaptation – a modification in behavior, physical feature, or other characteristic that helps a living thing survive in its environment

Alluvial Plain- a large landform created by the deposition of sediment over a long period of time, usually by one or more river systems

Best management practices (BMPs) – preferred actions to prevent pollution

Biologist is the person in charge of identifying and observing the animals and plants in each specific area.

Botanist- a scientist that studies plants or works with plants

Bottomland Hardwood Forests- a type of forest found in lower lying topographical areas

Buoyancy-a fluid exerts an upward force on objects less dense than itself

Cartographer is the person in charge of the maps.

Commerce- is the whole system of an economy that constitutes an environment for business.

Condensation – process of water changing from vapor into liquid droplets

Drainage Basin- a topographic region in which all water drains into a common area

Ecosystem – a group of plants and animals that interact and adapt to a physical environment, including climate, water, air, and soil

Endangered species - a species in danger of extinction (dying out)

Erosion – process by which soil, sediment or other materials are worn away and moved by water or wind

Evaporation – process of water changing from liquid into vapor by application of heat

Exotic species - a plant or animal introduced from a different area that competes with the native species

Export- a product that is shipped out of a country via boat, plane, rail or truck

Food web - a complex, interlocking series of individual food chains

Fresh water marsh – a wetland where fresh (non-salty) water normally exists all year

Forest – an ecosystem in which trees are the most dominant member

Forester- a scientist that studies trees, or works with trees and forests

Ground water – water that flows or resides underground, including in water-rich layers called aquifers

Habitat - the surroundings where a plant or animal lives and finds the resources it needs for life, including food, water, shelter, and space

Hydrologist is the person in charge of identifying and observing the various water features.

Impervious surface – land covering, such as concrete or asphalt, that does not allow water to pass through it into the ground

Import-a product shipped into another country, via boat, plane, rail or truck

Invasive species- introduces or non-native species to an area

Migrate – to travel from one region to another, usually seasonally

Native species - a species originally living in and adapted to a given place

Non-point source pollution – water pollution that comes from a large general area such as a farm field, construction site, yard, streets or parking lots (also known as “*runoff pollution*”)

Nutrient – element or substance (such as fertilizer or decayed leaves and grass) that supplies food for plant growth, but which in large concentrations can cause pollution

Point source pollution – water pollution that comes from a single point such as a pipe

Pond - a still body of water smaller than a lake, often shallow enough for rooted plants to grow throughout

Population - all of one kind of plants or animals in a specified area

Prairie – a grassland community; ecosystem in which grasses are dominant

Precipitation – water moving from the air to the ground, such as rain snow hail or sleet

Project manager is the person in charge of supervising the project and keep everyone on task. This person will present the final product.

Riparian Zone- The Riparian Zone is a small strip of vegetated land found near the shore of a bayou, stream, river or body of water.

River – a large natural stream of moving water that flows to a lake or ocean

Runoff – water from snowmelt or rain that flows over land to a river or other water body

Sediment – particles of soil and solid material that can be carried by water or wind

Soil profile- soil horizon, layers of soil found in earth

Stewardship – the act of caring for our environment

Storm drain – opening in streets and parking lots through which runoff flows into underground pipes that lead to rivers, ponds or lakes (storm drains do *not* lead to a water treatment plant)

Storm drain outfall – the end of a pipe leading into a river or other water body from a storm drain

Surface water – water that flows or resides above ground in streams, lakes, rivers, and wetlands

Transpiration – process of water entering the atmosphere from plants

Urban Forester- a scientist that studies or works with trees in an urban setting

Water cycle – the continual process of water moving in various forms (liquid, vapor and solid) over and through earth's surface, ground, and atmosphere

Water pollution – any substance that contaminates water making it unfit or unhealthy for use

Watershed – the area of land from which water flows to a given stream, river or lake

Wetland – a wet land with specialized soil and plants, regularly or always flooded, found on edges of rivers, creeks, ponds, lakes, depressions, bays or oceans

STATION 1 – MISSISSIPPI RIVER/SCOTT'S BLUFF

BACKGROUND

The Mississippi is much more than a ribbon of water; it is a watershed that drains all or parts of 31 states and 2 Canadian provinces. It is the dominant watershed in North America, and drains 41% of the 48 contiguous states of the United States; it is the third largest watershed in the world. It is only exceeded in size only by the watersheds of the Amazon and Congo Rivers.

Likewise, the basin covers more than 1,245M square miles (or 3,225M square kilometers) and includes all or parts of 31 states and two Canadian provinces. Waters from as far east as New York and as far west as Montana contribute to flows in the lower river, and create an overall basin that resembles a funnel—its spout emptying into the Gulf of Mexico.

The name "Mississippi" comes from the Anishinabe people (Ojibwe Indians.) They called the river "Messipi" or "Mee-zee-see-bee," which means "Big River" or "Father of Waters." Dakota Indians called the river "Hahawakpa," meaning "River of the Falls" in reference to the falls we now call the Falls of St. Anthony.

The Mississippi River is the third longest river system in the world when including the Missouri River tributary. The Mississippi itself stretches approximately 2,350 miles from Lake Itasca to the Gulf of Mexico. The actual length of the river may vary from year to year; its length is now shorter than it was a century ago due to the cutting off of meanders, engineering and other factors.

Over geological time the river has grown by the depositing of sediment at its mouth it even helped to create the Gulf States! Today approximately 230 million tons of sediment is carried annually to the Gulf by the river.

The Upper Mississippi River carved its path with the meltwater of receding glaciers from the last Ice Age more than 10,000 years ago. In geological terms, the Upper Mississippi from its headwaters to the Twin Cities is a very young river.

The glacial River Warren Falls, thought by some geologists to be the largest waterfall ever seen in North America, occurred in what is now downtown St. Paul 11,700 years ago. At that time the falls may have been 200 feet high and over a half-mile wide. It was fed by a torrent of meltwater from Glacial Lake Agassiz coursing its way down what is now known as the Minnesota River valley. The falls gradually receded upstream as the layer of soft sandstone underlying the limestone caprock was eroded away. By 10,000 years ago the falls had passed the point where the Minnesota and Mississippi Rivers now join, and the falls we know as St. Anthony Falls was carving a gorge on its way to its present location. St. Anthony Falls is the only waterfall on the entire length of the Mississippi, and the gorge below it that divides Minneapolis and St. Paul is the river's only true gorge.

More than 400 native species of fish are at home in the Mississippi River watershed; 292 bird species use the Mississippi Flyway. Other wildlife of the river, bottomlands and bluffs of the Mississippi watershed includes 57 species of mammals, 45 species of reptiles and amphibians, 40 different species of mussels, and countless invertebrates. The Mississippi also acts as a vital migration corridor for 60 percent of North America's bird species and provides critical habitat for freshwater mussels, otters and other creatures including the rare Louisiana black bear.

The river and its major tributaries supply drinking water for more than 18 million people. The Mississippi River is both a sewer and a drinking water source!

To enable towboats and barges to travel upstream from St. Louis, 29 locks and dams have been built between there and Minneapolis.

At the mouth of the Mississippi River in the Gulf of Mexico there is an area of 5,000-8,000 square miles called the "dead zone." The Dead Zone is severely depleted of oxygen due to an overabundance of nutrients (from fertilizers, decaying plant matter, etc.) and contaminants carried into the Gulf from the Mississippi. Because the everyday practices of people, agriculture and industry are responsible for the Dead Zone, it is changes in our every day practices that can lead to restoration of the Dead Zone. A leading cause of Mississippi River pollution is runoff from urban streets and rural farmland. Such runoff carries pollutants directly to the river without treatment.

More than half the goods and services consumed by citizens of the United States are produced with water that flows through the Mississippi River and its major tributaries—the Ohio, Missouri, Arkansas and Red rivers. Agricultural products from the basin are worth \$54 billion annually and represent 92 percent of the nation's farm exports.

The Mississippi also serves as a vital conduit for goods, is home to the largest port in the U.S., and gives life to the Gulf of Mexico's vibrant seafood industry. Its basin supports commercial fishing and outdoor recreation as well, generating billions of dollars each year to support local and regional economies.

The Mississippi River Basin has been highly altered over the last 200 years. Largely due to settlement and development adjacent the river in the fertile floodplains. This area is also called the alluvial plain. This area, once saw the Mississippi River meander back and forth carrying and depositing millions of cubic yards of sediment and soil, has been altered by man. With the construction of the levee system and flood control structures, the Might Mississippi River has been channeled and restricted to flow in one path. As a result of conversion of land from grassland and forest to agricultural production and urban areas; protection of people and property from variable and sometimes devastating floods; and construction of a commercial navigation system to transport agricultural and other bulk commodities to national and international markets.

Today, the river has altered hydrology, altered sediment and nutrient cycling regimes, altered flows and longitudinal connectivity, and altered lateral connectivity within the river floodplain. Over time, many of these alterations have led to environmental degradation, which has been the inspiration for management actions to mitigate the impacts (Mississippi National River & Recreation Area, 2008).

SCOTT'S BLUFF

This bluff is believed to have been named for Dr. William Bernard Scott, who bought the property from Lelia Skipwith in 1839. She was the daughter of Fulwar Skipwith, governor of the 1810 West Florida republic and widow of Thomas Bolling Robertson, governor of Louisiana 1820-1824. Both governors lived here. Robertson from 1823 to 1828 and Skipwith in the 1830's.



OVERVIEW OF STATION 1: THE MISSISSIPPI RIVER AND SCOTT'S BLUFF

This station is located at the Visitor's Center, overlooking Scott's Bluff and the Mississippi River (see Figure 2 for station location). At this station Students will observe The Mississippi River, and Scott's Bluff, compare this site's features and characteristics to other stations, and create a scientific illustration of the site. Students will also investigate principals of buoyancy and apply those principles to the transportation of goods and services along the mighty Mississippi River. Students may also discuss the historical features that can be observed while sitting atop Scott's Bluff.



Lesson 1-Station 1

The River is a Poem Grades: 3-5

Materials:

- Learning Journal
- Pencil
- Sample Sheet of Types of Poetry
- Chart Paper

Common Core State Standards-ELA

Grades 3-5 Language Standards

1. Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

Grades 3-5 Writing Standards

4. With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.
5. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
6. With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.

Objective: To use different parts of speech to create different forms of poetry
To understand figurative language, word relationships, and word meanings

Engage

Have students share what they know about the different forms of poetry. Make sure to take notice if students bring up rhyming words. Remind students that not all poetry requires rhyming words and the ones we will create today will not meet this requirement.

Explore

Have students write nouns in their student Learning Journal under Station 1 Lesson 1. Encourage students to share nouns that they recorded. Remind students that this would include words that can be considered a person, place or thing. Record words on chart paper if possible or have student(s) record words to share with others. (Tree, birds, water, ecosystems, fountain, soil, river, etc.)

Have write adjectives in their Student Learning Jounal under station 1 Lesson 1. Encourage students to share adjectives that they recorded. Remind students that this would include words that describes a noun. Record words on chart paper if possible or have student(s) record words to share with others. (Green, two, petite, huge, short, tall, etc.)

Have students share verbs that come to their mind while observing the outdoors. Remind students that this would include words that can be considered an action. Record words on chart paper if possible or have student(s) record words to share with others. (Swimming, digging, run, walk, floating, etc.)

Explain

Go over the first type of poetry and example (Appendix 5). Have students use their view over the Mississippi River to write a Diamonte.

Rules for Diamonte (diamond shaped) poetry:

Line 1: Noun
Line 2: Adjective, Adjective
Line 3: Verb, Verb, Verb
Line 4: Noun, Noun, Noun, Noun
Line 5: Verb, Verb, Verb
Line 6: Adjective, Adjective
Line 7: Noun

Example: Ecosystem

Large, Complex
Producing, Consuming, Decomposing
Vegetation, Wildlife, Habitat, Niche
Competing, Preying, Interacting
Connected, Universal
Community

Students write their own Diamanté in their Science Journal.

Go over second type of poetry. Review syllables with students. Then go over the various ways to determine syllables. (Appendix 6)

Rules for Cinquain poetry:

Line 1: Title in 2 syllables (or words)
Line 2: Description of the title in 4 syllables (or words)
Line 3: Description of action in 6 syllables (or words)

Line 4: Description of a feeling in 8 syllables (or words)
Line 5: Another word for the title in 2 syllables (or words)
Example: river

water, wildlife
flowing, rippling, flooding
with grace and strength it rolls to sea
life source

Have students record Cinquain in Science Journal.

Elaborate

Ask students to share one of their poems with another student.

Evaluate

Have students use technology to type poem and draw a picture with the Cinquain or Diamante.

Note to Teacher:

Students may want to try a Haiku or Free Verse

Lesson 2–Station 1

The Mighty Mississippi

Grades: 3-5

Materials for each group:

- Pencils
- Paper
- Aluminum trays
- Craft sticks
- Scissors
- Colored Clay (Brown, Blue, Yellow, Green)

GLE's:

GLE 9: Describe and compare the physical characteristics of various regions of Louisiana (G-1B-E1)

GLE 11: Describe how people and the physical environment have changed over time in Louisiana based on given information (G-1B-E3)

GLE 13: Identify examples of physical processes affecting Louisiana (e.g., coastal erosion, river changes) (G-1C-E1)

GLE 15: Identify and explain patterns of settlement in different time periods in Louisiana (G-1C-E3)

GLE 17: Identify the relationship between geography and economic activities in Louisiana (G-1C-E5)

GLE 19: Identify and explain ways in which people in Louisiana modify the physical environment to meet basic needs and achieve certain purposes (e.g., clearing land for urban development) (G-1D-E1)

GLE 20: Explain how humans have adapted to the physical environment in Louisiana (G-1D-E2)

GLE 51: Describe changes in community life, comparing a given time in history to the present (H-1B-E2)

GLE 53: Identify people and their influence in the early development of Louisiana (H-1C-E1)

GLE 54: Describe the importance of events and ideas significant to Louisiana's development (H-1C-E1)

GLE 11: Identify geographical/physical reasons for regional variations that influence patterns of settlement and land use in the United States and the world, past and present (G-1C-E2)

GLE 18: Describe the importance of specific natural resources to human survival and human endeavors (G-1D-E4)

GLE 7: Identify ways in which location and physical features influence the development or life in a region of the United States (e.g., effects of natural barriers) (G-1B-M2)

Objective: By the end of this lesson, students should be able to:

- Realize the importance of the Mississippi River as a means of transportation in the past and present
- Identify the relationship between the Mississippi River and the location of cities
- Identify the importance of water as a need for our bodies and as a source for transportation and living
- Identify landmarks such as the State Capital, old and new Mississippi River bridges
- Realize the importance of rivers and bridges to commerce
- Identify a natural levee and the need for levees
- Identify and explain ways in which people in Louisiana modify the physical environment to meet basic needs

Engage:

Instruct the students to look down river and quickly sketch or write in their Learning Journal, Lesson 2 Station 1 what they observe. Help students by pointing out living (biotic) and non-living (abiotic) features that they observe. Briefly discuss their drawings and descriptions. (Items discussed should be, the levee, the Mississippi River, the industry, the forest and swamps, the boats and barges, etc.)

Explore:

Put students into even groups. Give each group a set of materials. Tell them that they are Huey P. Long- a past Louisiana Governor, and that they want to create more trade for Baton Rouge and Louisiana. Inside the aluminum tray, have the group construct what they observed (students should use the brown colored clay to represent the levee system, blue colored clay to represent the river, the green colored clay can represent the natural “green space” areas, the craft sticks can represent the boats and barges or bridges, roads, etc). Build a model of what was observed with the aluminum pan and the clay. Use the crafts sticks to build roads, bridges, barges etc. Design new ways to get from one side of the river to the other, and the best way to go up and down the river. Have students share what they did and why. (This may mean new bridges are build, and forests are cut down, etc.)

Explain:

Discuss how humans have adapted their surroundings to meet their needs (bridges, levees, tug boats, barges etc.) Have students get into groups and discuss how life has changed due to people. What are the impacts that people have had to the natural environment? How will increasing the boat traffic and the construction of new bridges impact our city? Ask: why do they think people settled in this region? What is the significance of the Mississippi River? How valuable is the River to our local economy, or commerce, or way of life?

Elaborate:

Instruct students to walk around and find ways that man has impacted the natural and physical environment. What changes have happened where they are standing? How is this area different from where they live or their school?

Evaluate:

When students return to school, have groups or individuals research one of the following:

Huey P. Long, New Mississippi River Bridge, Old Mississippi River Bridge, Factories along the Mississippi River in Louisiana, Tug boats and barges, plantation life, changes in the Mississippi River over the years.

Lesson 3-Station 1

Glue Line Relief **Grades: 3-5**

Materials:

- Poster board
- Drawing Pencils
- White Glue in small bottle (Eilene's tacky glue suggested)
- Heavy duty Aluminum Foil
- Rubber Cement
- India Ink

Benchmarks: VA-CE-M1, VA-CE-M2, VA-CE-M3, VA-AP-E1, VA-AP-E3, VA-CA-M1, VA-CA-M5

Class Time: approximately one week

Vocabulary:

Relief- the projection of forms or figures from a flat ground, so that they are partly or wholly free of it

Elements of art Sensory components used to create and talks about works of art; line, color, shape/form, texture, value, space.

Abstract Artwork in which the subject matter is stated in a brief, simplified manner; little or no attempt is made to represent images realistically, and objects are often simplified or distorted

Principles of design A design concept describing the ways in which the elements of an image are arranged (i.e. balance, contrast, dominance, emphasis, movement, repetition, rhythm, variation, unity).

Design The plan, conception, or organization of a work of art; the arrangement of independent parts (the elements of art) to form a coordinated whole.

Composition The overall placement and organization of elements in a work of art, as well as the interrelationships between individual elements.

Objectives:

- To observe in nature the use of line - shows awareness of elements and principles
- Work in relief - mixed media - create layers
- Give antique patina

- To notice the art in nature and how line is used to create recognizable shapes

Engage:

Teacher will talk about the elements of art and principles of Design. Teacher will elaborate on the significance of composition in Art. If you divided your artwork into 4 parts and only looked at that section, would those lines in that section be interesting. Students will notice how lines create a shape such as a horizon line is flat, a tree using has curves for leaves and the trunk is usually a straight line with slight curves....Teacher could show recognizable shapes such as a stop sign, a traffic light, a wave so that students will begin how shapes communicate to us what the object is.

