Essential Question: How do we come to know and appreciate the river environment and our place in it?

Content Questions: What is a river habitat? What basic needs does the river provide plants and animals?
First Grade River Biodiversity Overview

Content Question 1: What is a river habitat?

LESSON 1: What is a River Habitat?
• Students sing songs, recite poems and listen to books that introduce rivers and their habitat
• Students begin classroom model of a river

LESSON 6: River Field Trip
• Students observe animals living in and around the river
• Students help take care of the river by picking up litter

Content Question 2: What basic needs does the river provide plants and animals?

LESSON 2: Plants of the River?
• Students sing songs, recite poems and listen to books that introduce plants of the river
• Students continue to build classroom model of a river

LESSON 3: Animals That Make Their Home in the River
• Students sing songs, recite poems and listen to books that introduce animals that live in the river
• Students continue to build classroom model of a river

LESSON 4: Animals That Sometimes Live in the River
• Students sing songs, recite poems and listen to books that introduce animals that sometimes live in the river
• Students continue to build classroom model of a river

LESSON 5: Animals That Visit the River for Food and Water
• Students sing songs, recite poems and listen to books that introduce animals that visit the river
• Students continue to build classroom model of a river

Culminating Mural or Book Project
what is a river habitat?

**Essential Question:** How do we come to know and appreciate the river environment and our place in it?

**Content Question:** What is a river habitat?

**Goals**
- Students will be able to list the components of a river habitat

**Vocabulary**
- **River:** A path of freshwater that is always moving and has land on both sides.
- **Habitat:** A place where someone or something lives.

**Materials**
- Poem: "Follow the River" (provided at end of lesson)
- Song: "River Song" from *Follow the River* by Lisa Trunbauer
- Book, choose one of the following or use one of your favorites:
  - *On the River ABC* by Caroline Stutson
  - *Along the River* by Allan Fowler
  - *Three Days on a River in a Red Canoe* by Vera B. Williams
- River Mystery Bag (Any bag can be used, but one that is unique and illustrated with a river will help students identify the bag. The River Mystery Bag will be used at the beginning of each of the lessons.)
- Bag of soil (small bag that can be bought at hardware or garden store)
- Small bag or bottle filled with water
- Magnifying lens, several
- Small rocks
- Sun hat
- Plastic or glass bottle
- Clay (several small packs)
- Blue plastic wrap
- Rectangular container, at least the size of a turkey pan. A plastic or metal one is preferable.
- Index cards, 1 per student
- Large brown envelope, 1 per student
Rivers are moving bodies of water. They begin in high areas of the landscape, like hills or mountains, or where natural springs flow to the surface of the ground. They flow downhill towards larger rivers and eventually flow out to lakes or oceans.

Rivers provide a rich habitat for plants and animals. The waters of the river support many floating uni- and multi-cellular plants and animals, small crustaceans like Daphnia, as well as larger animals such as fish. The bottom of the river supports rooted plants like cattails and is home to many mussels, clams, insects, worms and crayfish. The banks of the river are also home to many plants and animals. Trees like sycamore, willows and birch and water loving plants like arrowhead often line rivers. Animals like mink and beaver make their homes on the banks of rivers. Rivers are also important to a variety of animals like ducks, geese, turtles, deer and raccoons that visit the river for food and/or water.

**Hook**

Before class copy or make a map that shows your school and relative location of the river you will be visiting for your River Field Trip (Lesson 6). Then write your students a fun and somewhat mysterious note alluding to the adventure that awaits them, that of discovering their local river. Place the map and the note in a bottle.

Here is a sample note, but feel free to be creative and make your own.

Did you know that there is a river that flows in your midst? Well I am that river. I have been floating and gurgling and twisting and turning through this city for thousands of years. I was here when only deer and squirrels, birds and beavers lived here. And I will be around for many many more years to come.

I am inviting you to come down to my banks, to peer into my waters and discover all the many creatures swimming, flying, hopping and running in and around me. If you listen carefully and look closely I have lots of secrets to share with you and your friends.

Yours truly,

Your local river

After class make sure to save the bottle, map and note as you will be using it again in Lesson 6.

Create your River Mystery Bag by decorating a bag and labeling it "River Mystery Bag". In it place the bag of soil, small container of water, magnifying lens, rocks, sun hat and bottle with the note and map.

