grade 3

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

Content Questions: What plant and animal adaptations allow them to survive in the river environment?

What food chains and food webs can be found in a river ecosystem?
3rd Grade River Biodiversity Overview

Content question 1: What plant and animal adaptations allow them to survive in the river environment?

• Read aloud The Raft

LESSON 2: Schoolyard or Park Observation
• Outdoor exploration

LESSON 3: Plants and Animals of the River
• Assess prior knowledge
• Develop class mural

LESSON 4: What is an Adaptation?
• Animal charades

LESSON 5: Field Guides for the River
• Individual student research
• Creating field guide
• Writing poems

Content question 2: What food chains and food webs can be found in a river ecosystem?

LESSON 6: The Human Food Chain
• Food chain creation with bag lunch

LESSON 7: Foods Chains and Webs of the River
• Magic School Bus Gets Eaten video
• Food chain creation with river plant or animal
• Mural

LESSON 8: River Field Trip
• Plant and animals search and identification
• Macroinvertebrate exploration
• Solo time

Culminating Writing Project
Lesson 4
what is an adaptation?

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

Content Question: What plant and animal adaptations allow them to survive in the river environment?

Goals
- Students will be able to explain what an adaptation is
- Students will role play animal adaptations

Vocabulary
Adaptation: The modification, over time, of the physical, mental or behavioral characteristics of an organism which makes it better suited to its environment.

Charades: A game in which participants use only actions and sounds (no words) to act out a word or object that others must identify based on those actions.

Materials
- 32 animal index cards (2 of each of 16 animals). Make these by making two copies of the included animal cards. If you have an odd number of students in your class, make three cards of one animal to accommodate the extra player.
- Pair of winter gloves
- Hiking or running shoes
- Reading or prescription glasses
- Journals
- Reference books on river plants and animals (see Resource section under rivers and river plants and animals for suggestions or check out your local or school library)
**Background Information**

Adaptations are characteristics that help a plant or animal survive in its environment. An organism's adaptation enables it to obtain and store food, water and air; to move about or to be transported; to protect itself and to reproduce its own species.

Humans also have adaptations, such as opposable thumbs and the ability to walk upright. Humans have also created tools to help them do tasks more effectively (these tools are not adaptations themselves, but a brain which enables us to envision and create tools is). An animal's adaptation often works like the tools we use to do a task more effectively. For example, humans can swim faster if they place plastic flippers on their feet. Geese and ducks are adapted to living in water by having permanent flippers as their feet. They use their webbed feet to move around, find their food or get away from predators. Animals are not just adapted in one way to their environment, but have a whole series of adaptations that help them survive.

**Procedure**

**Hook**

Before class, put the winter gloves, running or hiking shoes and prescription or reading glasses in the River Mystery Bag. Place bag at the front of the room when the students arrive. Choose a student volunteer to pull one item out of the Mystery River Bag. Have the student demonstrate how the item is used to help people survive in their environment. Then ask the class if they can think of any animal that has an adaptation similar to the item that the student just demonstrated. (For instance, winter gloves are similar to thick fur, running shoes are like the padded feet of coyotes and the glasses are like the keen eye sight of hawks.) Continue choosing volunteers until all items in the bag have been discussed.

Then discuss the fact that the items pulled out of the bag are not adaptations, they are tools we have developed (though having a brain which can invent such tools is an adaptation). The characteristics of animals (such as thick fur) are that animal's adaptation to the environment it lives in. Make sure students understand that an adaptation is a modification in the way a plant or animal looks, functions or behaves that helps it survive better in its environment.

**Activity**

Students will be playing a game of animal charades.

1) Give each student an animal card. Tell students not to let anyone else see their card.

2) Give students time to read the name of the animal and decide if they know enough about the animal to act it out. Walk around the room checking to make sure students are familiar with at least several adaptations.

3) Remind the students that in charades, there is No Talking! Only sounds.

4) Collect all the cards.
5) On signal, all the players begin acting out the sounds, body shapes and typical movements of their animal with the hope of finding their animal match.

6) When they find their match, both students should come to the front of the classroom.

7) End the game when all have found their matches or when a reasonable time has elapsed.

**Reflection & Assessment**

Have students share some of the adaptations they acted out that helped identify their animal.

In their journals, have the students work with their partner from the charades game to make a list of adaptations that their animal possesses and what purpose they think these adaptations serve. (e.g. Dragonfly: nonsolid wings allow the dragonfly to fly and maneuver in the wind, set of double wings make the dragonfly more maneuverable, and large eyes help the dragonfly see their food, small insects, at a distance.)

*Assessment note:* Use the **3-Point Journal Rubric** to assess the journal entry

**Reinforcement & Enrichment**

Have students do additional research into their animal to discover adaptations that may not be obvious. Have them list them in their journals.