Explain:

Teacher will take students outside and have them draw an observation from nature using line. (Lesson could be altered by using a map and having students draw a line over a few roads or waterways)

You could add texture into the shapes that has been drawn

Glue Line Foil Relief

1. Draw a pencil drawing on posterboard using a single line. Drawing could be from observation of trees, landscapes...
2. Trace over the pencil drawing with Elmer's or white school glue. Make a thick raised glue line. (I purchased small bottles for small hands.)
3. Let dry. It may take a day or two.
4. Brush rubber cement on the glue line picture and immediately cover with heavy duty aluminum foil. Tell the children to use their finger to press every inch of the foil on the posterboard to bring out detail.
5. Lightly burnish the foil with a very fine grade of steel wool. Burnish it until the foil is dull.
6. Brush black india ink over the burnished foil and let dry.
7. Burnish again (to remove the dried india ink) with the fine steel wool to create areas of light and dark.
8. Once you are finished the picture will resemble a 3 dimensional tin photograph.

EXAMPLES OF WORK



Elaborate:

Have students write an art critique of their work using proper art vocabulary as well as standard art critique form.

Evaluate:

Find a place in classroom or school and display artwork.

Assessment:

Elementary Art Rubric, Grades

Title of Lesson:

Grade:

Objective of Lesson: See Lesson Plan

***Criteria to be assessed in Content/ Concepts area of Lesson:**

	1 Unsatisfactory	2 Needs Improvement	3 Proficient	4 Advanced	Score
*Content/ Concepts	The student's work demonstrates no understanding of the concept(s) taught. There is no apparent relationship between the student's artwork and the lesson's content.	The student's work demonstrates little understanding of the concept(s) taught. Evidence of learning and affective application of the lesson's content are somewhat lacking.	The student's work demonstrates an understanding of the concept(s) taught. There is evidence of learning and satisfactory application of the lesson's content.	The student's work demonstrates a deep understanding of the concept(s) taught. There is strong evidence of learning and effective application of the lesson's content.	

<p>Creativity</p>	<p>The student's artwork shows no evidence of creative risk taking. The final product does not reflect a unique and original point of view.</p>	<p>The student's artwork demonstrates minimal creativity and risk taking. The final product shows little evidence of personal point of view and originality.</p>	<p>The student's artwork demonstrates some creativity and risk taking. The student's personal interpretation of the lesson demonstrates a unique point of view and some originality.</p>	<p>The student's artwork reflects an exceptional level of creativity and risk taking. The student's personal interpretation of the lesson demonstrates a unique, original and expressive point of view.</p>	
<p>Craftsmanship</p>	<p>Art media, materials and resources are inappropriately used. Completion of product is hurried with little attention to detail or structural integrity.</p>	<p>While some care has been taken to ensure a quality product, the materials are not always used appropriately. Lack of follow through results in a compromised quality of product.</p>	<p>The student's use of art media, materials and resources is generally appropriate and demonstrates a reasonable amount of care and attention to detail.</p>	<p>The student's use of the art media, materials and resources is consistently appropriate and demonstrates, from the beginning of the lesson to the end, care and attention to detail.</p>	

National Standards:

1. Understanding and applying media, techniques, and processes	2. Using knowledge of structures and functions	3. Choosing and evaluating a range of subject matter, symbols, and ideas	4. Understanding the visual arts in relation to history and cultures	5. Reflecting upon and assessing the characteristics and merits of their work and the work of others	6. Making connections between visual arts and other disciplines (this can be brought in)
Students apply media, techniques, and processes with sufficient skill, confidence, and sensitivity that their intentions are carried out in their artworks		Students reflect on how artworks differ visually, spatially, temporally, and functionally, and describe how these are related to history and culture	Students differentiate among a variety of historical and cultural contexts in terms of characteristics and purposes of works of art	Students identify intentions of those creating artworks, explore the implications of various purposes, and justify their analyses of purposes in particular works	Students compare the materials, technologies, media, and processes of the visual arts with those of other arts disciplines as they are used in creation and types of analysis
Students conceive and create works of visual art that demonstrate an understanding of how the communication of their ideas relates to the media, techniques, and processes they use	Students evaluate the effectiveness of artworks in terms of organizational structures and functions		Students describe the function and explore the meaning of specific art objects within varied cultures, times, and places	Students describe meanings of artworks by analyzing how specific works are created and how they relate to historical and cultural contexts	Students compare characteristics of visual arts within a particular historical period or style with ideas, issues, or themes in the humanities or sciences
	Students create artworks that use organizational principles and functions to solve specific visual arts problems			Students reflect analytically on various interpretations as a means for understanding and evaluating works of visual art	(Note: Look at the examples of non-objective art - make connections to literature, music and world events when those works were created)

Lesson 4- Station 1

History of the Port of Baton Rouge

As the furthest inland Mississippi River port that can handle ocean-going cargo carriers and tankers, the Port of Greater Baton Rouge facilitates the movement of cargo from ship to barge, rail, pipeline, and road to be delivered throughout the United States' central regions.

The biggest industry in the Port of Greater Baton Rouge is petrochemical manufacturing and production. The Port of Greater Baton Rouge is home to the second biggest oil refinery, owned by ExxonMobil, in the United States. One of the biggest employers in the Port of Greater Baton Rouge is state government.

Before the 1920s, port facilities in the Port of Greater Baton Rouge were little more than wooden wharves dotting the edge of the Mississippi River. Simple mooring was possible. Private docking facilities upriver of the Port of Greater Baton Rouge were operated by Standard Oil Refinery (now owned by ExxonMobil), making up the majority of the city's waterborne commerce.

In the 1920s, the need for public docking facilities for smaller shippers and port users became apparent. The Baton Rouge Municipal Dock started operating in 1962. In 1952, the State Legislature created the Greater Baton Rouge Port Commission. Work began on General Cargo Dock No. 1, the grain dock, and the grain elevator in 1954.

Today, the Port of Greater Baton Rouge is one of the Nation's top ports for total tonnage handled. The Port of Greater Baton Rouge handles a wide variety of products that include agricultural products, forest products, coal and ores, steel and pipe, chemicals, and petroleum products.

Port Commerce

The Greater Baton Rouge Port Commission was created in 1952. Governed by 15 commissioners who serve four-year terms, the Port of Greater Baton Rouge was created to control commerce and traffic along the river and to build and operate port facilities for the public.

The Port of Greater Baton Rouge is an important part of the economy and the maritime industry of the State of Louisiana. The Port of Greater Baton Rouge is located where the Mississippi River and the Gulf Intracoastal Waterway converge, linking it to ports from north Florida to south Texas and the remaining inland Mississippi River System.

The US Army Corps of Engineers maintains a 13.7-meter (45-foot) deep-water channel from the Port of Greater Baton Rouge to the mouth of the Mississippi River. The Port of Greater Baton Rouge is located next to the Port Allen Lock, the northernmost point on the Mississippi where barges can get to the Gulf Intracoastal Waterway.

The Port of Greater Baton Rouge's jurisdiction stretches for almost 137 kilometers (85 miles) of the Mississippi from the ExxonMobil Refinery to the north to Sunshine Bridge to the south. Parishes (counties) included in the Port of Greater Baton Rouge's jurisdiction include East Baton Rouge, West Baton Rouge, Ascension, and Iberville.

The Port of Greater Baton Rouge borders US Interstate Highways 10, 12, and 100 and Louisiana Highway 1. Its location also facilitates easy access to US Interstates 49 and 55 and US Highway 61. Three major railways serve the Port of Greater Baton Rouge: Union Pacific, Canadian National/Illinois Central, and Kansas City Southern.

The economic impact of the Port of Greater Baton Rouge extends far beyond the metropolitan area. The Port of Greater Baton Rouge handles over 53 million tons of cargo per year, making it one of the country's leading ports. Port of Greater Baton Rouge activities generate more than \$11.3 billion in state spending and more than 20 thousand jobs across Louisiana, including a total payroll of almost \$119 million. Within the four parishes that make up the Port of Greater Baton Rouge, more than \$118 million is generated each year in tax revenue.

Port of Greater Baton Rouge facilities include both shallow-draft and deep-water terminals. Port facilities offer intermodal access between docks, rail, and highways. The sea-shipping terminal in the Port of Greater Baton Rouge has container-handling equipment and value-added services like bagging and cross-dock stuffing. The London Metal Plastic Exchange has approved the Port of Greater Baton Rouge as a delivery area, and the port offers a full range of Foreign Trade Zone services.

The Inland Rivers Marine Terminal in the Port of Greater Baton Rouge is strategically located to connect the heartland of the United States with international markets. It is also a transshipment point between Gulf of Mexico seaports like Houston and New Orleans. Several companies are located in the Port of Greater Baton Rouge's Inland Rivers Marine Terminal. The Port of Greater Baton Rouge owns the Baton Rouge Barge Terminal, where it handles aggregate, bulk products, coke, and wood chips. Kinder Morgan leases and operates a bulk terminal which has rail service and a coal-handling facility. This terminal has berthing space of 300 meters (985 feet) with alongside depth of 2.7 meters (12 feet) LWRP. Kanorado Corporation leases and operates another public bulk terminal.

The Port owns and operates several specialty terminals that handle a variety of products from oil and petroleum to grains and flour.

Several private docks are located within the jurisdiction of the Port of Greater Baton Rouge. Companies like ExxonMobil, BASF, the Dow Chemical Company, and other petrochemical companies operate docks and ship both domestic and international cargoes from the Port of Greater Baton Rouge.

General cargo facilities in the Port of Greater Baton Rouge offer 914 linear meters (3000 linear feet) of continuous wharf and 13.7-meter (45-foot) access for ocean-borne vessels. An unlimited turning basin is used by ocean-going vessels. General cargo facilities include 48.8

thousand square meters (525 thousand square feet) of warehouse space on the Mississippi River and 4.6 thousand square meters (50 thousand square feet) of shipside storage.

Lesson 4-Station 1

Boats along the Mississippi River

Grades: 6-8

Materials:

- Sheets of aluminum foil, approximately 12" X 6"
- Tubs of water
- Pennies, up to 100 per tub
- 1 tsp of bleach per tub
- Paper towels
- Bowls for pennies

Preparation:

Fill tubs with 3 to 4 inches of water. Add 1 tsp of bleach to each tub. Cut aluminum foil into 12" X 6" sheets. Put pennies in bowl and provide towels for spills.

Put students in pairs.

Vocabulary:

- **Buoyancy**-a fluid exerts an upward force on objects less dense than itself
- **Commerce**- is the whole system of an economy that constitutes an environment for business.
- **Import**-a product shipped into another country, via boat, plane, rail or truck
- **Export**- a product that is shipped out of a country via boat, plane, rail or truck

Objective:

- Students will understand the concept of buoyancy.
- Students will learn why barges are designed the way they are compared to ships
- Students will learn why the Mississippi River is important to Louisiana's economy and United States.

GLEs

- Characterize and analyze the use of productive resources in an economic system(E-1A-M6)
- Use economic concepts (e.g., scarcity, opportunity cost) to explain historic and contemporary events and developments in Louisiana (E-1A-M9)

- Explain reasons for trade between nations and the impact of international trade (E-1B-M6)
- Describe historical and economic factors influencing the economic growth, interdependence, and development of Louisiana and the nation (e.g., mass production, oil boom and decline) (E-1B-M7)
- Explain the relationships among force, mass, and acceleration (PS-M-B5)
- Identify forces acting on all objects (PS-M-B3)
- Recognize that science uses processes that involve a logical and empirical, but flexible, approach to problem solving (SI-M-B1)
- Write clear, step-by-step instructions that others can follow to carry out procedures or conduct investigations (SI-M-A7)
- Distinguish between *observations* and *inferences* (SI-M-A7)
- Construct, use, and interpret appropriate graphical representations to collect, record, and report data (e.g., tables, charts, circle graphs, bar and line graphs, diagrams, scatter plots, symbols) (SI-M-A4)
- Record observations using methods that complement investigations (e.g., journals, tables, charts) (SI-M-A3)
- Identify problems, factors, and questions that must be considered in a scientific investigation (SI-M-A1)
- Generate testable questions about objects, organisms, and events that can be answered through scientific investigation (SI-M-A1)
- Develop models to illustrate or explain conclusions reached through investigation (SI-M-A5)
- Evaluate models, identify problems in design, and make recommendations for improvement (SI-M-B4)
- Determine the results of constructive and destructive forces upon landform development with the aid of geologic maps of Louisiana (ESS-M-A7)
- Distinguish among several examples of erosion (e.g., stream bank, topsoil, coastal) and describe common preventive measures (SE-M-A10)

*******Key concepts:** An object floats if water's density is greater than the object. By enclosing air, which is much tighter than water, even steel boats can float. Without buoyancy, river and sea transportation, exploration and commerce could not have been possible.

Engage :

Teacher asks students these questions:

- What kinds of boats did they see on the Mississippi River or have seen on other rivers?

- Do the boats on the Mississippi River look different from the ones they may have seen in other locations?
- What would these boats bring up and down the Mississippi River?

Explore:

Have students draw a picture of a boat they may have seen on the Mississippi River or another river. Make sure students explain the boat they have drawn and tell what kind of boat it could be (sport, fishing, canoe, hunting, cargo, tug boat, barge, etc.)

Explain:

Explain to the students that today they are going to do an experiment to find out what design of a boat holds the most materials. The boat will be made out of aluminum foil. The boat should be designed to float on water and be able to hold pennies which represent the goods that are shipped along the Mississippi River. Once students complete their designs in pairs, have students float the foil on water. Have students PREDICT how many pennies their boat will hold once the boat is made. (Boat 1)

Have students add pennies to foil boat until it sinks. Count the number of pennies the boat held. Have students confirm if their prediction was correct.

Have students use another sheet of aluminum foil to create another boat hull and repeat the test. Have students PREDICT how pennies this boat will hold.

Have students add pennies to foil boat until it sinks. Count the number of pennies the boat held. Have students confirm if their prediction was correct. (Boat 2)

Elaborate:

Pass out “How Does a Steel Boat Float?” Make sure to point out to the students that the only way the steel (aluminum foil) will float is to make sure it is formed into a watertight space that encloses air.

Ask students to write about their design that held the most pennies.

What is the equivalent “boat” to their design? (Canoe, barge)

How does the placement of pennies in the boat affect the number the boat will hold?

What kinds of boats are used on the Mississippi River to haul cargo? Why? What advantages do barges have over deep hull boats?

Evaluate:

Students should understand that the best designs are airtight flat barges with small sides. The placement of the pennies also makes a difference in the number held.

Make sure understand from the background information that the Port of Baton Rouge, which they can see from Scott's bluff, is one of the largest ports in North America. It mainly exports petrochemicals, along with many different agriculture products like sugar cane, soybean, cotton, and grains. These goods rely on a variety of boats that can easily go up and down the Mississippi River. (Information in RED is important to go over)

Have students write about why the Mississippi River is important to Louisiana, specifically Baton Rouge's economy.

Lesson 5-Station 1

Map Relief **Grades: 6-8**

Materials:

- Newsprint
- Drawing Pencils
- Maps,
- White Glue,
- Crystal Clear Acrylic Spray Paint
- Chipboard or Canvas or Scrap wood
- Mat board scraps,
- Acrylic paint and oil paint,
- Scrap paper, paint brushes

Benchmarks: VA-CE-M1, VA-CE-M2, VA-CE-M3, VA-AP-E1, VA-AP-E3, VA-CA-M1, VA-CA-M5

Class Time: approximately 5-45 minute periods

Vocabulary:

- **Relief-** the projection of forms or figures from a flat ground, so that they are partly or wholly free of it
- **Elements of art-** Sensory components used to create and talks about works of art; line, color, shape/form, texture, value, space.
- **Abstract-** Artwork in which the subject matter is stated in a brief, simplified manner; little or no attempt is made to represent images realistically, and objects are often simplified or distorted
- **Principles of design-** A design concept describing the ways in which the elements of an image are arranged (i.e. balance, contrast, dominance, emphasis, movement, repetition, rhythm, variation, unity).
- **Design-** The plan, conception, or organization of a work of art; the arrangement of independent parts (the elements of art) to form a coordinated whole.
- **Composition-** The overall placement and organization of elements in a work of art, as well as the interrelationships between individual elements.

Objectives:

- Awareness of abstract /non-objective art
- Found composition (using map) - shows awareness of elements and principles
- Work in relief - mixed media - create layers
- Give antique patina
- Critique non-objective art - discuss possible influences - how artist get ideas

Engage:

Teacher will talk about the elements of art and principles of Design. Teacher will elaborate on the significance of composition in Art. If you divided your artwork into 4 parts and only looked at that section, would those lines in that section be interesting. Also, the teacher should remind the students that they do not have to be able to draw to do this lesson

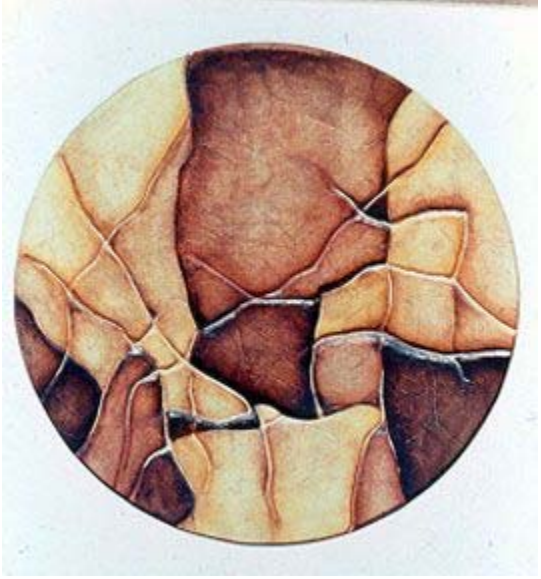
Explain:

1. By using a map as a guide, create a line drawing by tracing water or roads in a single line to form an interesting composition
2. Enlarge the idea on a canvas or board by using a transparency with an overhead or enlarge with a copy machine and glue onto canvas or board
3. Coil up paper towels and lay them in the areas for the roads using masking tape to make the lines thick and thin in different areas. Tape or glue the paper towels onto the lines
4. Cover the entire board with tissue paper and coat with glue. (paper mache mixture)
5. Let dry
6. Cover entire board with gesso.
7. Paint with acrylic paint using a color scheme, neutrals but make it very bright, more than you want.
8. Antique with black and brown oil paint. To do this you must paint the entire surface and then wipe it off with a rag.
9. When dry, spray board with Clear Acrylic Spray paint (glossy).
10. Look at examples of non-objective art. Critique. Speculate on inspiration-source of ideas
11. Critique student work.

Elaborate:

Have students write an art critique of their work using proper art vocabulary as well as standard art critique form.