At the beginning of class, take out the bag of soil, small container of water, rocks and magnifying lens. Ask children to guess why these items are in the bag. Allow the children to touch and feel the rocks and soil. Ask them to look at the rocks and soil with the magnifier.
Take out the bottle containing the note and map. Act surprised—open the bottle and remove the map and note with much fanfare. Show the students the map and read the note aloud excitedly.

Activity

KWL CHART
• Begin a KWL chart about rivers. Let students know that as a class, we will be charting what we know about rivers, what we want to know about rivers and explain that we will add the last section—what we learned about rivers—as we proceed through our unit. Ask students what they know about rivers generally and what they know about their local river. Have students share any river experiences they might have had. Then ask students what they would like to learn about rivers.

BOOKS AND SONGS
• Read one of the suggested river books, or find one you like. Lead a discussion after reading the book or ask questions as you read the book. Make sure your students understand what a river is, what a river habitat includes and make connections between the stories they are hearing and their own experiences. Some suggested questions are:
  • What makes a river different from a lake?
  • What makes up a river habitat? (You may need to first define what a habitat is. As you discuss the river habitat make sure to mention not only plants and animals, but soil and water and even the sun.)
  • What do you think it would be like to visit a river?

• With your students, sing the song "River Song" from the book Follow the River and/or recite the poem included at the end of this lesson.

MAKING A RIVER MODEL
• Let your students know that today they will begin to create a model of a river for their classroom. Have students list again what they think should be included in a river model. Then ask them what they think they should start with. Lead students to the idea that you need to first have the land and the water in order for the plants and animals to live.

RIVER MODEL
(as it looks at the end of the unit)
• Begin creating the class river model in the rectangular container. Give each student a small piece of clay. Have each student make a section of the river bank by rolling the clay into long "snakes." Invite each student to come up to place the "snakes" in the model to create the riverbanks.

• Then add the blue plastic wrap in the riverbed so that it looks like water. Pour soil along the sides of the box, creating land on both sides of the riverbank. Make sure you add enough dirt so that you can plant grass seed later on. Let the students know that each day we will add something new to the river model.

RIVER CARDS
• Pass out large brown envelopes and have each student draw a river habitat on the front. Give each student an index card. Have students draw a picture or cut out and paste a picture of a river on the front of the card. Then have students write a definition for the word river on the back of the card.

Reflection & Assessment
Have students begin their river journal with the prompt: What would you see and hear if you visited a river?

Use the 3-point Journal Rubric to assess students' journal entries.

Reinforcement & Enrichment
• Discuss what you learned with family members.
• Share journal entry with family members.
• Teach river song to family members

State Standards

Illinois

2.B.1a Respond to literary materials by connecting them to their own experience and communicate those responses to others.

12.E.1a Identify components and describe diverse features of the earth's land, water and atmospheric systems.

Indiana

English 1.5.1 Write brief narratives (stories) describing an experience.

English 1.7.6 Recite poems, rhymes, songs, and stories.

Social Science 1.3.8 Give examples of natural resources such as water, trees, plants, and soil, and describe how people in the school community use these resources.
Follow the River

The river flows
From here to there
I'm not sure where it starts.

It rushes on
From bank to bank
And branches off in parts.

It travels on
For miles and miles
And ends up who-knows-where.

A river is
A peaceful thing
That you and I can share.

By Mrs. Martens, Petersen High School, Chicago, IL
Lesson 2: Plants of the River

Essential Question: How do we come to know and appreciate the river environment and our place in it?

Content Question: What basic needs does the river provide plants and animals?

Goals
- Students will understand that plants live in and around rivers and be able to name at least one.
- Students will be able to articulate how animals depend on the plants of the river.

Vocabulary
Plants: Plants are living things that grow from seeds. Plants have roots, stems, leaves, flowers and seeds.

Aquatic Plants: Plants that live in the water.

Cattails: Tall aquatic plants that provide protective cover and nesting areas for animals and birds.

Water lilies: An aquatic plant whose leaves float on top of the water and whose roots reach into the bottom of the river.

Tree: A large woody plant with a long trunk, roots, branches and leaves.