**State Standards**

**Illinois**

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

12.B.2a Describe relationships among various organisms and their environment.

12.B.2b Identify physical features of plants and animals that help them live in different environments.

4.A.2c Restate and carry-out a variety of oral instructions

4.B.2b Use speaking skills and procedures to participate in group discussions

26.B.2b Drama: Demonstrate actions, characters, narrative skills, collaboration, environments, simple staging and sequence of events and situations in solo and ensemble dramas

**Indiana**

Science 3.1.5 Demonstrate the ability to work cooperatively while respecting the ideas of others and communicating one's own conclusions about findings

Science 3.4.1 Demonstrate that a great variety of living things can be sorted into groups in many ways using various features, such as how they look, where they live, and how they act, to decide which things belong to which group
LESSON 4: What is an adaptation?

River animal cards

American crow | Beaver
--- | ---
Bluegill | Canada goose
Common tree frog | Damselfly
Downy woodpecker | Eastern cottontail
LESSON 4: what is an adaptation?

river animal cards

great horned owl

mallard

painted turtle

raccoon

red fox

rock dove

rusty crayfish

white-tailed deer
# Field Guide Assessment

<table>
<thead>
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<th>Score</th>
<th>Criteria</th>
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| **3 exemplary** | • Includes 2 pictures: one of a plant or animal and one of an animal track or plant seed  
• Detailed observations  
• Completion of all questions  
• Superior communication through writing |
| **2 proficient** | • Includes one picture of the required two: a plant, animal, or animal track, plant seed  
• Detailed observations  
• Completion of most questions  
• Good communication through writing |
| **1 progressing** | • Missing all pictures of a plant, animal, seed or animal track  
• Adequate observations  
• Completion of some questions  
• Poor communication through writing |

**Comments:**
LESSON 5

field guide for the river

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

Content Question: What plant and animal adaptations allow them to survive in the river environment?

Goals

- Students will research and develop skills as they investigate a river plant or animal
- Students will organize information into a field guide

Vocabulary

Animal: An organism that can move and feed itself by eating other organisms, not by photosynthesizing

Habitat: Place where an animal lives, where its needs are met and it can survive

Organism: Any life form

Plant: An organism that can not move, has cellulose cell walls and makes food by photosynthesizing.

River: A flowing body of water

Track: The print of an animal’s foot, often seen in fresh snow or mud

Materials

- River Mystery Bag
- Model of brain or picture of brain
- Harry Potter glasses, or similar
- Computer mouse
- Encyclopedias
- Nonfiction and reference books on river habitats (see Resource section under rivers and river plants and animals for suggestions or check out your local or school library)
- Environmental and natural history magazines
- Field guides to plants, trees, flowers, animals, birds, etc.
- Internet access, optional
- Copies of Field Guide Form and Student Guidelines, one for each student
- Pencils
**Background Information**

Students will be creating field guides in this lesson. Field guides are books that are used to identify objects. Field guides are arranged in a way to aid identification. Bird books often group birds by where they are found (wet areas versus dry areas). Within these sections birds are arranged according to how they look, with similar birds being placed next to each other. In wildflower books, wildflowers are organized according to color of flower. Thus, the best way to find a plant or animal in a field guide is to find the general section you think your plant or animal is in and then to skim through the pages looking for something similar to what you saw. Once you find something that looks similar, check out the other plants and animals next to yours in the field guide to make sure it couldn’t be one of them. It is also helpful to check the range where the guide says the plant or animal is found to make sure it is found in your area. Field guides differ from dichotomous keys wherein you are asked a question, and then based on your response are sent off to different parts of the key to answer still more questions.

**Procedure**

**Hook**

Before class, place model brain or picture of brain, Harry Potter glasses, pencil, computer mouse and reference book in the River Mystery Bag. As class begins, pull out the various items explaining that, "We need to use this and this to complete our next assignment." Students may make predictions of how they will use each item as the teacher continues to pull items out of the bag.

**Activity**

1) Students will choose a plant or animal from the mural. Each student will be responsible for filling out the **Field Guide Form** for their chosen organism. To fill out the **Field Guide Form**, students will need to conduct research using published field guides, encyclopedias, non-fiction books, magazines, interviews of experts and the internet. Let the students know that they will be using these student-made field guides to conduct their investigations on their river field trip so it is important that they are clear and accurate. Also let them know that they do not have to fill out question 8. They will be returning to that question later.

2) Pass out the **Student Guidelines** and the blank **Field Guide Forms** to the students.

3) **Teacher Note:** Once students have completed the **Field Guide Forms**, check them for accuracy and give feedback necessary for revision. After editing is complete, collect each of the students’ work. You will need to hang on to the **Field Guide Forms** and pass them back to students during lesson 6 to fill in the answer to question 8. It is during lesson 6 that the students will be learning the definition of consumers, producers and decomposers.
Assessment note: Use the **Field Guide Assessment** rubric to assess the field guide

Reinforcement & Enrichment

In their journals, (for homework) students can write a simple, five-line cinquain poem about their plant or animal, incorporating what they’ve learned from their research. You can use the following simple format, which you can write on the board or overhead, and then have students copy it into their journals.