EXAMPLES OF WORK



Evaluate:

Assessment: Modified Rubric (adapted from Marianne Galyk)

Assessment Rubric							
Student Name:						Class Period:	
Assignment:						Date Completed:	
Circle the number in pencil that best shows how well you feel that you completed that criterion for the assignment.	Excellent	Good	Average	Needs Improvement	Rate Yourself	Teacher's Rating	
Criteria 1 – Shows awareness of elements and principles of design in selecting composition	10 - 9	8 - 7	6 - 5 - 4	3 - 2 - 1			
Criteria 2 – Developed interesting relief 3-D surface	10 - 9	8 - 7	6 - 5 - 4	3 - 2 - 1			
Criteria 3 – Selected pleasing color plan and antiques to show surface variation	10 - 9	8 - 7	6 - 5 - 4	3 - 2 - 1			
Criteria 4 – Effort: took time to develop idea & complete project? (Didn't rush.) Good use of class time?	10 - 9	8 - 7	6 - 5 - 4	3 - 2 - 1			
Criteria 5 – Craftsmanship – Neat, clean & complete? Skillful use of the art tools & media?	10 - 9	8 - 7	6 - 5 - 4	3 - 2 - 1			
Total: 50 (possible points)	Grade:				Your Total	Teacher Total	

National Standards:

<p>1. Understanding and applying media, techniques, and processes</p>	<p>2. Using knowledge of structures and functions</p>	<p>3. Choosing and evaluating a range of subject matter, symbols, and ideas</p>	<p>4. Understanding the visual arts in relation to history and cultures</p>	<p>5. Reflecting upon and assessing the characteristics and merits of their work and the work of others</p>	<p>6. Making connections between visual arts and other disciplines (this can be brought in)</p>
<p>Students apply media, techniques, and processes with sufficient skill, confidence, and sensitivity that their intentions are carried out in their artworks</p>		<p>Students reflect on how artworks differ visually, spatially, temporally, and functionally, and describe how these are related to history and culture</p>	<p>Students differentiate among a variety of historical and cultural contexts in terms of characteristics and purposes of works of art</p>	<p>Students identify intentions of those creating artworks, explore the implications of various purposes, and justify their analyses of purposes in particular works</p>	<p>Students compare the materials, technologies, media, and processes of the visual arts with those of other arts disciplines as they are used in creation and types of analysis</p>
<p>Students conceive and create works of visual art that demonstrate an understanding of how the communication of their ideas relates to the media, techniques, and processes they use</p>	<p>Students evaluate the effectiveness of artworks in terms of organizational structures and functions</p>		<p>Students describe the function and explore the meaning of specific art objects within varied cultures, times, and places</p>	<p>Students describe meanings of artworks by analyzing how specific works are created and how they relate to historical and cultural contexts</p>	<p>Students compare characteristics of visual arts within a particular historical period or style with ideas, issues, or themes in the humanities or sciences</p>
	<p>Students create artworks that use organizational principles and functions to solve specific visual arts problems</p>			<p>Students reflect analytically on various interpretations as a means for understanding and evaluating works of visual art</p>	<p>(Note: Look at the examples of non-objective art - make connections to literature, music and world events when those works were created)</p>

OVERVIEW OF STATION 2: LOUISIANA'S WETLAND ECOLOGY

Louisiana is known around the world as the sportsman's paradise. There is a wide diversity of ecological features that give this name to Louisiana. One of Louisiana's primary Ecosystems is the Wetland Ecology. The wetlands of Louisiana can be found in the coastal areas along the Gulf of Mexico; associated with the Estuaries of Louisiana; in the Pearl River Watershed; in the Atchafalaya River and watershed; or in the Mississippi Alluvial Plain and associated with the Mississippi River Watershed. Of course there are many lakes, ponds, bayous, rivers and wetland features that are found all across the Louisiana Landscape.

At this station, Station 2 (See Figure 2, for station location), we want students to explore and discover, and compare and contrast a few wetland ecology attributes and types of wetlands found here in the Greater Baton Rouge landscape. Station 1 should be visited and observed first, so that a compare and contrast can occur between Station 1 and Station 2. Station 2 has been created as a storm water drainage area, however, you can observe many similarities between the

Mississippi River and Station 2. The drainage area has a meander and a floodplain, whereby the stream is defined and the overflow areas are adjacent to the stream. Most of the time the stream is slightly flowing. During a rain event, the surging storm water will spill over the channel and onto the floodplain. The top bank of the drainage area, has a natural levee, and any storm water will never



escape the levee. Trees and vegetation grow in the flood plains and filter any storm water as it travels down slope towards the stream. This vegetated area is called a wetland. Unique plants and animals inhabit the wetlands of Louisiana. The wetlands of Louisiana provide critical habitat for plants and animals, and protect humans from storms and filter water.

Lesson 1-Station 2

Wetlands Store and Release

Grades: 3-5

Objectives: By the end of this lesson, the students will be able to:

- Ask questions about objects in the environment
- Use magnifying lenses and graduated cylinders to observe and collect data
- Observe a wetland and some features and properties of wetlands
- Describe why wetlands are important

Materials:

- Large Cut Sponges
- Strips of Cardboard
- Hand Trowel (small shovel, gardening shovel)
- 2 empty bottles for water
- Aluminum tray
- Graduated cylinder
- Magnifying lenses
- Masking tape
- Petri dish

GLE's:

- Communicating that observations are made with one's senses, SI-E-A3
- Use the five senses to describe observations, SI-E-A3
- Employing equipment and tools to gather data and extend the sensory observations, SI-E-A4
- Measure and record length, temperature, mass, volume, and area in both metric system and U.S. system units, SI-E-A4
- Select and use developmentally appropriate equipment and tools (e.g., magnifying lenses, microscopes, graduated cylinders) and units of measurement to observe and collect data, SI-E-A4
- choosing appropriate equipment and tools to conduct an experiment, SI-E-B3
- Recognize that a variety of tools can be used to examine objects at different degrees of magnification (e.g., hand lens, microscope), SI-E-B3
- developing explanations by using observations and experiments, SI-E-B4
- identifying ways in which humans have altered their environment, both in positive and negative ways, SE-E-A3

- Describe how humans have had negative and positive effects on organisms and their environments, SE-E-A5

Engage:

Divide students into six groups. Make sure that each group has 2 empty bottles of water. Distribute materials from the materials list to each group. Have groups fill both bottles with water from the stream. Using their hand trowel, have group dig a small hole that is approximately 3” in diameter and three inches deep on the ground then pour approximately half of their bottle of water into the hole. Ask students what happened to the water? Ask students where do they think it went? Have groups discuss possible answers and record their observations in their Learning Journal.

Explore:

Have students poke a small hole, approximately the size of a pencil into one end of the bottom of the aluminum tray. Place a piece of masking tape over the hole on one end of the tray. To demonstrate how a wetland stores water, have each group pour 100 milliliters of water into the tray. Next place the sponge into the tray. After 5 minutes, have the group measure the remaining water in the tray, if there is any to collect. Instruct students to record the amount of water that is left. Have students write their findings in their Learning Journal. Discuss how the sponge is like wetland and absorbs water.

Instruct each group to remove the Petri dish from the materials set. Have them pour a small amount of unused water into their dish. Have students observe what they see in the water using a magnifying lens. Have them record their findings in their Learning Journal.

Explain:

Explain to the students that they have replicated the stream below. Ask: how has the appearance of water changed? How did it change? Did the amount of water change? Why? Why do you think it is important to have wetlands based on the activity they just did?

Elaborate:

Wetlands form in many places such as along rivers, lakes streams even highway ditches. Wetlands are areas where the soil is saturated most of the time. They have both aquatic and terrestrial habitats. The ability of the soil and surrounding plants to filter the water is a valuable reason for keeping wetlands.

Evaluate:

Discuss what they (the students) can do to protect the wetlands. Have them identify other wetlands around their home or school.

Lesson 2-Station 2

Erosion, Weathering and Sedimentation

Grades: 3-5

Objectives: By the end of this lesson, the students will be able to:

- Ask questions about objects and events in the environment
- Use observations to conduct simple investigations
- Define and identify erosion and weathering
- Describe how humans have had negative and positive effects on their environment

Materials:

- Spray bottle with water
- Aluminum tray
- Small bag of soil
- Toothpicks
- Learning Journal

GLE'S:

- Ask questions about objects and events in the environment (e.g., plants, rocks, storms) (SI-E-A1).
- Use observations to design and conduct simple investigations or experiments to answer testable questions (SI-E-A2).
- Predict and anticipate possible outcomes (SI-E-A2).
- Use the five senses to describe observations (SI-E-A3).
- Describe earth processes that have affected selected physical features in students' neighborhoods (e.g., rusting, weathering, erosion) (ESS-E-A1).
- Describe how humans have had negative and positive effects on organisms and their environments (SE-E-A3) (SE-E-A5).
- Describe how some plants and animals have adapted to their habitats (LS-E-C2).

Engage:

Walk around the site and ask students to find examples of erosion and weathering. Record their findings and discoveries in their Learning Journal.

Explore:

Have the students mound soil in the aluminum tray into a shape of a levee similar to what was observed while at Station 1. Ask students to predict what will happen when they gently

spray water from their water bottle onto the soil. Have students record their prediction in their Learning Journal. Spray soil with water bottle. Observe and record in their Learning Journal.

Next, ask students to predict what will happen when they pour the remaining water onto the soil. Have them record their prediction in their Learning Journal. Have students remove the lid off of the spray bottle and pour the remaining water onto the soil rapidly. Observe and record in their Learning Journal

Explain:

Have groups to share their results. Explain: Weathering is the gradual destruction of rock under surface conditions. Weathering can range from a change in color all the way to the complete breakdown of minerals. Weathering creates deposits of loosened material. Erosion means weathering plus transportation at the same time. Weathering is necessary for erosion, but a rock may weather without undergoing erosion.

Elaborate:

Have students record in their Learning Journal as they walk around the area and see if they can find other examples of weathering and erosion. Have them draw and label an example of each. Ask: Have humans made a positive impact on the area? Have humans made a negative impact on the area? How? Observe, discuss and record findings in Learning Journal.

Evaluate:

Have students brainstorm ways they can make a positive impact on this area. What could they do to slow down the erosion? When students return to school, have them write a letter to their legislator about ideas to help the erosion in Louisiana. Discuss and record in their Learning Journal.

Lesson 3-Station 2

Ecosystems Grades: 3-5

Objectives: By the end of this lesson, the students will be able to:

- Ask questions about objects in the environment
- Pose questions that can be answered by using students' own observations
- Select and use magnifying lenses, graduated cylinders to observe, record, and collect data
- Classify groups of organisms based on common characteristics
- Design an ecosystem that includes living (biotic) and nonliving (abiotic) components and illustrates interdependence

Materials:

- Hand lenses
- Ecosystem cards
- Pencil
- Learning Journal

GLE's:

- Ask questions about objects and events in the environment (e.g., plants, rocks, storms) (SI-E-A1).
- Pose questions that can be answered by using students' own observations, scientific knowledge, and testable scientific investigations (SI-E-A1).
- Use the five senses to describe observations (SI-E-A3).
- Select and use developmentally appropriate equipment and tools (e.g., magnifying lenses, microscopes, graduated cylinders) and units of measurement to observe and collect data (SI-E-A4).
- Explain and give examples of how scientific discoveries have affected society (SI-E-B6).
- Classify groups of organisms based on common characteristics (LS-E-A4).
- Compare organisms from different groups (e.g., birds with mammals, terrestrial plants with aquatic plants) (LS-E-A4).
- Design an ecosystem that includes living (biotic) and nonliving (abiotic) components and illustrates interdependence (SE-E-A1).
- Describe and explain food chains/webs and the directional flow of energy in various ecosystems (e.g., construct a model, drawing, diagram, graphic organizer) (SE-E-A2).
- Predict and describe consequences of the removal of one component in a balanced ecosystem (e.g. consumer, herbivores, and nonliving component) (SE-E-A2).

Engage:

Divide students into groups of six. Distribute kits. Instruct each group to walk around the area and make a list of biotic (living) and abiotic (nonliving) objects. Discuss how these objects work together to form an ecosystem.

Explore:

Instruct each group to find an ecosystem in the area they are walking. Make sure they use at least one object from each ecosystem card.

When students have completed their investigation, have students discuss how their ecosystem works. Have group record their findings in their Learning Journal and present their ideas to the rest of the class.

Explain:

Discuss the different objects that were found for each ecosystem card. For example: a plant might be an oak tree.

Discuss the basic needs for all animals: food, shelter, water, and a place to raise their young. How is this like the needs of plants?

Look at the site. Ask students:

- What would happen if all the trees were removed?
- How about if they just removed the dead trees?
- What kind of ecosystem would be lost if the dead trees were removed?
- If we killed all the mosquitoes how would this effect the ecosystem?

Elaborate:

Have student read the questions they wrote as a group on their Learning Journal worksheets. Work as a class to try to answer each question.

Evaluate:

Discuss what the students can do to have a positive impact on their environment. How do we negatively impact our environment?

Lesson 4-Station 2

Louisiana's Wetland Ecology

Grades: 6-8

Materials:

- Learning Journal,
- Pencils, Markers,
- Crayons,
- Colored pencils,
- Appendix H

Objectives:

- Students will observe the Mississippi River for abiotic (nonliving) and biotic (living) characteristics such as water clarity, current and flow, vegetation near banks of river, and shape.
- Students will compare and contrast findings at Station 1 (abiotic and biotic characteristics) with findings at Station 2.
- Based on observations, students will produce a map that will display a model of the general characteristics of the Mississippi River based on observation.

GLEs:

- Identify problems, factors, and questions that must be considered in a scientific investigation (SI-M-A1)
- Record observations using methods that complement investigations (e.g., journals, tables, charts) (SI-M-A3)
- Use consistency and precision in data collection, analysis, and reporting (SI-M-A3)
- Identify patterns in data to explain natural events (SI-M-A4)
- Develop models to illustrate or explain conclusions reached through investigation (SI-M-A5)
- Identify and explain the limitations of models used to represent the natural world (SI-M-A5)
- Communicate ideas in a variety of ways (e.g., symbols, illustrations, graphs, charts, spreadsheets, concept maps, oral and written reports, equations) (SI-M-A7) Use evidence to make inferences and predict trends (SI-M-A5)

Preparation before Lesson:

1. Divide students into groups of 4.
2. Assign each student in the group a job. By giving each name a job, students are learning new vocabulary regarding a variety of careers. See Appendix 3 for labels that each student in the group should wear throughout field trip.
 - **Cartographer** is the person in charge of the maps.
 - **Biologist** is the person in charge of identifying and observing the animals and plants in each specific area.
 - **Hydrologist** is the person in charge of identifying and observing the various water features.
 - **Project Manager** is the person in charge of supervising the project and keep everyone on task. This person will present the final product.

****Make sure to visit Station 1 located at the Visitor Center before visiting Station 2. Allow the students to make observations about the Mississippi River in their scientific journals while visiting Station 1.****

Engage:

Ask students to look back at the observations that made at Station 1 regarding abiotic and biotic characteristics of the Mississippi River. Discuss with students what they observed at the Mississippi River. Record their observations and discussion in their Learning Journal. Have students go beyond the water, and record all discussions in their Learning Journal.

Questions that could be asked:

- What did the water look like? (Clear, murky/muddy, etc.)
- How fast did the water appear to be flowing? (Identify something floating, such as a log, to estimate how fast or slow the water is moving.)
- How is the river water level at Baton Rouge impacted by events north of Baton Rouge?(ice melt, flooding in northern watershed, etc.)
- What vegetation did you see near and in the water? (trees, grass, lily pads, etc.)
- What is the shape of the river? (Straight, curvy, meanders, etc.)
- What keeps the water from flooding the campus? (levee and natural bluff)

Explore:

Have students walk around the site at Station 2 to make observations about land features, water features, plants, and animals, and record their observations and findings in their Learning Journal. Asks students to compare and contrast this site by taking note on how this site is similar and different from Station 1. These observations should be recorded in their Learning Journal.

Explain:

Have students draw a map with a complete legend of what they see at the site (see Appendix H for a sample map). A sketch can be done in their learning journal. See example there as well. Make sure students make notice of the main features of the topography. Students should show the water features, land features, as well as plants and animals (birds, mammals, etc.) located in this area. Provide colored pencils, markers, rulers, and crayons so they are able to distinguish by labeling each feature on a map key. Students should use entire sheet of 8 1/2 X 11 paper.

Elaborate:

Point out to students how the area mimics the Mississippi River. Have students share how the two are similar. (Meandering waterway, floodplain, several of trees along the banks, tributaries, the high and low water based on the rain, are just a few ways this area is like the Mississippi River, topographical features.)

Bring students to side where concrete wall is located. Point out to students where the floodplain is located, what would be considered a tributary?

Have students write these ideas down in their scientific journal. Students will use this page when they visit Station 2.

Evaluate:

Make sure to have students collect soil in three different areas. Collection should be done with the hand shovel and placed in baby jars. Have students label jars regarding where soil was taken (in a variety of places around the grounds such as: close proximity to water, on top of the bluff, on the edge of the lake). Make certain that the students collect soil only and not grass, or roots. This soil will be used back at the Pavilion area for an activity.

OVERVIEW OF STATION 3 – PAVILLION/URBAN FOREST

This area was selected to be a foundational part of the Southern University Educational and Interpretive Forest due to the site having a covered Pavilion, it has a park-like atmosphere, and it is located between the residential area of campus and the primary classroom section of the campus. This beautiful area provides wide open areas, with a sparse tree canopy. There is a riparian buffer zone which creates habitat for wildlife as well as provides a buffer against erosion and pollution from entering into the water way, which ultimately empties into the Mississippi River. There is a good mixture of biotic and abiotic elements at this station and this provides for a good understanding for students on how the abiotic and biotic elements work together in or urban ecosystem.

Station 3 we will focus on the Urban Forest (See Figure 2 for station location), measuring trees, distinguishing between things (proper identification of things), competition for resources in our Urban Forest, riparian zones and many other urban forest concepts and ideas.



Lesson 1-Station 3

Every Tree for Itself (Modified from Project Learning Tree 27)
Grades: 6-8

Materials:

- Colored Tiles (Poker chips may be used)
- Tree Cookies
- Paper Plate
- Pen, colored pencil or marker
- Timer

Objectives:

- Determine and understand the age of a tree by counting its annual rings
- Simulate how trees compete for their basic needs
- Describe how varying amounts of light, water, and nutrients affect the trees growth

GLEs:

- Use evidence and observations to explain and communicate the results of investigations (SI-M-A7)
- Use data and information gathered to develop an explanation of experimental results (SI-M-A4)
- Record observations using methods that complement investigations (e.g., journals, tables, charts) (SI-M-A3)
- Use consistency and precision in data collection, analysis, and reporting (SI-M-A3)
- Predict the impact changes in a species' population have on an ecosystem (LS-MC4)
- Describe changes that can occur in various ecosystems and relate the changes to the ability of an organism to survive (LS-M-D2)
- Describe and evaluate the impact of introducing nonnative species into an ecosystem (LS-M-D1)

Engage:

Hand out to each student a tree cookie. Asks student if they know what the rings on the tree cookie represent. Students may know that the rings represent the age of the tree. However, make sure students understand that the rings represent the age of the tree. Have students count the rings to determine how old the tree was that they are holding.