Materials
- Song: “River Song” from Follow the River by Lisa Trunbauer
- Poem: “Follow the River” (included at the end of Lesson 1)
- Books: Eyewitness Books: Pond and River
- Student river journals
- River Mystery Bag
- Pictures of the seeds and plants of cattails, water lilies and red maple trees (have separate pictures of the seeds and plants). If you have them, bring in actual plants or seeds.
- Index cards, 5 per student
- Models of water lilies, cattails and trees to add to the model.
  - Water lilies can be made out of construction paper
  - Cattails can be made by painting cotton swabs (dip the stick in green and the cotton swab in brown)
• Trees can be made by using toilet paper rolls as the trunks and construction paper for the leaves

• Quick growing grass seeds, such as rye grass

**Background Information**

A variety of plants make their home in the river environment. Some, like water lilies, grow in the middle of the river. Others, like cattails, grow along the edges of rivers. Still others, like red maples, willows and birches, live on the banks of the river and the land adjacent to rivers.

Water lily leaves float on the surface of the water. Under these leaves are long stalks that reach down to the river bed where the roots are. Water lilies make a special habitat for many animals. Insects, water mites and tiny microbes make their home around the water lilies. Dragonflies and frogs often rest on top of the lilies.

Cattails can be seen along the riverbank. The cattail is among the most common of all aquatic and wetland plants anywhere. Cattails get their name from their brown cylindrical flower spikes, which can be more than one foot long. Cattails provide a protective cover and nesting area for animals and birds.

Trees that can live in often wet soil and recover from periods of flooding and can be seen along the river edge. Trees like red maples, willows and sycamores flourish in these conditions. These trees provide habitat to a variety of birds, crustaceans and insects. When their leaves fall into the river they are eaten by insects, crustaceans and worms living in the river. Fallen branches provide homes and hiding places for these same animals as well.

**Procedure Hook**

Place the River Mystery Bag in a visible place at the front of the room. Place the plant seeds and plants in the bag.

Begin the lesson by singing the river song students learned in lesson 1: "River Song" from *Follow the River* by Lisa Trumbauer and by reciting the poem "Follow the River" (included at the end of Lesson 1)

Pull plants and seeds out of the River Mystery Bag. Pass them around so that students can take a closer look.

Talk about how a seed becomes a plant. Hold up the different seeds and plants. Ask students to guess which seeds grow into which plants. Discuss how the seeds look very different from the plant and how very small seeds can grow into very large plants.
Activity

KWL
• Re-visit the KWL chart and add any new items

BOOK
• Take out the Eyewitness Books: Pond and River and turn to the pages on river plants.
• Talk about what plants live in the river (aquatic) and on the riverbank (terrestrial).
• Ask students if they think plants are very important to animals. (They are. Plants provide food and shelter. For instance, beavers eat the trees along the edges of rivers; small aquatic animals like worms and sowbugs (aquatic relatives of roly pollies) eat leaves that have fallen into the river; and mallard ducks eat the algae floating in the river. Many birds, squirrels and insects make their home in the trees next to the river and many small insects and other bugs make their homes in the limbs and leaves of those same trees when they fall in the water.)

RIVER MODEL
• Ask students what they think they should add to the river model today - plants. Have students come up and add one cattail, water lily or tree. You can also have students sprinkle rye grass seed on the soil. Just make sure to water your model daily.

RIVER CARDS
• Have students make a card for each of the following: plants, aquatic plants, cattail, tree and water lily. Give each student 5 blank index cards. Have them draw a picture on the front and write the definition on the back. Then have students place the cards in their river habitat envelope.

Reflection & Assessment

Have students write the next journal entry with this prompt: What plants live in and near the river? Why are these plants important?

Use the 3-Point Journal Rubric to assess the entries

Reinforcement & Enrichment

Discuss what you learned with family members.
• Share journal entry with family members.
• Teach song and poem to family members.
**State Standards**

**Illinois**

2.B.1a Respond to literary materials by connecting them to their own experience and communicate those responses to others.

12.A.1b Categorize living organisms using a variety of observable features.

12.B.1a Describe and compare characteristics of living things in relationship to their environments.

**Indiana**

English 1.5.1 Write brief narratives (stories) describing an experience.

English 1.7.6 Recite poems, rhymes, songs, and stories.

Science 1.4.4 Explain that most living things need water, food, and air.
Lesson 3: Animals that make their home in the river

Essential Question: How do we come to know and appreciate the river environment and our place in it?

Content Question: What basic needs does the river provide plants and animals?

Goals
- Students will understand that animals live in the river and be able to name at least one
- Students will be able to articulate how these animals depend on the river

Vocabulary
Beaver: A mammal with brown fur, a wide tail and sharp front teeth that lives in the water and gets its food from trees.

Fish: An animal that lives, eats and breathes in the water.