**Directions for Cinquain Poem:**

- **Line 1** - one word - name of subject
- **Line 2** - two words - adjectives (or related nouns) that describe subject
- **Line 3** - three word phrase - describing action of subject
- **Line 4** - four word phrase - describes poet's feelings about subject
- **Line 5** - either repeat subject’s name or a synonym for it

Here is an example:

**MONARCH**
Colorful, pollinator
Feeding on milkweed
Makes me feel free
**BUTTERFLY**

For a related art project, you could have students either color or paint pictures inspired by their research and poetry and then have them create a display of their poems and pictures in the classroom or hallway.

Assessment note: Use **3-Point Journal Rubric** at the beginning of the curriculum to assess journal entries

**Optional Activity**

1) Have students write a short narrative story or play from their plants or animal’s point of view. Suggest that they include some of the information they gathered from their research (how it moves, breathes, protects itself). They can share their stories with the class or present their plays to a younger group of students.

2) Challenge students to use the information from their research to write a three-paragraph (expository) essay about their plant or animal. They should include information about its physical characteristics, habits and habitat. They should also describe how it survives in and adapts to its river environment. Essays should include an introduction, a body and a conclusion.

Remind students to use all 5 steps of the writing process (Brainstorm, Draft, Revise, Edit and Publish.)
**Illinois**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
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<tbody>
<tr>
<td>1.B.2a</td>
<td>Establish purposes for reading; survey materials; ask questions; make predictions; connect, clarify and extend ideas.</td>
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<tr>
<td>3.B.2a</td>
<td>Generate and organize ideas using a variety of planning strategies.</td>
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<tr>
<td>3.C.2a</td>
<td>Write for a variety of purposes and for specified audiences in a variety of forms including narrative, expository, and persuasive writings.</td>
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<td>4.A.2c</td>
<td>Restate and carry out a variety of oral instructions.</td>
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<td>5.A.2b</td>
<td>Organize and integrate information from a variety of sources.</td>
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<td>12.B.2a</td>
<td>Describe relationships among various organisms and their environment.</td>
</tr>
<tr>
<td>12.B.2b</td>
<td>Identify physical features of plants and animals that help them live in different environments.</td>
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**Indiana**

<table>
<thead>
<tr>
<th>Standard</th>
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<tbody>
<tr>
<td>English 3.4.4</td>
<td>Use various reference materials.</td>
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<tr>
<td>English 3.5.2</td>
<td>Write descriptive pieces about people, places, things or experiences that develop a unified main idea and use details to support the main idea</td>
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<tr>
<td>Science 3.1.2</td>
<td>Participate in different types of guided scientific investigations, such as observing objects and events and collecting specimens for analysis</td>
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<tr>
<td>Science 3.1.3</td>
<td>Keep and report records of investigations and observations using tools, such as journals, charts, graphs, and computers</td>
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LESSON 5: field guide for the river

field guide guidelines

You and your classmates will be creating a field guide to river plants and animals that you will use during your field trip to the river. Since this guide is essential to our investigation, it is important that you fill out all parts clearly and accurately, using as much detail as possible.

Complete the following:

1) Draw a picture of your river plant or animal using as much detail as possible. If you are drawing an animal, include its track print. If you are drawing a plant, include its flowers and seeds.

2) An animal or plant’s **common name** is the name it is referred to in everyday conversation. For example, we have all heard of a monarch butterfly.

3) An animal or plant’s **scientific name** is its original Latin name. This scientific name can usually be found in an encyclopedia (or dictionary) entry, and is written in italics. The scientific name for a monarch butterfly is *Danaus plexippus*.

4) Describe what your plant or animal **looks like**. What distinguishing characteristics does your plant or animal have? How big is it? What shape and color is it?

5) Describe your plant or animal’s **specific habitat**. Find out as much detail as you can about where it lives. “Near the river” is not enough information.

6) In this section you will describe what **your animal eats or how your plant gets it food**. Most animals eat more than one thing, so list all items it eats.

7) Here you will describe **what eats your plant or animal**. Again, most plants and animals are food for many things, so list as many as you can find.

8) You do not have to fill out this question. We will return to it later.

**When you are finished, have a friend check your work to see if you followed the above directions before you hand it in.**
1) Draw your plant or animal. For an animal, also include a track print. For a plant, include the flower and seeds.

2) Common Name:

3) Scientific Name:

4) Description: What do I look like?

5) Habitat: Where do I live?

6) What do I eat, or how do I get food?

7) Who eats me?

8) Check one: Producer ____ Consumer ____ Decomposer ____