Explore:

Give students a large white paper plate or piece of paper to each student and a pen, colored pencil or a marker. Tell students to imagine they are trees. The plate will represent a cross section (or the stump) of the tree and students will draw the appropriate rings on the plate to represent their age.

Explain:

A forest has randomly scattered trees that vary in size, species and shape. Likewise, the roots of different trees also vary in size and ability to compete in certain situations and environmental constraints. Students will mimic the forest in this activity and gain an understanding of competition. Randomly place the student's trees out in an open area, with varied spacing between "trees". Have students stand on plate. Remind students that they represent trees in the urban forest. Remind students that they can sway, but that both feet must remain on their tree stump at all times during this plan. Have the students extend their arms out and up like a tree. Have the students point their face downward and close their eyes. While the students have their eyes closed, evenly distribute the colored tiles on the ground around the students. Explain that the students are going to play a game called "Every Tree for Itself". The object of the game is to gather as many tiles as they can. Explain that each color tile represents a tree requirement.

- Blue-water
- Green-Nutrients (Oxygen, Nitrogen, Carbon Dioxide)
- Yellow-Sunlight

Give a signal for students to use their roots and branches (arms and legs) to pick up as many tree requirements (color tiles) as they can without leaving their plate (tree) for 30 seconds. Remind them that they are not allowed to slide their cross section or step off it with both feet.

Have students record on their sheet how many of each tile they were able to acquire. Discuss these questions with the student?

- Is anyone missing a requirement? Did they not get blue tiles? How could this affect the tree?
- Did anyone get an abundance of a requirement? Is there such a thing as too much water, sunlight, or nutrients?

Have students stand on their cross-sections in groups of three to five. Spread tiles out again. Have students record their results.

Elaborate:

Discuss with students whether or not it was more difficult or easier to gather their requirements. Asks them if they can reach any conclusions about what happens when trees grow closer. (Such trees compete for requirements. Often they don't grow as well as trees that are more widely separated from one another.) Asks students if any trees "died" because they did not get the proper requirements.

In their Learning Journal, have students record what the colored tiles represented during this activity. Why is it important to have at least one of each kind at the end of the activity? Record your findings in your Learning Journal.

Evaluate:

Ask students how urban foresters might use their knowledge of competition in caring for a stand of trees? If trees are close together, will this impact their chances of survival? (Planting trees a certain distance apart so trees are able to get enough nutrients. The distance varies depending on the species of trees, as well as the age of the tree). Why would a Urban Forester carefully select species and spacing when planning an Urban Forest. Try this activity in a variety of ways (not as many water tiles, as sunlight and nutrients, etc. Discuss how foresters have to plan differently in an urban setting versus a rural setting. Record your findings in your Learning Journal.

Lesson 2-Station 3

The Ideal Filter (Modified from Youth Wetlands Week, The Idea Filter p.172-178)

Grades: 6-8

Materials:

- Learning Journal
- Empty, clean 2 liter drinking bottles(every student should have one)
- Coffee filters
- Several kinds of soil (clay, mud, gravel, sand)
- Dead leaves
- Fresh leaves and grass
- Other materials collected from nature
- Paper
- Permanent markers
- Plastic cups
- Add clay or mud to water and shake to make muddy water (teacher provides)

Objective:

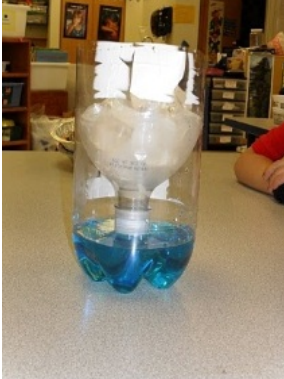
- Students will be able to understand that the primary function of a wetland is to act as a natural water filter, purifying dirty water, and protecting waterways from pollution.
- Students will understand that a wetland, by definition is a type of land feature that lies between dry land and water. It acts as a buffer zone that intercepts and filters polluted run-off before it can degrade rivers, lakes, and coastal areas.

Students will need a partner for this activity. Remind students about safety

GLEs

- Record observations using methods that complement investigations (e.g., journals, tables, charts) (SI-M-A3)
- Use evidence and observations to explain and communicate the results of investigations (SI-M-A7)
- Describe and compare the levels of organization of living things within an ecosystem (LS-M-C3)
- Differentiate between ecosystem components of habitat and niche (LS-M-C4)
- Predict the impact changes in a species' population have on an ecosystem (LS-MC4)
- Distinguish the essential roles played by biotic and abiotic components in various ecosystems (SE-M-A1)

- Describe the relationship between plant type and soil compatibility (SE-M-A9) Distinguish among several examples of erosion (e.g., stream bank, topsoil, coastal) and describe common preventive measures (SE-M-A10)



Advance Preparation:

1. Cut 2 liter bottles so that the top portion (1/3 of the bottle) can be placed upside down and inside of the bottom portion of the bottle. It should look like a funnel inside of the bottle.
2. If desired, collect fresh leaves and grass, and dried leaves, grass and soil from Station 2 activity. (Otherwise you can allow the students to do this during the activity.)

Engage (May be done in Pavilion Area near Bridge):

Ask students to imagine a wetland that is familiar to them. Have them share with a partner the features of that area and what they remember about the wetland. (Students may share that the area is a grassy marsh, cypress swamps, etc.) Answers may vary depending on students' experience. Ask students if they are aware of the function of a wetland? What does a wetland do for the environment?

Explore:

Have students get with their partner and explore the area between the Pavilion and the bridge. Students should record in their Learning Journal what they observe in the area as far as vegetation (tall grass, large trees), water (flow of water, how much water in stream, is stream curvy or straight, do they see pollution, etc.), animals, habitats, and observe and note abiotic and biotic relationships. Teachers will lead students across the bridge to make more observations and record in Learning Journal, as well. Have students return to picnic tables in Pavilion Area.

Explain:

Have students share what they observed- making sure to point out how the area around the creek would be considered a wetland. Asks students what they believe to be the benefits and functions of a wetland.

Tell students that today we are going to get in groups of four and simulate the filtering of a wetland. Each group will be given the opportunity to create a filter using the 2-liter

bottle and natural materials from the ground. Students will need to make sure the top of the bottle that was removed is turned upside down and placed in the top. (See picture)

This filter's purpose will be to reduce the mud and pollutants from a sample of muddy water. Hold up jar of muddy water. Provide students with coffee filters, gravel, sand, soil around existing area, dead and fresh leaves, as well as dead and fresh grass. Allow students approximately 15-20 minutes to create a wetland filter using materials provided.

Elaborate:

Have each group place their bottle in the center of the picnic table. Teacher will pour muddy water into the top of each group's bottle. Students should observe the water drained through the filter. Asks students to vote on which water was the cleanest. They should look for sediment left at the bottom of the bottle and overall cloudiness of the water. Asks the group that was considered to have the cleanest water to share what they used as a filter in the top of their bottle. Point out to students how wetlands help naturally purify for the environment-from clean water for the animals to preventing erosion and flooding.

Evaluate:

Asks students to complete questions on the sheet attached once it is determined what filter worked the best.

- What are the benefits that wetlands offer to people?
- How do wetlands act as natural filters?
- If wetlands were damaged or destroyed, what would our waterways look like?
- Why would this be important to the fishing industry in Louisiana?
- If there were more filters in an area, would this help purify the water better?

Lesson 3-Station 3

Measuring Tree Height and Diameter

Grades: 6-8

Objectives:

- Student will be able to take multiple measurements of a tree while in the urban forest.
- Students will be able to conduct scientific measurements of trees using a variety of industry specific tools.
- Students will be able to understand the benefits trees provide for the environment such as carbon sequestration, carbon storage, environmental benefits of trees, etc.

GLE:

- Identify problems, factors, and questions that must be considered in a scientific investigation (SI-M-A1)
- Use a variety of sources to answer questions (SI-M-A1)
- Select and use appropriate equipment, technology, tools, and metric system units of measurement to make observations (SI-M-A3)
- Record observations using methods that complement investigations (e.g., journals, tables, charts) (SI-M-A3)
- Use consistency and precision in data collection, analysis, and reporting (SI-M-A3)
- Write clear, step-by-step instructions that others can follow to carry out procedures or conduct investigations (SI-M-A7)
- Distinguish between *observations* and *inferences* (SI-M-A7)
- Use evidence and observations to explain and communicate the results of investigations (SI-M-A7)
- Use relevant safety procedures and equipment to conduct scientific investigations (SI-M-A8)

Materials:

- Yardstick
- Learning Journal
- Pencil
- D-Tape
- Tangent Height Gauge
- Pin flag
- 100-foot measuring tape

Vocabulary

- **trunk**-the woody portion of a tree beginning at the roots from which all stems originate
- **Diameter at breast height (DBH)**-common measurements among foresters and urban foresters taken at 4.5 feet above the ground
- **tree crown**-the top part of the tree which features stems, twigs, and leaves
- **total height**-measurements of a tree from the root flare to the tip of the tree crown
- **ground to crown height**-the distance between the root flare and the lowest portion of the crown
- **crown spread**-the distance the branches spread away from the trunk

Engage:

Teacher will remind students about how to find the age of a tree. (Counting the rings on the inside of the tree) Teacher will ask students if they know how to measure the height of the tree or what tool would one use to measure the diameter of the tree? State that today students are going to be learning how to find the height, without using a ladder, the diameter of the tree, and the average crown spread of a tree.

Explain:

Teacher Model

Explore: (Student Repeats)

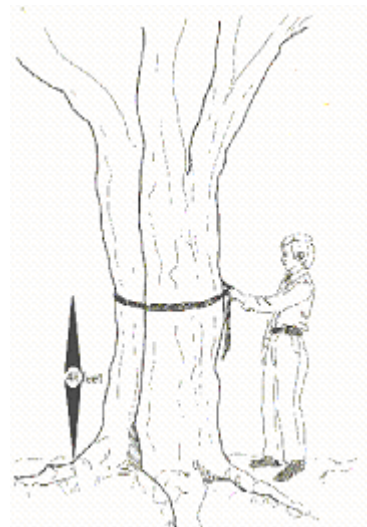
The teacher will choose a tree to model the activity each time before students receive materials. Teacher will need an assistant to model each measurement.

How to find the diameter of a tree

Teacher Models

- The diameter of a tree is taken at 4.5 feet (breast height) above ground.
- Measure from the ground up the trunk to 4.5 feet. Have one person hold their hand in this location.
- At this location, a person measures the tree diameter at 4.5 feet with their diameter tape (D-tape) by wrapping the D-tape around the trunk at 4.5 feet.

Have students get into pairs with their journals and



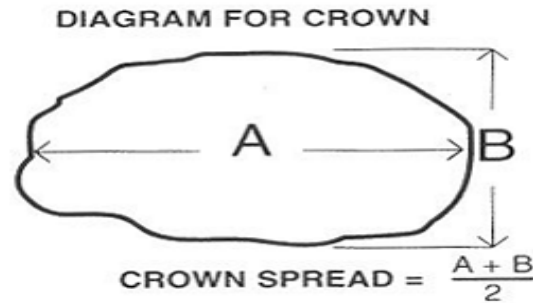
make sure to have a pencil. Each pair will need a yard stick, 100-foot measuring tape, diameter tape (D-Tape), Learning Journal with pencil.

The teacher will assign a tree to each pair. Students are then sent to a specific tree and repeat the steps the teacher modeled to find the diameter of their tree.

How to find the crown spread of a tree

Teacher Models

- A tree's crown is not uniform in shape. Therefore, we are going to take two measurements and take the average between the two measurements found to find the crown's spread.
- Imagine the tree's crown is circular in shape. The goal of this activity is to find four points that are equal distance apart.
- Find the furthest outreaching limb and leaves of your target tree. Place a pin flag (See picture above)
- Have your partner walk directly away from you (where you have placed the pin flag) in a horizontal fashion passing close by the trunk. Another pin flag should be placed at the furthest limb and leaves directly across from the first flag placed.
- With 100 foot tape, measure from one pin to the other. (Your tape should be touching the tree trunk.) Keep pin flags in the ground.
- You have just completed line segment A in the diagram above.
- Repeat these steps to complete line segment B in the diagram above. You should have four pin flags around the outer edge of the crown which should divide crown into four equal parts.
- After finding both measurements, add the two together and divide that number by 2.
$$\frac{A + B}{2} = \text{Average Crown Spread}$$



Have students get into pairs with their Learning Journals and make sure to have a pencil. Each pair will need a 100-foot measuring tape, pin flags, and Learning Journal with pencil.

The teacher will assign a tree to each pair. Students are then sent to a specific tree and repeat the steps the teacher modeled to find the average crown of their tree.

How to find the total height of a tree

Teacher Models

- Take the measurement of the person who will use the tangent height gauge. This measurement should be taken from their eyes to the ground. This measurement equals H (height of person eye to ground).
- Note: when taking all measurement make sure to stay in same unit of measurement and always round up to the nearest inch.
- Using the tangent height gauge, one person will walk away from the tree aligning the top site on the tangent height gauge to see the top of the tree.
- The partner will ensure that the bubble level on the tangent height gauge is level. Once the top of the tree is seen in site and the level bubble is centered, have the partner place a pin flag in the ground at that point.
- Now with the 100-foot tape, measure the distance from the pin flag to the tree. This measurement will be referred to as D (distance).
- By adding the height (H) and distance measurement (D), this will equal the height of the tree. **$D + H = \text{Total Height of Tree}$**



****Steps can be found on the side of the Tangent Height Gauge****

Have students get into pairs with their Learning Journals and make sure to have a pencil. Each pair will need a 100-foot measuring tape, pin flags, and Learning Journal with pencil.

The teacher will assign a tree to each pair. Students are then sent to a specific tree and repeat the steps the teacher modeled to find the average crown of their tree.

Elaborate:

Have students write in their journal about which one of the activities they found to be the hardest. Which activity they found to be the easiest? Why would this be important to a forester or urban forester?

Evaluate:

Once the students have completed all three measurement activities for a tree, have the student pairs rotate to a new tree and repeat the three measurements of a second tree

(teacher may elect to adjust pairings). After each student pair has completed the measurement activity at two selected trees, bring the class together for an informal discussion on the activity. Have students return all equipment to the appropriate Station bins. Gather with the entire class. Recount the process of taking measurements of a tree's diameter. Teacher will want to point out to students by compare and contrast, that the D-Tape takes measurements in diameter of circle, while a measuring tape takes measurements in linear feet (notice the increments on the D-Tape are not inches, but measures of Pi, while the measure tape is in standard units). Looking at the Average Crown Spread, ask students, why we needed to get two measures of the crown spread. Explain that trees do not have perfect circular crowns, so we need two measures to get the average. Looking at the Total Height activity, ask students about the measuring device, the Tangent Hand Tool. Was this an easy tool to use?

Have students take notes on this evaluation activity in their Learning Journal, in a neat and orderly fashion, so they can compare to other groups or explain in group discussion after the completion of the field activities.

Lesson 4-Station 3

Wildlife Habitat and Ecology-Dichotomous Key

Grades: 3-5 or 6-8

GLE: LS-M-C1; LS-M-C4

Materials:

- Learning Journals
- Pencil

Engage:

Teacher will ask students to record physical and structural differences and similarities between living organisms. Students may record answers on Student Activity Sheet for Dichotomous Key Activity (Learning Journal). Have students share answers with the rest of the class. This should be an open discussion with reasoning behind why they chose these similarities and differences in their group. Teacher may point out differences such as fur or feathers, skin or scale, four legs or two legs, etc.

Explain:

Teacher will explain that organisms are grouped into categories based on similar characteristics. For example, mammals all have fur or hair unlike amphibians that all have moistened skin, or reptiles that tend to have scales or coarse skin. The unique characteristics and adaptations of animals determine where they live. Critical habitat for any wildlife animal fits the needs of that specific animal. As a scientist, identifying and classifying animals is critical in further understanding the animal or the habitat. All scientists use a dichotomous key to aid them in identifying animals and plants that they observe.

Explore:

Teacher will do example with candy first. Teacher will explain to students that while each of these pictures is candy, each one has unique characteristics. Teacher will explain that these pictures are highly recognizable and the name of the candy is on the packaging. This is not typical. Scientists must identify by characteristics, not by branded names. Have students begin with Skittles. Read statement 1a., “Candy is chocolate.” Since Skittles are not chocolate, proceed to 1b. Since this statement meets the requirements, proceed to 3a and so on through statements. These steps must be done for each candy.

Students will work in groups of four to complete this lesson.

Elaborate:

Explain to students that a dichotomous key is a tool that scientist use to determine species. Scientist examine the feature and characteristics of a living object, and through a series of questions and the process of elimination are able to determine the species and properly identify the species that they are studying.

Evaluate:

Have students observe the various trees out at Station 3, by walking the site in small groups of two-four students. Point out that there are many different trees, animals and plants that live in the area, but that they are all unique can all have unique features. Have students return to the covered Pavilion Area. With their Learning Journal, have groups complete the activity.

Teacher models with students the dichotomous key example using candy. Students will need to have all.