Materials
- Song: "River Song" from Follow the River by Lisa Trunbauer
- Poem: “Follow the River” (included at the end of Lesson 1)
- River Books:
  - Beavers by Helen H. Moore
  - What’s it Like to Be a Fish? by Wendy Pfeffer
  - Eye Witness Books: Pond and River
- River journals
- Index cards, 2 per student
- Mystery Bag
- Pictures or models of fish and beavers
- Small fish and beaver to add to river model (candy or cracker fish work well)

Background Information
Many animals make their homes in the waters of the river. Fish are probably the first animal that comes to mind. All the needs of a fish are provided by a river. Fish make their homes in the water and lay their eggs on the bottom of the river or on plants living in the river. Fish also catch their food in the river. Some fish are herbivores and eat plants and algae in the river, others are carnivores and eat small insects, worms, crustaceans or even tadpoles and other small fish; still others are detrivores and eat dead and decaying material from the bottom of the river.
the river. Fish also get the oxygen they need from the water by using their gills to breathe oxygen from the water.

Beavers are one of the largest animals living in rivers. Beavers are rodents with large, flattened tails. Beavers are about 3 ft. long; their flat thick tail is about 1 ft. long. They weigh 30-70 pounds. Like all rodents, their teeth continue to grow their entire lives. They are strong swimmers, able to swim up to 5 miles per hour and stay underwater for up to 15 minutes. While swimming, transparent eyelids protect their eyes and their ears and nostrils can be closed. Beavers can close their mouth by closing a flap located behind their teeth, allowing them to chew while holding their breath underwater. Beavers are herbivores (plant-eaters). They use their strong teeth to cut down trees and eat tree bark, leaves, roots, twigs and water plants. Many beavers build sophisticated lodges out of sticks and mud. The dome-shaped lodge is built in water and only has underwater entrances. However, in some urban rivers, the height of the river varies too much for beavers to build lodges. In these areas, beavers live in holes in the sides of the river.

**Procedure**

**Hook**

Place the River Mystery Bag in a visible place in the front of the classroom. Place the beaver and fish pictures or models in the bag.

Begin by signing the "River Song" or reciting the "Follow the River" poem.

Pull the animals out of the Mystery Bag and pass them around. Ask students: Do you think they live in the river? Why? Why not?

**Activity**

**KWL**

- Re-visit the KWL chart and add any new items

**BOOK**

- Read-aloud the two suggested books, one on beavers the other about fish.
  You can also use the Eyewitness Book as a reference.

- Talk about how the animals are both different and the same. Why do they live in the river? What do they eat? What do they look like? How do they breathe?

- Make a graphic organizer (web) for each of the animals. Include what they look like, what they eat, where they live and how they breath.

- Conclude with idea that both these two animals live in the river. Can the students think of any other animals that always live in the river? (Examples might include: water snakes, mussels, crayfish, clams, aquatic worms, leeches. The Eyewitness Book has examples of some of these.)
RIVER MODEL
- Have volunteers come up to add the fish and beaver to the class model.

RIVER CARDS
- Pass out two index cards to each student. Have students make an index card for a fish and another for a beaver. Students should draw a picture of the animal on the front and write the definition on the back. When finished, have students place the cards in their river habitat envelope.

Reflection & Assessment
Have students write the next journal entry with this prompt: What animals live in the river? Why do you think they live in the river?

Use the 3-point Journal Rubric to assess the entries

Reflection & Enrichment
- Discuss what you learned with family members.
- Share journal entry with family members.
- Teach song to family members.
- Share and explain the class river model with other classes and/or school staff.
- Write a story or journal entry from the perspective of a beaver or a fish.

Optional Activity
Print out the beaver and fish anatomy worksheets from the Enchanted Learning Web Site (www.enchantedlearning.com/subjects/mammals/rodent/Beavprintout.shtml and www.enchantedlearning.com/subjects/fish/printouts/Fishcoloring.shtml) and have students color them in and add them to their river habitat envelope.

State Standards

**Illinois**

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12.A.1b Categorize living organisms using a variety of observable features.

12.B.1a Describe and compare characteristics of living things in relationship to their environments.

12.E.1a Identify components and describe diverse features of the earth's land, water and atmospheric systems.

**Indiana**

**English 1.5.1** Write brief narratives (stories) describing an experience.

**English 1.7.6** Recite poems, rhymes, songs, and stories.

**Science 1.4.4** Explain that most living things need water, food, and air.