Example:



- 1a. Candy is chocolate.....go to 2
- 1b. Candy is not chocolate but fruity.....go to 3

- 2a. Candy has peanuts and caramel.....**Snickers**
- 2b. Candy has chocolate covered wafers.....**KitKat**

- 3a. Candy has colored coating and hard shell.....**Skittles**
- 3b. Candy has smooth covering and is bean shaped.....**Jelly Beans**

Guided Practice In this teacher guided activity, students will be able to identify the pet



- 1a. Animal has fur.....go to 2
- 1b. Animal does not have fur.....go to 4

- 2a. Animal is carnivorous (eats meat)..... go to 5
- 2b. Animal is herbivorous (eats plants).....**GUINEA PIG**

- 3a. Animal has pointed ears that stand up.....**CAT**
- 3b. Animal has soft, floppy ears that hang to sides.....**DOG**

- 4a. Animal has feathers.....**BIRD**
- 4b. Animal does not have feathers.....**FISH**

Independent/Partner Practice (Pictures numbered 3-10)

- 1a. Bird has blue, green or red feathers.....go to 2
- 1b. Bird has no blue, green or red feathers.....go to 3

- 2a. Bird has blue feathers.....go to 4
- 2b. Bird has green or red feathers.....go to 5

- 3a. Bird has long slender beak.....go to 7
- 3b. Bird has s thick, stout beak.....**HOUSE SPARROW**

- 4a. Bird has orange and white chest feathers.....**EASTERN BLUEBIRD**
- 4b. Bird has blue and white feathers with black markings near head.....**BLUE JAY**

- 5a. Bird has red and green spots, and long slender beak.....**HUMMINGBIRD**
- 5b. Bird has red feathers.....go to 6

- 6a. Bird has red and white chest feathers.....**RED-HEADED WOODPECKER**
- 6b. Bird is nearly entirely red, with black on face and red beak.....**CARDINAL**

- 7a. Bird has dark spots on wings and a blue circle around eyes.....**MOURNING DOVE**
- 7b. Bird has light brown feathers and a white chest.....**MOCKING BIRD**

Outdoor Tree Exercise

- 1a. Tree has broad leaves.....go to 2
- 1b. Tree has needles-like leaves.....go to 3

- 2a. Tree is deciduous (Changes colors in fall).....go to 4
- 2b. Tree is evergreen (doesn't change color in fall).....go to 3

- 3a. Tree has needle-like leaves.....**LOBLOLLY PINE**
- 3b. Tree needles that are feather-like.....**BALD CYPRESS**

- 4a. Leaves are one basic shape.....go to 5
- 4b. Leaves are various shape on same tree.....**SASSAFRAS**

- 5a. Leaves have three main veins.....**AMERICAN SYCAMORE**
- 5b. Leaves have one main central vein.....go to 6

- 6a. Leaves with smooth rounded lobes.....**WHITE OAKS**
- 6b. Leaves smooth, but unlobed.....go to 7

- 7a. Leaves with 9-17 sub-leaflets, produce a sweet edible nut.....**SWEET PECAN**
- 7b. Leaf undersurface is smooth, without hairs.....**WATER OAK**

Tree #1: _____ **Tree #2:** _____

Tree #3: _____ **Tree #4:** _____

Tree #5: _____

Lesson 5-Station 3

Tree Detectives

Grades: 3-5

Objectives: By the end of this lesson, the students will be able to:

- Observe and record observations
- Combine information, data, and knowledge to reach a conclusion or make a prediction
- Describe how plant structures enable the plant to meet its basic needs
- Describe how some plants have adapted to their habitats

Materials:

- Worksheets
- Clipboards
- Pencils
- Colored pencils

GLE's:

- Ask questions about objects and events in the environment (e.g., plants, rocks, storms) (SI-E-A1).
- Use the five senses to describe observations (SI-E-A3).
- Record observations using methods that complement investigations (e.g., journals, tables, charts) (SI-M-A3).
- Combine information, data, and knowledge from one or more of the science content areas to reach a conclusion or make a prediction (SI-E-A5).
- Compare structures (e.g., roots, leaves, stems, flowers, seeds) and their functions in a variety of plants (LS-E-A3).
- Describe how plant structures enable the plant to meet its basic needs (LS-E-A3).
- Explain how some organisms in a given habitat compete for the same resources (LS-E-C1).
- Describe how some plants and animals have adapted to their habitats (LS-E-C2)

Engage:

Instruct students to walk around the area and look at the variety of trees. Encourage them to note similarities and differences. After 10 minutes, gather students into class group and discuss what they observe. Have students write their observations and discussions in their Learning Journal.

Explore:

Instruct students to walk the Pavilion Area and identify two different trees. Have them fill out the graphic organizer, found on the next page. Compare the two trees looking for similarities and differences. Have students complete the Learning Journal questions and sketch the trees in their Journal.

From their two different trees have students collect leaves and bring the leaves back to the picnic area for closer observation. Have them fill out the graphic organizer and compare the leaves. Instruct students to sketch the leaves in their Learning Journal.

Explain:

Explain to the students that there are two different types of trees, evergreen and deciduous. A tree that is classified as an evergreen tree, is a tree with leaves or needles that remain on the tree all year. The tree remains green all season, even in the winter. An example would be a Southern Magnolia and Loblolly Pine.

A tree that is classified as a deciduous tree is a tree that sheds its leaves every fall, as the tree enters dormancy. An example of this type of tree is a Yellow-Poplar or a Red Maple.

Discuss the trees that the students observed while at the Pavilion Area. How are the trees similar? Ask: What do they all need to survive?

What are they doing to compete for the same space?

What would happen if two trees were growing so close that their limbs and branches were touching?

Do you think trees grow better in the sunlight or in the shade?

Elaborate:

Have students look at the area around the trees. Discuss what it looks like. What is growing around the tree?

How have these plants adapted to this habitat?

As a class, walk the students over the bridge located at the Pavilion Area. Inform the students that the area of land near the edge of the stream/bayou is called the riparian zone. The riparian zone is very diverse with many species of trees, bushes, and plants. The riparian zone can be a preferred habitat for many wildlife species. This area meets all of the basic requirements for wildlife; food, water and shelter. Equally as critical, the riparian zone acts as a filter from storm water the flows from the Pavilion Area towards

the natural bayou. As storm water moved through the riparian zone, it slows down, which allows the water to be absorbed by the plants in the riparian zone. Also, any debris or sediment can be trapped and held by the riparian zone, keeping pollution out of the stream and our water ways.

Evaluate:

Look for an area near the riparian zone where the trees have been removed. What will happen to the water in the area? Why should we keep these areas? Observations from the bridge may look similar to the pictures below.

1-Drainage improvements on Southern University's Campus



2- Riparian Zone-Natural Bayou on Southern's Campus



SOUTHERN UNIVERSTIY EDUCATIONAL AND INTERPRETIVE FOREST FUTURE CONSIDERATIONS TO IMPROVE THE EDUCATIONAL EXPERIENCE

1. **Amphitheater** – An amphitheater is basically an outdoor theater, usually oval or circular, set aside in the Southern Educational and Interpretive Forest with seats facing an outdoor stage or raised area. The area can be used as a gathering place or teaching area for the students and teachers.
2. **Arboretum** – An arboretum is an area of woods where different specimen trees are established or planted. The area can be mowed with maintained walking trails throughout the arboretum or allowed to grow up into various successional stages. Each tree in the area should be marked with its common and scientific name, uses and characteristics.
3. **Archaeological Area** – An area set aside for students to learn about archaeology as well as the tools and techniques associated with this field of science is fun and exciting for the students. Inside the “archaeological dig,” students will search and excavate historical artifacts (some may be real and others reproductions) that represent a broad range of human history or a specific time period. The students will learn that there is a story connected to every artifact, regardless of its age. The site also may be used as an area to study soils and geological history.
4. **Berry-Producing Shrubs** – Berry-producing shrubs provide a wonderful display of color through foliage, flowers and fruit. Producers such as blueberry, flowering dogwood, and crabapple help attract many different types of wildlife into the Southern Educational and Interpretive Forest. Normally they grow quickly and can help slow soil erosion.
5. **Bird Blind** – A bird blind is simply a boxed frame made of wood or metal with wire woven around it. Branches with leaves and other natural vegetation are then laced across the wire to provide a sense of camouflage. The blind is placed near feeders or at the edge of brushy areas with a hole or viewing area left clear. Bird noises can be mimicked through human calls or audiotapes.
6. **Bird Feeder and Baths** – Bird feeders and baths provide excellent food and water sources for many different species of birds. Be sure to offer a variety of bird feed (such as sunflowers seeds, safflower, suet, etc.) to attract a wide variety of birds. Also, keep at least one birdbath available as birdbaths can attract more birds than any feeder.
7. **Butterfly Garden** – A butterfly garden that contains colorful flowers is a great way to attract these vibrant insects to the Southern Educational and Interpretive Forest. When selecting plants for the butterfly garden, you will want to provide nectar producing plants like butterfly weed, zinnias, lantana, and purple coneflower as well as host plants for the caterpillars such as passion vine and milkweed so that students can witness the life cycle of a butterfly first-hand.
8. **Compost Stations** – All Southern Educational and Interpretive Forests with a vegetable garden or horticultural plot should consider adding a compost pile. A compost bin can be constructed or purchased relatively inexpensively. Grass clippings, leaves, table scraps and other debris placed in the bins can turn into some very rich topsoil in a short period of time. Avoid including fats, meats and other proteins as they will attract rodents.

9. **Early Successional Habitat Study Area** – Simply stop mowing an area and see what grows there. Within a season, native grasses and wildflowers can create a rich habitat for small wildlife. A mowed trail through the meadow will bring the lessons up close. Note: If you have a lot of non-native, invasive plants in your early successional habitat area, contact your local Louisiana Cooperative Extension Agent to learn what measures you can take to eliminate your non-native invasive species so that your local natives can thrive.
10. **Erosion Control Demonstration Area** – Select a site in the Southern Educational and Interpretive Forest to set up an erosion control area to help demonstrate how erosion affects the soil. Select an area with approximately 5 percent slope and about 15 feet wide. Remove all existing grass and vegetation in this area until bare ground is exposed. Next, split the section of ground into three equal parts. The first section should be left alone, the second section should be covered with large stone or rip rap and the last section should be sown in rye grass or a similar plant. Place a collection container at the downhill end of each section and use it to collect and measure the amount of sediment that washes off after a rainfall or planned flood.
11. **Urban and Community Garden Plot** – Everyone should experience planting and managing a garden at some point in his or her life. The garden plot can be as small or as large as desired. Remember that many young people are not in school during the summer months which are the primary growing and harvesting time for many warm-season garden crops. When planting a garden, consider planting fruits and vegetables that do not require constant care and that can be harvested and enjoyed during the school year, such as cool-season fruits and vegetables like pumpkins, collards and broccoli. Figs, blueberries, some pear varieties, and other various citrus trees work well in the Baton Rouge area.
12. **Groundwater Monitoring Hole** – To construct a groundwater monitoring hole, dig a hole that is 4 to 6 inches in diameter and 4 to 5 feet deep with an auger or post-hole digger. Place a piece of PVC pipe that is about the same diameter as the hole and 1 foot longer (with many holes drilled along the entire pipe) in the hole. Keep it straight up and down and pack dirt around it to secure it in place. Use a dry wooden stick that is longer than the hole is deep to determine how much of the hole is filled with water by lowering it until the end touches the bottom and then measuring how much of the stick is wet. Monitor this hole over a period of time, especially during a wet or dry spell to see how the water level in the pipe changes. When not in use, the pipe end should be covered with an end cap.
13. **Insect Traps** – Students could become amateur entomologists through the study of insects that they collect using different types of insect traps. The traps may be constructed by the students or purchased. Each trap may vary in design, size, and whether it uses an attractant or not – depending on the insects you are trying to attract and trap.
14. **Log Decomposition** – Place a recently fallen or cut log (at least 12 inches in diameter) on the ground in your Southern Educational and Interpretive Forest and allow the local decomposers (such as worms and pill bugs/rollie-pollies) to begin their work. After allowing the log to sit for a few months, just roll the log over so the students can see the decomposers at work.
15. **Native Grasses and Wildflower Plot(s)** – The addition of native grasses and wildflowers will add to the natural diversity and appearance of the Southern Educational

and Interpretive Forest area. Research the local area to see what grasses and wildflowers are native and how the plants or seeds can be obtained. Many seed companies will donate seeds at the end of the season. The seeds can be kept and planted the next season, even though they might have a decreased germination rate. Native grasses are oftentimes readily available in the seed bank and may only require a controlled burn or tillage of the soil to get them started. Native grasses and wildflowers are attractive at the entrance of the classroom, near signs or along trails and walkways. These native grasses and wildflowers are also very beneficial to wildlife.

16. **Nesting/Roosting Boxes** – Properly designed and placed nesting boxes can be added to the outdoor facility to attract different types of wildlife. The boxes can be designed for songbirds, wood ducks, bats, owls, squirrels and other small mammals. The boxes can be easily designed with standard woodworking tools or purchased at retail stores. A technology/vocational class could also construct them as a class assignment.
17. **Outdoor Seating Area** – Ample seating areas in the Southern Educational and Interpretive Forest are very important. The seats can be as simple as benches made from a 2 inch x 6 inch x 4 feet treated board attached to 4 inch x 4 inch posts. Arranging some picnic tables under a shelter so that students can have a place to meet, write or observe would be helpful as well.
18. **Rain Barrels** – Rain barrels are used to collect or harvest rainwater for use during drier months or as an alternative to your potable water supply. Harvesting rainwater can save money and provide a natural source of water for outdoor plants. Depending on the size of your roof and the amount of rainfall in your area, you can collect a substantial amount of rainwater (.62 gallons per square foot per inch of rain) with a simple rainwater harvesting system such as a rain barrel attached to the Southern University downspouts near the Southern Educational and Interpretive Forest area.
19. **Reforestation Project** – Plant native tree saplings in part of a meadow or field at or near the Southern Educational and Interpretive Forest area. Be sure to mulch around the new saplings and throughout the newly “forested” area, and erect a barrier around the area to protect the trees and keep mowers out of the area until the trees are much larger.
20. **Time Capsule** – A time capsule can be a grand opportunity to record history and might be a fun venture for students. Current environmental and natural resource issues, news articles or photographs could be buried in a designated area in the Southern Educational and Interpretive Forest using a water- or rust-proof container placed in a secure area. Have a future date selected on which the time capsule will be dug up.
21. **Trails** – Design and develop a trail for your Southern Educational and Interpretive Forest site to lead students from one learning station to another. Consider erosion control, placement of culverts, and selection of trail cover (gravel, mulch or other material) to make it maintenance free and wheelchair accessible. Consult your local LSU Ag. Extension agent or NRCS Soil & Water Conservation agent for technical assistance.
22. **Trees and Woodlands** – Make use of a pre-existing wooded area or establish a woodland plot or tree trail for tree identification, wildlife habitat and forestry management activities. Site and species selection are important as you want to make sure the two are compatible,
23. **Wildlife Brush Piles** – Brush piles are easy to establish and will help attract wildlife by providing hiding, nesting and resting cover for many species of birds, reptiles and small mammals. Simply place woody materials such as tree branches in piles in the corners of

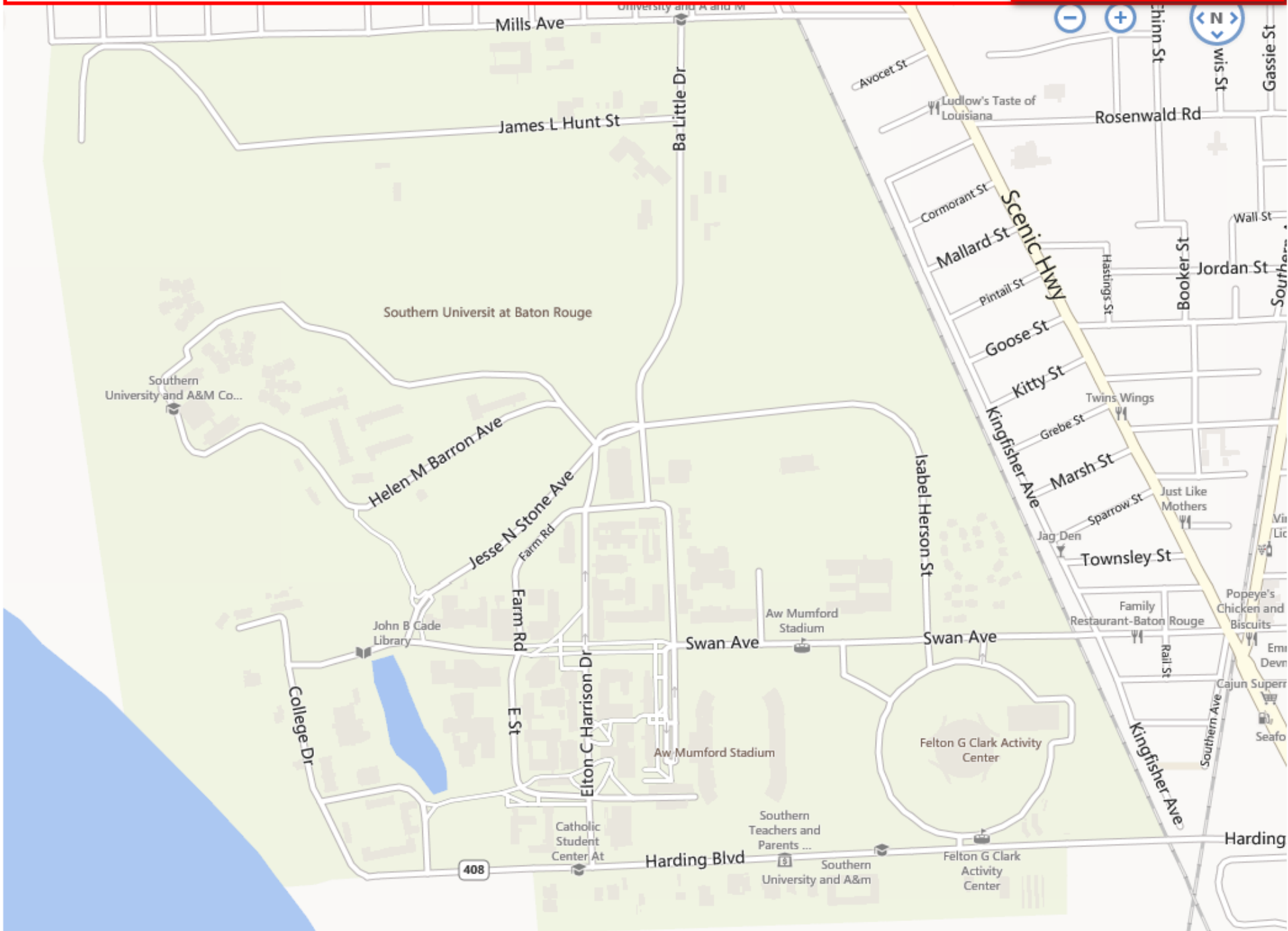
your Southern Educational and Interpretive Forest area. Brush piles will slowly decay so you will want to keep adding to existing piles or create new ones each year.

24. **Wildlife Food Plots** – Food plots including plants such as corn, sunflowers, clovers, and soybeans can provide extra food and cover for wildlife. Proper fertilization and liming are often required, so be sure to contact your local LSU Ag. Extension agent for assistance with soil samples and other wildlife food plot establishment recommendations.

**Figure 4 will show potential future development sites near the Southern Educational and Interpretive Forest area.

FIGURES

APPENDICIES





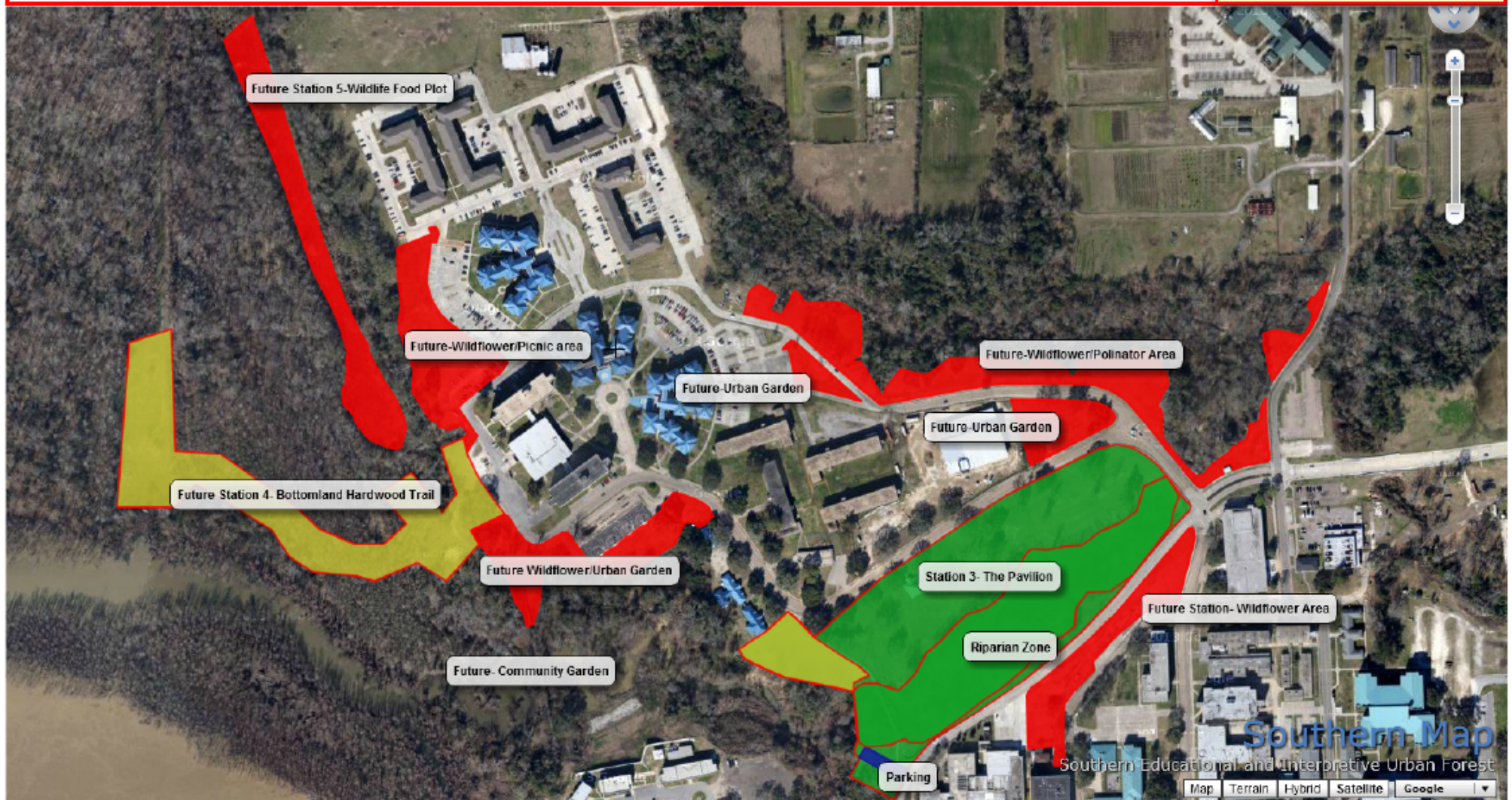
Medical Facility on the Southern University Campus

FIGURE 3



Future Station Development

Figure 4



Field Trip Permission Form



Your child's class will be taking a field trip to:
**The Southern University Educational
 and Interpretive Forest**



Approximate No. of Chaperones: _____

Location: _____

Mode of Transportation _____

When **Day** _____ **Date** _____

Time **Leave school** _____ **Return by** _____

Cost \$ _____ *Exact cash or check payable to school*

Additional Information _____

(Additional information may include phone number where parents can reach their child in case of an emergency at home, overnight accommodations, anticipated arrival time at the event site, etc.)

Important: Please keep the top portion of this field trip permission form for your records.

✂ CUT HERE ----- ✂ CUT HERE ----- ✂ CUT HERE ----- ✂ CUT HERE ----- ✂ CUT HERE

Please return this portion of the field trip permission form to Mr./Mrs./Ms. _____

Please return permission slip to your child's teacher by _____

I give my child, _____ in Room _____

permission to attend the field trip to _____

on _____ from _____ to _____.

I enclose \$ _____ *(Exact cash or check payable to school)* to cover the cost of the trip.

I give permission for my child to receive emergency medical treatment. In case of emergency, please contact

	Name	Phone Number
1.		
2.		
3.		

My child has special dietary or medical needs such as: _____

My child and I are familiar with the Southern University Educational and Interpretive Forest Code of Ethics and are in agreement that he/she will abide by all rules and regulations while attending this school function.

Parent's/Guardian's Signature _____ Date _____

Parents are welcome and encouraged to participate in field trip activities.

Parent chaperones may or may not be necessary for this trip. Please indicate your willingness to assist.

If your assistance is needed, the school will contact you.

Yes, I am available to serve as a chaperone. I can be reached at _____.

LEARNING JOURNAL



Grades 3-5

LESSON 1 STATION 1

- Create different forms of poetry (diamante, cinquain, free verse, haiku)
- Understand figurative language, word relationships, and word meanings

Write nouns (WORDS THAT ARE A PERSON, PLACE, OR THING) that come to your mind when observing the outdoors.

Write adjectives (WORDS THAT DESCRIBE A NOUN) that come to your mind when observing the outdoors:

Write verbs (AN ACTION) that come to your mind when observing the outdoors:



LESSON 1 STATION 1

Diamante- Rules for Diamante

Noun

Adjective, adjective

Verb, Verb, Verb

Noun, Noun, Noun, Noun

Verb, Verb, Verb

Adjective, Adjective

Noun

Cinquain-Rules for Cinquain

Line 1: Title

Line 2: Description of the title in 4 syllables(or words)

Line 3: Description of action in 6 syllables(or words)

Line 4: Description of a feeling in 8 syllables(or words)

Line 5: Another word for the title in 2 syllables(or words)

LEARNING JOURNAL



Grades 3-5

LESSON 2 STATION 1

- Realize the importance of the Mississippi River as a means of transportation in the past and present
- Identify the relationship between the Mississippi River and the location of cities
- Identify the importance of water as a need for our bodies and as a source for transportation and living
- Identify landmarks such as the State Capital, old and new Mississippi River bridges
- Realize the importance of rivers and bridges to commerce
- Identify a natural levee and the need for levees
- Identify and explain ways in which people in Louisiana modify the physical environment to meet basic need

Sketch or write what you see on the Mississippi River that is biotic (living) and abiotic (nonliving).

BIOTIC (Living)

ABIOTIC(nonliving)

Using the tray, work with your partners in your group to make a model of what you see at the Mississippi River.

Brown clay= levee

Blue clay= water

Green clay=plant life (trees, grass, bushes)

Yellow clay=industry, boats, barges

How would the model have to change to adapt to meet human needs?

LEARNING JOURNAL



Grades 3-5

LESSON 1 STATION 2

- Asks questions about objects in the environment
- Use magnifying lenses and graduated cylinders to observe and collect data
- Create a wetland
- Describe why wetlands are important

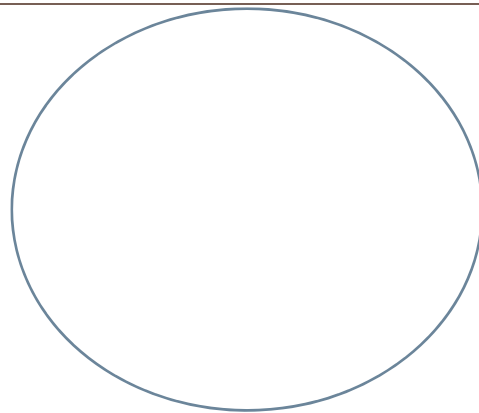
Tell your thoughts are about what happened once water is poured into the hole.

Place the sponge in tray, cover the hole in tray with tape, pour 100 mL of water into tray, and then observe how much remains after hole has been uncovered.

After the 100 ml is poured into the tray with sponge, record how much remains after 5 minutes.

Draw what you see in Petri dish with magnifying glass

Use adjectives to describe what you see



Tell what you can do to help protect the wetlands in your area.

LEARNING JOURNAL



Grades 3-5

LESSON 2 STATION 2

- Ask questions about objects and events in their environment
- Use observations to conduct simple investigations
- Define and identify erosion and weathering
- Describe how humans have had a negative and positive effects on their environment

Make a prediction about what will happen when water is gently sprayed on soil in tray.

Record what actually happened when water was sprayed on soil.

Make a prediction about what will happen when water is poured on soil in tray.

Record what actually happened when water was sprayed on soil.

Examples of Weathering

Examples of Erosion

LEARNING JOURNAL



Grades 3-5

LESSON 3 STATION 2

- Ask questions about objects in the environment
- Pose questions that can be answered by using students own observations
- Select and use magnifying lenses and graduated cylinders to observe, record and collect data
- Classify groups of organisms based on common characteristics
- Design an ecosystem that includes living(biotic) and nonliving(abiatic) components and illustrates interdependence

LIST OF ABIOTIC (Nonliving)

LIST OF BIOTIC (Living)

1.

2.

3.

4.

5.

What objects in your lists work together to create an ecosystem?

Find an ecosystem in the area. Make sure to use at least one object from each ecosystem card.

LEARNING JOURNAL



Grades 3-5

STATION 3 LESSON 5

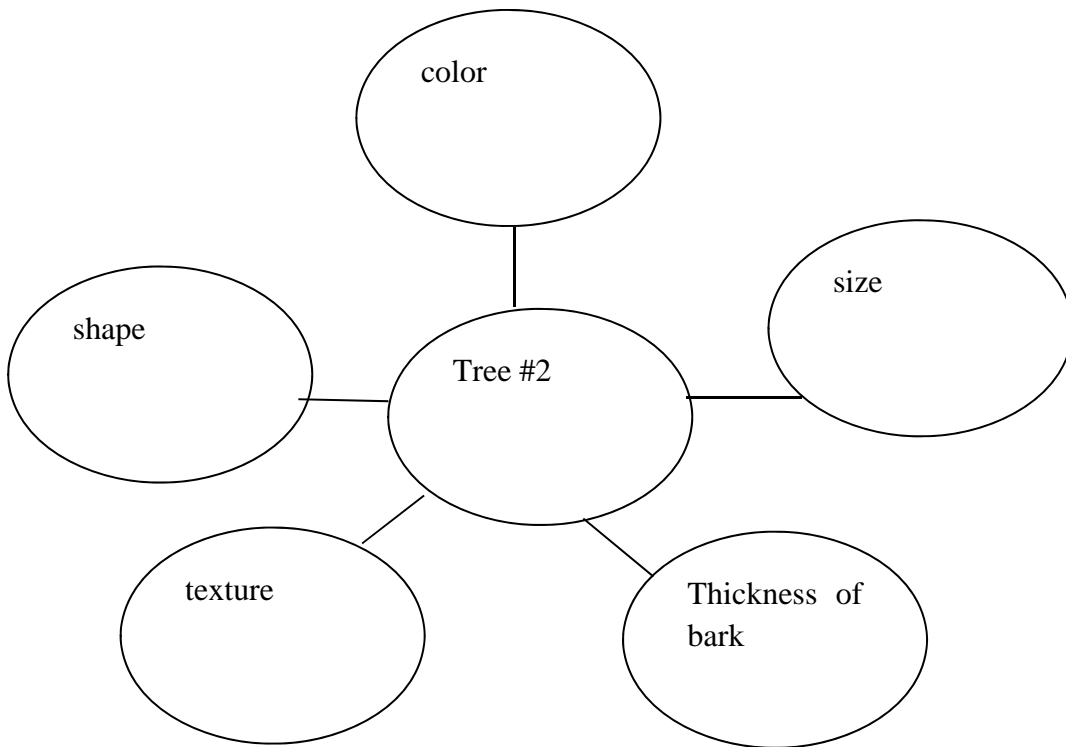
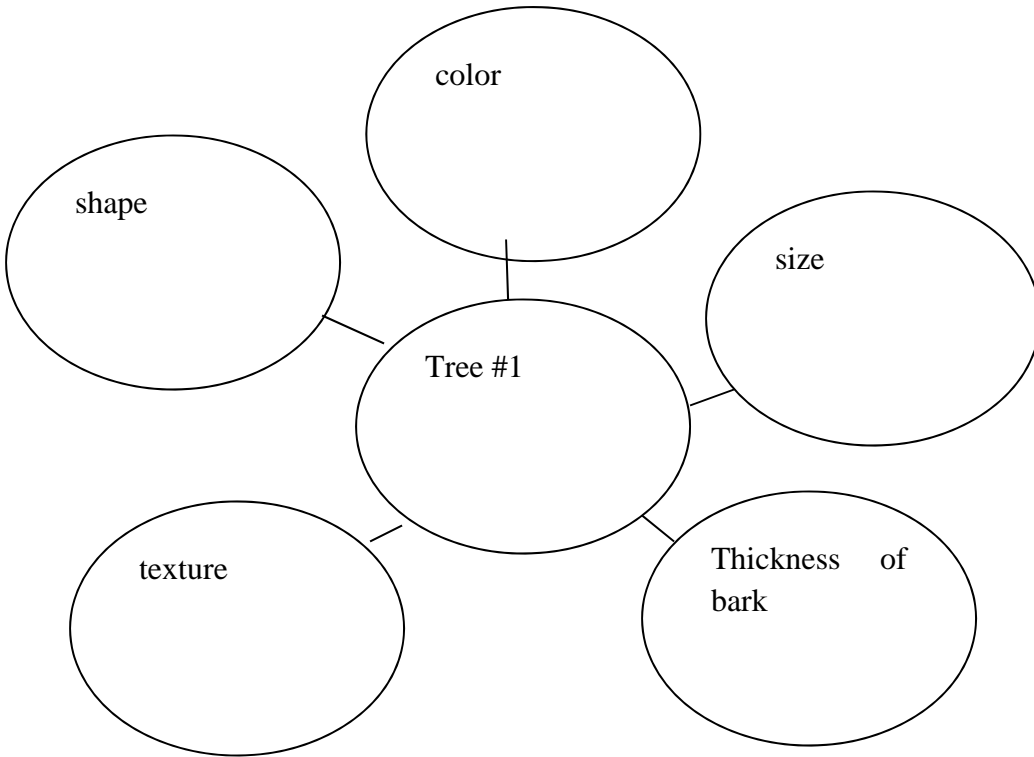
- Observe and record observations
- Combine information, data, and knowledge to reach a conclusion or make predictions.
- Describe how plant structures enable a plant to meet its basic needs.
- Describe how plants have adapted to their habitats.

Record similarities and differences of trees you observed.

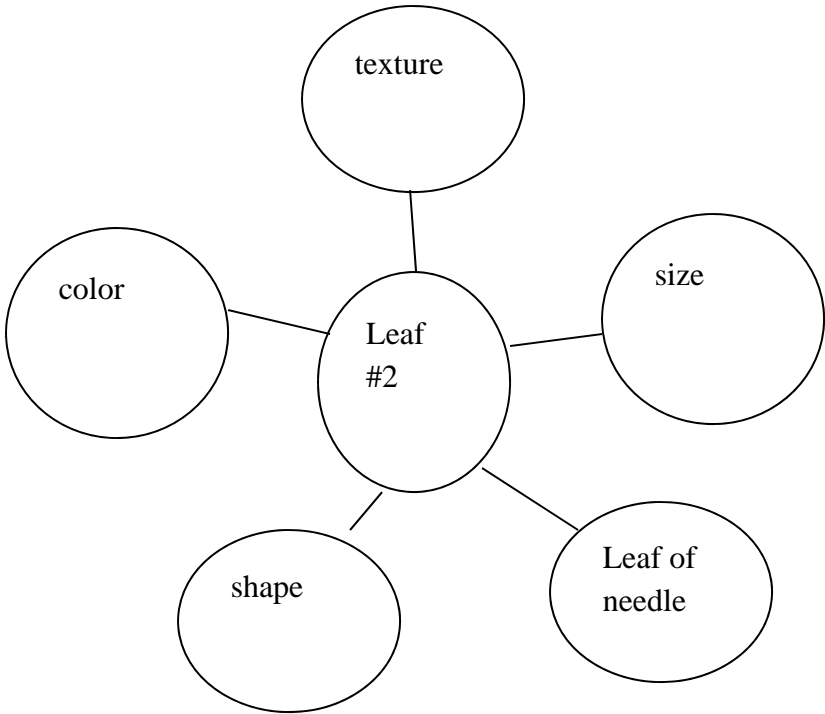
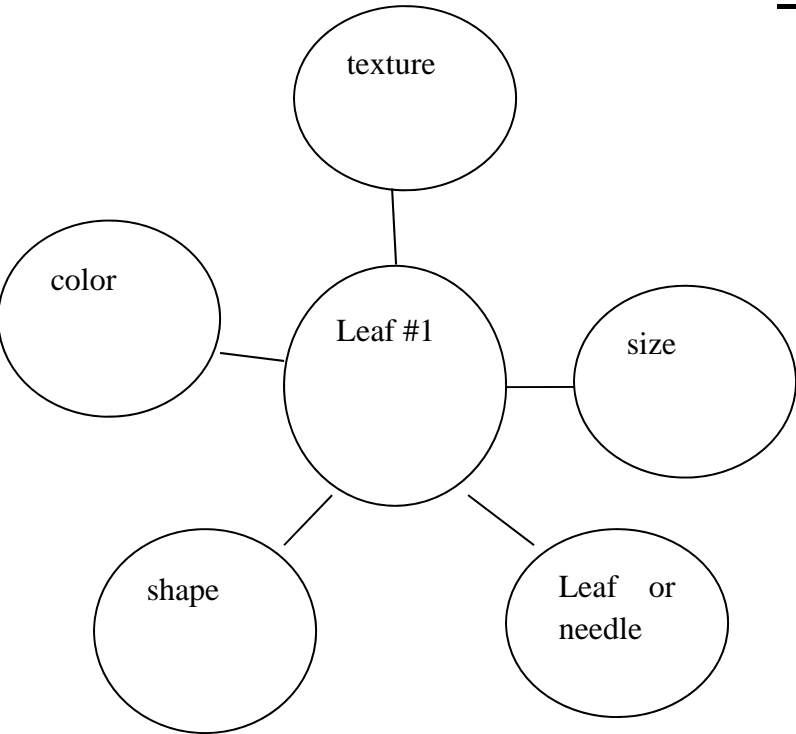
Find two different trees. Fill out graphic organizer on next page.

DRAW A PICTURE OF TWO DIFFERENT TYPES OF LEAVES (If you need more room, draw on the back of the page.)

Trees



Leaves



LEARNING JOURNAL

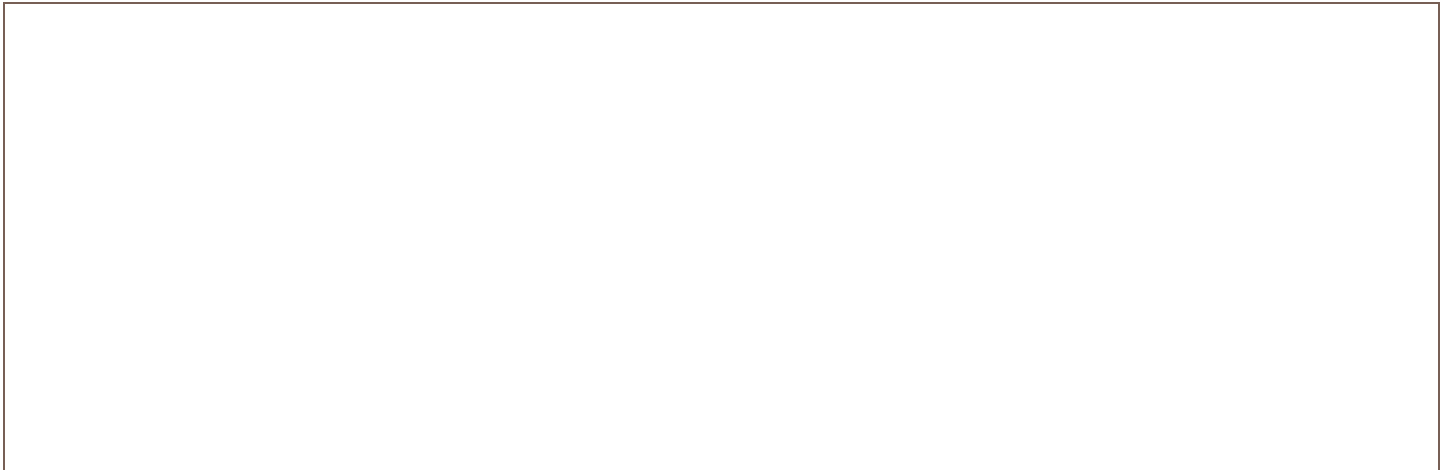


Grades 6-8

LESSON 4 STATION 1

- Students will understand the concept of buoyancy.
- Students will learn why barges are designed the way they are compared to ships.
- Students will learn why the Mississippi River is important to Louisiana's economy and the United States.

Draw a picture of a boat that you have seen or see on the Mississippi River.



Explain what kind of boat you have drawn and what its purpose on the water would be.



BOAT 1- Make a prediction of how many pennies your boat will hold. _____ pennies

How many pennies did your boat actually hold? _____ pennies

BOAT 2- Make a prediction of how many pennies your boat will hold. _____ pennies

How many pennies did your boat actually hold? _____ pennies

Questions for students:

1. What can you say about your hull design?
2. What is the equivalent "boat" to your design? Canoe, barge
3. How does the placement of pennies affect the number the boat holds?
4. What kinds of boats are used on the Mississippi River to haul cargo? Why? What advantages do barges have over deep hull boats?

How Does a Steel Boat Float?

By Captain Jim Kosmo

Vice President, Padelford Boat Co., Inc.



We all know that many objects actually will float on water, but a piece of steel will quickly sink to the bottom; so, why does a 250 ton steel riverboat such as the Harriet Bishop float? Well, actually it is the same reason that wood, styrofoam or other items float – AIR.

Most any material can be made to float if you can enclose enough air in a watertight space. Wood and other materials that float naturally will be seen to have many tiny watertight pockets of air inside them when viewed under a microscope.

To make a piece of steel (or aluminum foil) float you first must form it into a watertight shape that encloses air. The larger the watertight space the better your steel vessel will float.

Once you have mastered this step you are well on your way to building a boat. At this point you will begin to realize that a good riverboat captain better have a good background in mathematics. Mathematics is critical in determining the safety of the vessel and how much weight it can handle. Math also is required for plotting your course, but that is another lesson.

Before leaving the dock, a good captain must determine the “displacement” of the vessel. Displacement means how much water does the vessel push out of place, or displace. The weight of the water displaced will equal the weight of the boat. So you can find out how much your vessel weighs if you determine how much water it displaces when it settles into the water – i.e., measure how much of the vessel is under water. For example, if your vessel is 30 feet wide, 80 feet long and 4 feet deep in the water, the area of displacement is $30' \times 80' \times 4' = 9,600$ cubic feet. One cubic foot of water weighs 62.4 lbs, thus your vessel weighs $9,600 \times 62.4 = 599,040$ lbs or 299.5 tons.

Using this method you also can determine how many one cent coins can be loaded into your aluminum foil vessel under ideal conditions. Obviously, you will want to convert the figures to inches and ounces. If you have some truly enthusiastic students who want to do the calculations for extra credit you could give them the weight of water for a cubic foot (62.4 lbs.) and see if they can figure out how to get the weight of a cubic inch. If they need some help, tell them there are 998.4 ounces (62.4 lbs. \times 16 oz.) in a cubic foot of water and 1,728 cubic inches (12 \times 12 \times 12). Thus, a cubic inch of water weighs .578 oz. ($998.4 \text{ oz.} / 1,728 \text{ cu. in.} = .578$). The other figure you need is the weight of a Lincoln cent coin -- .11 ounces.

If the students still need assistance tell them to measure the watertight area that is created inside the aluminum foil vessel they have created. For example, if you have a 6" \times 12" piece of foil and fold it in a square shape with 1" high sides you end up with a vessel that is approximately 4" wide \times 10" long \times 1" deep. In a perfect world the foil vessel would stay afloat until the weight of the vessel and its load equals the weight of the water that is displaced: $4" \times 10" \times 1" = 40$ cubic inches \times .578 oz. (the weight of one cubic inch of water) = 23.12 oz. If you divide this displacement weight of 23.12 oz. by the weight of a penny (.11 oz.) you discover that under absolutely perfect condition the maximum number of pennies you could load before your vessel sinks is 210. In actual practice it would be virtually impossible to do this because you most likely would not be able to distribute the load perfectly. Real vessels are required to have a substantial margin for error.

Padelford Packet Boat Co., 2000

LEARNING JOURNAL



Grades 6-8

LESSON 4 STATION 2

- Students will observe the Mississippi River for abiotic (nonliving) and biotic (living) characteristics such as water flow, current and flow, and vegetation near the banks of river and shape.
- Students will compare and contrast findings at Station 1 (abiotic and biotic characteristics) with findings at Station 2
- Based on observations, students will produce a map that will display a model of the general characteristics of the Mississippi River based on observations.

OBSERVATIONS AT STATION 1 SCOTT'S BLUFF/MISSISSIPPI RIVER

ABIOTIC (nonliving)

BIOTIC (living)

ABIOTIC (nonliving)	BIOTIC (living)

Record observations about the following:

LAND FEATURES

--

WATER FEATURES

--

PLANTS

--

ANIMALS

In this space below, sketch a map of what you see at this site. Remember to include what you have recorded above.

It is important to include a legend with your map. A legend tells you which symbols on a map symbolize and represent what is a natural or man-made feature.

LEARNING JOURNAL



Grades 6-8

LESSON 1 STATION 3

- Students will simulate how trees will compete for their basic needs.
- Students will describe how varying amounts of light, water, and nutrients, affect the trees growth.
- Students will determine and understand the age of a tree by counting its annual rings.

What did the colored tiles represent?

Why was it important to collect at least one of each kind of the colored tile by the end of the activity?

How might urban foresters use their knowledge of competition in caring for a stand of trees?

Why would an urban forester need to be careful when selecting species and spacing while planning an urban forest?

WETLANDS: THE IDEAL FILTER

Name _____

Group Names _____

Materials collected to create wetland filter: Tell what your group put in the bottle to filter the muddy water (fresh leaves, grass, dried leaves, mud, small sticks, etc.)

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Explain why your group chose these materials to use in the wetland filter experiment:

What could your group have done to improve your filter?

Discuss with the group the answers to these questions:

- What are the benefits that wetlands offer to people?
- How do wetlands act as natural filters?
- If wetlands were damaged or destroyed, what would our waterways look like?
- Why would this be important to the fishing industry in Louisiana?

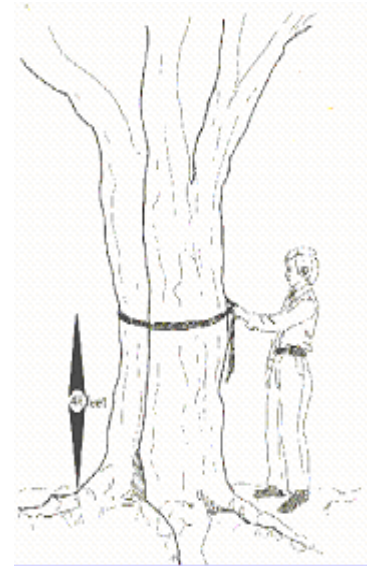


LESSON 3 STATION 3

- Student will be able to take multiple measurements of a tree while in the urban forest.
- Students will be able to conduct scientific measurements of trees using a variety of industry specific tools.
- Students will be able to understand the benefits trees provide for the environment such as carbon sequestration, carbon storage, environmental benefits of trees, etc.

How to find the diameter of a tree

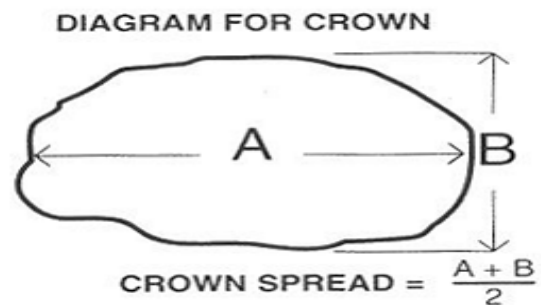
- The diameter of a tree is taken at 4.5 feet (breast height) above ground.
- Measure from the ground up the trunk to 4.5 feet. Have one person hold their hand in this location.
- At this location, a person measures the tree diameter at 4.5 feet with their diameter tape (D-tape) by wrapping the D-tape around the trunk at 4.5 feet.



Record the diameter of the tree you measured. _____

How to find the crown spread of a tree

- A tree's crown is not uniform in shape. Therefore, we are going to take two measurements and take the average between the two measurements found to find the crown's spread.
- Imagine the tree's crown is circular in shape. The goal of this activity is to find four points that are equal distance apart.
- Find the furthest outreaching limb and leaves of your target tree. Place a pin flag (See picture above)
- Have your partner walk directly away from you (where you have placed the pin flag) in a horizontal fashion passing close by the trunk. Another pin flag should be placed at the furthest limb and leaves directly across from the first flag placed.
- With 100 foot tape, measure from one pin to the other. (Your tape should be touching the tree trunk.) Keep pin flags in the ground.
- You have just completed line segment A in the diagram above.
- Repeat these steps to complete line segment B in the diagram above. You should have four pin flags around the outer edge of the crown which should divide crown into four equal parts.



- After finding both measurements, add the two together and divide that number by 2.

$$\frac{A + B}{2} = \text{Average Crown Spread}$$

Record the crown spread of the tree you measured. _____

How to find the total height of a tree

- Take the measurement of the person who will use the tangent height gauge. This measurement should be taken from their eyes to the ground. This measurement equals H (height of person eye to ground).
- Note: when taking all measurement make sure to stay in same unit of measurement and always round up to the nearest inch.
- Using the tangent height gauge, one person will walk away from the tree aligning the top site on the tangent height gauge to see the top of the tree.
- The partner will ensure that the bubble level on the tangent height gauge is level. Once the top of the tree is seen in site and the level bubble is centered, have the partner place a pin flag in the ground at that point.
- Now with the 100-foot tape, measure the distance from the pin flag to the tree. This measurement will be referred to as D (distance).
- By adding the height (H) and distance measurement (D), this will equal the height of the tree.

D + H = Total Height of Tree

****Steps can be found on the side of the Tangent Height Gauge****



Record the height of the tree.

LEARNING JOURNAL



Grades 3-5 or 6-8

LESSON 4 STATION 3

- Student will be able to identify the similarities and differences in living things
- Students will understand that scientists use a dichotomous key to determine species

Dichotomous Student Activity

1. What are two structural **similarities** between a dog and a cat?

2. What are two structural **differences** between a dog and a cat?

A dichotomous key is a tool that scientists use to identify things in the natural world based on their _____.

We use _____ questions to narrow down to possibilities. Eventually, the question answers lead us to the identification of the correct thing that we are trying to identify.

Use the following pictures to help

EXAMPLE 1



Pets



Birds



Trees





Southern University Educational and Interpretive Forest Volunteer Log

Make copies of the Volunteer Log as needed.



Name of School Group _____ **Date:** _____

Name of Volunteer	U.S. Postal Address or Email Address	Phone #	# of Hours

Note: Donations of time and expertise can be included as “matching fund” with many grants. The time that volunteers donate for planning, construction, and maintenance of your outdoor classroom is valued at over \$20 per hour. For more details visit, http://www.independentsector.org/programs/research/volunteer_time.html#value.

The Southern University Educational and Interpretive Forest is a partnership between:

Southern University **USDA Forest Service** Trinity Tree Consultants, LLC

Safety Activity

Use the word bank to fill in the letters based on what you went over with your

observe	respect	walk
leave	litter	clean
stay	proper	laws

leader. All words will be used.

1. Make sure to _____ wildlife, water, and plants. You are a guest in their home when you explore the outdoors.
2. _____, examine, but don't take or destroy. Return specimens back the way you found them.
3. _____ on designated trails and sidewalks to reduce potential destruction of surrounding areas.
4. _____ all habitats and plants as you found them.
5. _____ near an adult at all time, paying close attention to all signs around campus.
6. Do not _____. Pack it in, pack it out. Keep the outdoors _____.
7. Always wear _____ clothing and footwear.
8. Follow the _____ that protect and conserve our natural resources for future generations.

**Write 3 to 5 sentences in the box below about why it is important abide to the rules of Southern University's Education and Interpretative Forest. Let your leader read what you have written so that you are now able to sign the Code of Ethic Contract.

1 estuary	2 erosion	3 levee
4 urban forestry	5 bluff	6 hydrology
7 invasive species	8 living (biotic)	9 nonliving (abiotic)
10 delta	11 wetland	12 weathering

13 topography	14 pollution	15 river
16 watershed	17 endangered species	18 alluvial plain
19 threatened species	20 tributary	21 water cycle
22 runoff	23 Riparian zone	24 ecosystem

<p>A river or stream flowing into a larger river or lake</p>	<p>Any species (animal, plant, etc.) which are vulnerable to endangerment in the near future</p>	<p>the carrying away of earth by wind, water, or glacier</p>
<p>The study of the movement, distribution, and quality of water on Earth</p>	<p>A forest or collection of trees that grow within a city, town, or suburb</p>	<p>The process by which soil and rock are removed from the Earth's surface by natural processes (such as wind, water flow, etc.) and then deposited in other locations</p>
<p>An area where a river flows into a Sea, Ocean, or Gulf</p>	<p>Not derived from a living organism; Non-living</p>	<p>Living or once living component of a community</p>
<p>Non-native or introduced species that negatively impacts a habitat</p>	<p>A very steep and broad hill or small cliff, frequently next to a river or ocean</p>	<p>The arrangement of the natural and artificial physical features of an area</p>

<p>The contaminants of water ,soil, or the atmosphere by the discharge of harmful substances</p>	<p>Heavily vegetated area of land adjacent to a body of water</p>	<p>swamps, marshes or other areas that have a natural supply of water and are covered with water at least part of the year</p>
<p>A topographical region in which all water drains to a common area</p>	<p>A species of organisms that will likely become extinct</p>	<p>triangular-shaped deposit of soil at the mouth of a river</p>
<p>type of dam that runs alongside a river to keep it from flooding</p>	<p>A large natural stream of moving water that flows into a lake or ocean</p>	<p>The continual process of water moving in various forms(liquid, vapor, and solids) over and through earth's surface, ground, and atmosphere</p>
<p>Water from snow melt or rain that flows over land to a river or other water body</p>	<p>A group of plants and animals that interact and adapt to a physical environment including climate, water, air, and soil</p>	<p>a large landform created by the deposition of sediment over a long period of time, usually by one or more river systems</p>

Mapping the Mississippi Watershed

Teacher responses are in red

GLEs

- Analyze various types of maps, charts, graphs, and diagrams related to U.S. history (G-1A-M2)
- Locate major landforms and geographic features, places, and bodies of water/waterways on a map of Louisiana (G-1A-M2)
- Construct a chart or diagram to display geographical information in an organized way (G-1A-M2)

Objective:

- Student will be able to understand that the Mississippi watershed is all the land area that drains into the Mississippi River.
- Student will be able to create a map key identifying the various rivers that drain into the Mississippi watershed

Materials:

- Colored pencils
- Map of Mississippi River and watershed
- Map of United States waterways

Engage:

Have students guess how many rivers drain directly into the Mississippi River. Explain to students that the Mississippi watershed is all the land area that drains into the Mississippi River.

Explore:

Have students look at a variety of maps using websites. If computers are not available, make copies of map in Appendix C.

Explain:

Explain to students that today they will create a map of the Mississippi watershed by looking at a variety of rivers that drain into the Mississippi River. Students will receive a map of the Mississippi watershed, along with directions on how to find the key rivers that drain into the Mississippi River. Answers to questions are in red for teacher.

Use the map template “The Mississippi River and Watershed” and other resources to complete the following. Use another sheet for your answers.

1. On the lower right corner of your map place an arrow that indicates which direction is north on the map. Put a capital "N" at the tip of the arrow. Add the letters S, E & W around the arrow to indicate the directions south, east and west.
2. Using a light green pencil, carefully outline the Mississippi Watershed on your map by following the dashed lines. Write "watershed boundary" neatly along this line.

The Mississippi *Watershed* is all the land area that drains into the Mississippi River. On the map the watershed (or "basin") boundary is indicated by the dashed line that encircles all Mississippi River tributaries.

3. Using a light blue pencil, carefully highlight the Mississippi River; neatly label it.

4. Where does the Mississippi River begin? Mark that place with a blue dot.

By definition the Mississippi River starts at Lake Itasca in northern Minnesota. However, it can also be said that the Mississippi River starts wherever rain or snow falls in the Mississippi Watershed, because water that flows from land anywhere in the watershed will eventually flow into the Mississippi River. (This is a good point for discussion.)

5. Place a red dot on your map where Baton Rouge is located.

6. Highlight the Minnesota River with a light yellow pencil, highlight the Missouri River with light brown, and the Ohio River in orange. Label each river.

7. Using other colors, neatly highlight at least two other rivers on the map that are tributaries to the Mississippi; label each river.

8. At what city does the Missouri River meet the Mississippi River? Mark that place with a pink dot on your map. **St. Louis**

9. Make a "key" on your map to indicate what each colored line or dot represents.

10. Lay a string along the river, following all the river's curves; cut or mark the string to the length of the river. Use the scale of miles at the bottom of the map to find the approximate length of the Mississippi River.

The length of the Mississippi River is approximately 2,350 miles. Student estimates will tend to be low using this method of measurement because it is impossible for them to follow all the river's curves, many of which do not show up on this scale of map.

11. Generally, which direction does the Mississippi flow? **Southward**

12. Label the body of water that the Mississippi River flows into on your map. **Gulf of Mexico**

13. What tributary (stream or river) of the Mississippi River is your school closest to?

Answers will vary with the school. Find the stream or river closest to your school that flows to the Mississippi River. Tell students that most of the water running in your street flows to the river or a tributary of the river, too!

14. Name the states that have land along the Mississippi River. Write their two-letter postal code abbreviations (like “MN”) on each of those states on the map.

Ten states border or include the Mississippi. They are: Minnesota (MN), Wisconsin (WI), Iowa (IA), Illinois (IL), Missouri (MO), Kentucky (KY), Tennessee (TN), Arkansas (AR), Mississippi (MS), Louisiana (LA).

15. Use a pencil to darken the state boundary lines inside the Mississippi Watershed area.

How many states do you count that contribute water into the Mississippi River?

There are 31 states whose waters drain to the Mississippi. From this map, it is difficult to count them all.

The 31 states are: Alabama, Arkansas, Colorado, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, Tennessee, Virginia, West Virginia, Wyoming, and Wisconsin

16. Alberta and Saskatchewan

Elaborate:

Have students share why the Mississippi River is so important to many economies throughout the United States.

Asks students why flooding becomes an issue in the lower Mississippi River basin based on snow and ice in the upper part of the watershed.

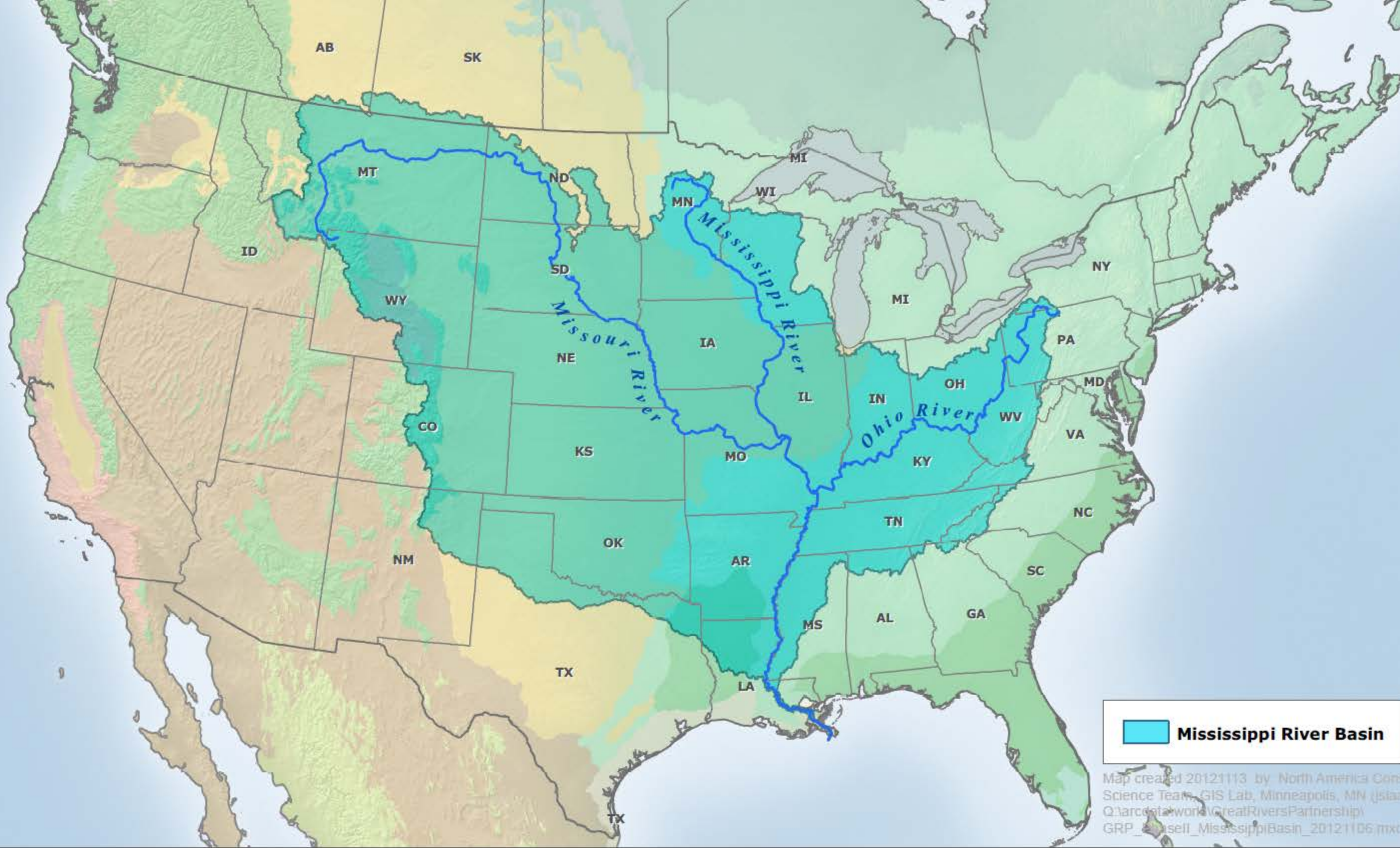
Evaluate:

Have students share their map with one another. Checking to make sure they have followed directions and correctly labeled their key. Each map should look similar since all students share the same directions.

Student Directions for Map the Mississippi Watershed

Use the map template “The Mississippi River and Watershed” and other resources to complete the following. Use another sheet for your answers.

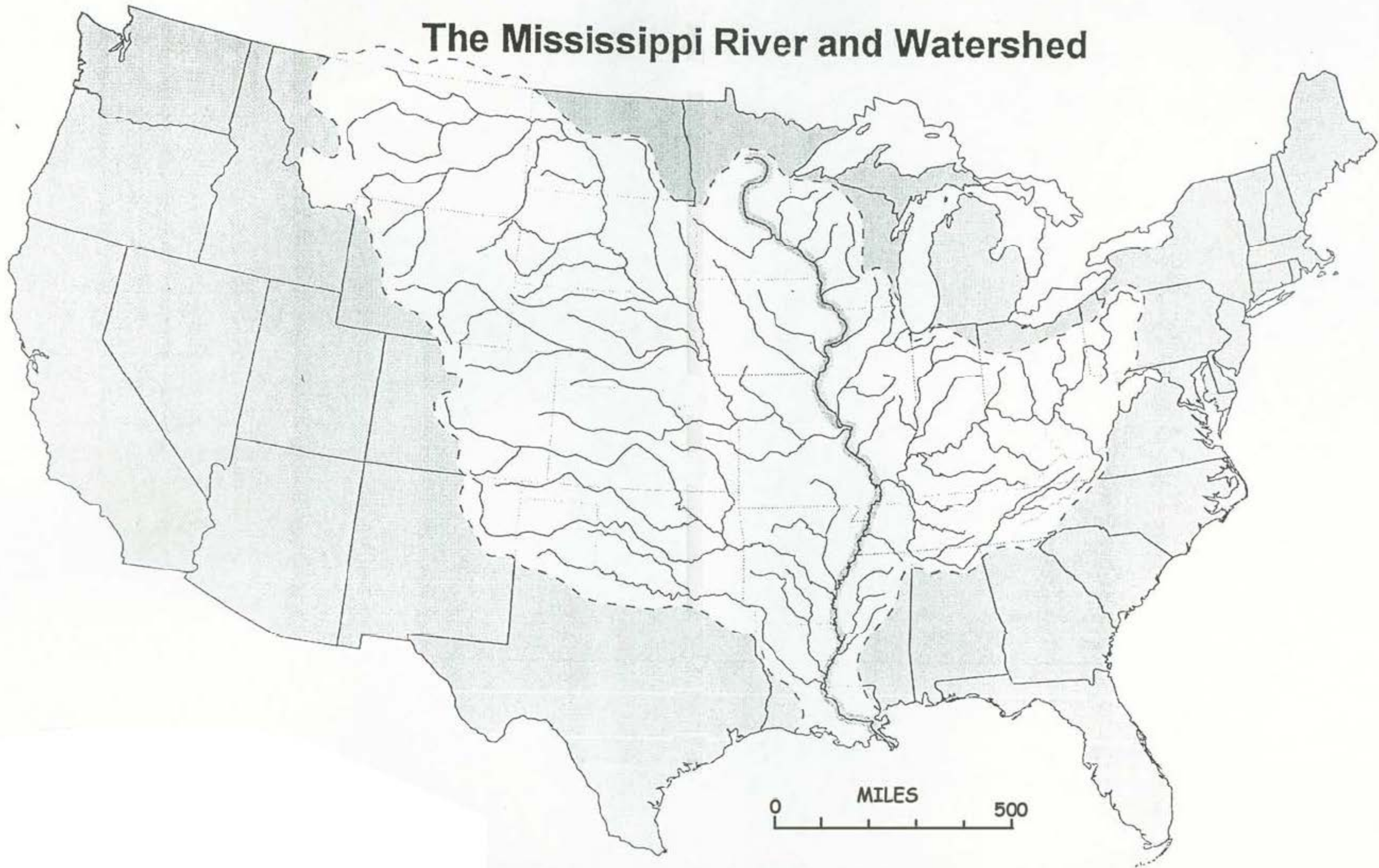
1. On the lower right corner of your map place an arrow that indicates which direction is north on the map. Put a capital “N” at the tip of the arrow. Add the letters S, E & W around the arrow to indicate the directions south, east and west.
2. Using a light green pencil, carefully outline the Mississippi Watershed on your map by following the dashed lines. Write “watershed boundary” neatly along this line.
3. Using a light blue pencil, carefully highlight the Mississippi River; neatly label it.
4. Where does the Mississippi River begin? Mark that place with a blue dot.
5. Place a red dot on your map where Baton Rouge is located.
6. Highlight the Minnesota River with a light yellow pencil, highlight the Missouri River with light brown, and the Ohio River in orange. Label each river.
7. Using other colors, neatly highlight at least two other rivers on the map that are tributaries to the Mississippi; label each river.
8. At what city does the Missouri River meet the Mississippi River? Mark that place with a pink dot on your map.
9. Make a “key” on your map to indicate what each colored line or dot represents.
10. Lay a string along the river, following all the river’s curves; cut or mark the string to the length of the river. Use the scale of miles at the bottom of the map to find the approximate length of the Mississippi River.
11. Generally, which direction does the Mississippi flow?
12. Label the body of water that the Mississippi River flows into on your map.
13. What tributary (stream or river) of the Mississippi River is your school closest to?
14. Name the states that have land along the Mississippi River. Write their two-letter postal code abbreviations (like “MN”) on each of those states on the map.
15. Use a pencil to darken the state boundary lines inside the Mississippi Watershed area. How many states do you count that contribute water into the Mississippi River?



 **Mississippi River Basin**

Map created 20121113 by North America Conservation Region
Science Team, GIS Lab, Minneapolis, MN (jslaats@inc.org)
Q:\arcdata\work\GreatRiversPartnership\
GRP_Bussell_MississippiBasin_20121106.mxd

The Mississippi River and Watershed



The Mississippi River and Watershed



Southern University Educational & Interpretative Forest Code of Ethics

Ethics is treating people, animals, objects and nature in a proper manner. Our environment is an interdependent web of natural resources. These resources are soil, water, air, plants and animals. When we use any one of these resources there is a cause and effect relationship on one or more of the other resources. A balanced use of these resources and in some cases preservation, ensures these resources will be sustained for the future. An outdoor classroom is an excellent "environment" for teaching the respect and wise use of natural resources.

When you are roaming around Southern University's campus, enjoying the outdoors, please keep the following in mind.

- 1. Respect the habitats of wildlife. You are guest in their home when you explore the outdoors. Observe wildlife from a distance when possible so as not to alter their normal behavior.**
- 2. Observe, examine, but don't take or destroy. Return study specimens back the way you found them.**
- 3. Do not destroy or disfigure plants and animals unnecessarily or against environmental laws. Leave all habitats as you found them.**
- 4. Do not litter. Pack it in, pack it out. Keep the outdoors clean. If you find litter, put it into trash bins.**
- 5. Walk only on designated trails or sidewalks to reduce potential destruction of surrounding areas.**
- 6. Follow the laws that protect and conserve our natural resources for future generations.**
- 7. Abide by all signs posted on campus.**
- 8. Always wear proper clothing and footwear.**

Suggested Websites to Use in Classroom

Websites about Wetlands 3-5

<http://www.nwf.org/Kids/Ranger-Rick/Animals/Mixture-of-Species/What-Is-A-Wetland.aspx>

<http://kids.nceas.ucsb.edu/ecology/ecoindex.html>

<http://www.discoverwater.org/explore-watersheds/>

<http://whale.wheelock.edu/watersheds/mississippi/Links.html>

<http://kids.nationalgeographic.com/kids/games/puzzlesquizzes/tree-puzzler/>

Websites about Wetlands 6-8

<http://water.epa.gov/type/wetlands/>

<http://www.nwf.org/Wildlife/Wild-Places/Mississippi-River-Delta.aspx>

<http://www.discoveryeducation.com/teachers/free-lesson-plans/mississippi-river.cfm#aca>

<http://education.nationalgeographic.com/education/encyclopedia/wetland/?ar a=1>

Suggested Literature

<http://shop.nationalgeographic.com/ngs/category/books/kids-books-and-atlases/animals-and-nature?categoryLevelId=A001#4&9004:A015&1&A015&true>

Reference Page

Lessons adapted from the following:

Project Learning Tree Environmental Education Activity Guide 2nd Edition, Washington, DC; American Forest Foundation; 1994

Project WET Curriculum and Activity Guide 2.0, Bozeman, Montana: Project WET Foundation; 2011

<http://www.nps.gov/miss/forteachers/upload/brjalumboat.pdf>

<http://btnep.org/BTNEP/resources/educators.aspx>

http://www.lsuagcenter.com/en/4H/about_4H/programs/science_engineering_technology/Youth+Wetlands+Week/Curriculum/Youth-Wetlands-Program-2013-Curriculum.htm

Southern University Educational and Interpretive Forest

Materials and Supplies

Lesson 1-Station 1

The River is a Poem

Grades: 3-5

Materials:

- Learning Journal
- Pencil
- Sample Sheet of Types of Poetry
- Chart Paper

Lesson 2-Station 1

The Mighty Mississippi

Grades: 3-5

Materials for each group:

- Pencils
- Paper
- Aluminum trays
- Craft sticks
- Scissors
- Colored Clay (Brown, Blue, Yellow, Green)
- Learning Journal

Lesson 3-Station 1

Glue Line Relief

Grades: 3-5

Materials:

- Poster board
- Drawing Pencils
- White Glue in small bottle (Eilene's tacky glue suggested)
- Heavy duty Aluminum Foil
- Rubber Cement
- India Ink
- Learning Journal

Lesson 4-Station 1

Boats along the Mississippi River

Grades: 6-8

Materials:

- Sheets of aluminum foil, approximately 12" X 6"
- Tubs of water
- Pennies, up to 100 per tub
- 1 tsp of bleach per tub
- Paper towels
- Bowls for pennies
- Learning Journal

Lesson 5-Station 1

Map Relief

Grades: 6-8

Materials:

- Newsprint
- Drawing Pencils
- Maps,
- White Glue,
- Crystal Clear Acrylic Spray Paint
- Chipboard or Canvas or Scrap wood
- Mat board scraps,
- Acrylic paint and oil paint,
- Scrap paper, paint brushes
- Learning Journal

Lesson 1-Station 2

Wetlands Store and Release

Grades: 3-5

Materials:

- Large Cut Sponges
- Strips of Cardboard
- Trowel
- Bottles for water
- Aluminum tray
- Graduated cylinder
- Magnifying lenses
- Masking tape
- Learning Journal
- Petri dish

-

Lesson 2-Station 2

Erosion, Weathering and Sedimentation
Grades: 3-5

Materials:

- Bottle of water
- Aluminum Tray
- Small bag of soil
- Toothpicks
- Learning Journal

Lesson 3-Station 2

Ecosystems
Grades: 3-5

Materials:

- Hand lenses
- Ecosystem cards
- Arrows
- Learning Journal

Lesson 4-Station 2

Louisiana's Wetland Ecology
Grades: 6-8

Materials:

- Learning Journal,
- Pencils, Markers,
- Crayons,
- Colored pencils,

Lesson 1-Station 3

Every Tree for Itself (Modified from Project Learning Tree 27)
Grades: 6-8

Materials:

- Colored Tiles (Poker chips may be used)
- Tree Cookies
- Paper Plate
- Pen, colored pencil or marker
- Timer
- Learning Journal

Lesson 2-Station 3

The Ideal Filter (Modified from Youth Wetlands Week, The Idea Filter p.172-178)

Grades: 6-8

Materials:

- Learning Journal
- Empty, clean 2 liter drinking bottles(every student should have one)
- Coffee filters
- Several kinds of soil (clay, mud, gravel, sand)
- Dead leaves
- Fresh leaves and grass
- Other materials collected from nature
- Paper
- Permanent markers
- Plastic cups
- Add clay or mud to water and shake to make muddy water (teacher provides)

Lesson 3-Station 3

Measuring Tree Height and Diameter

Grades: 6-8

Materials:

- Yardstick
- Learning Journal
- Pencil
- D-Tape
- Tangent Height Gauge
- Pin flag
- 100-foot measuring tape

Lesson 4-Station 3

Wildlife Habitat and Ecology-Dichotomous Key

Grades: 3-5 or 6-8

Materials:

- Learning Journals
- Pencil

Lesson 5-Station 3

Tree Detectives

Grades: 3-5

Materials:

- Learning Journal
- Clipboards
- Pencils
- Colored pencils

Our vision is that the material listed above for each station should be purchased and kept on site. Each station should have materials and supplies stored in large plastic tote. Each station will be stocked with the materials supplies listed above and can be easily carried out to the station upon the class arriving to the site. The totes are durable and can be written on the top with a sharpie marker to indicate which station it belongs too. All totes should be stored in the Urban Forestry building on Southern's campus when not in use. Inside each tote, can be smaller plastic containers with the materials needed for



each individual lesson. Both styles of plastic totes can be purchased at a local home improvement store or Target/Walmart.

Additionally, it is our vision that every child be equipped with a backpack. This backpack will be equipped with personal learning materials that each child will need while visiting the Southern University Educational and Interpretive Forest. There are many styles of backpacks that may work, however we are in favor of the double strap, zipper back pack style bag. We suggest the vendor (<http://www.4imprint.com>) that has affordable back pack that meet the needs of the students. The backpacks also allow for the students to carry water bottles while on the trip. We envision sponsorship logos being placed on the front of the back pack. When the child arrives to the site, he/she will be issued back pack. The backpack will be used while on site, and the student will leave with the backpack as a take home from the field trip. Each back pack will have:

- A Science Journal,
- pack of # 2 Pencils,
- pack of Loose Leaf Paper,
- pack of Colored Pencils,
- Ruler,
- hand lenses,
- water bottle,
- 12 count pack of crayons



a

Station 2 Map Example

