Rivers

3–5 TEACHER'S GUIDE

Shedd AQUARIUM

Grade: 3–5

Objectives:
Collect data about animals found in the Rivers gallery

Identify animal structures and behaviors that allow fishes to function and survive in a river ecosystem.

Construct a scientific explanation about how the animals' structures make them well adapted to a river ecosystem.

Timing: 30 minutes

Optional: 1 hour after Shedd visit for debrief and extension activities

Materials:
Printed activity sheet for each student

Printed chaperone guide for each chaperone

Introduction

River are constantly changing ecosystems. The plants and animals that call them home have adapted uniquely to living in these dynamic environments. In this learning experience, students will explore multiple fishes in our Rivers gallery, learn their adaptations and life cycles and use this knowledge to identify specific structures that make fishes well suited for this environment. Students will use their data to construct a scientific explanation.

Working toward these Next Generation Science Standards

4-LS1-1.A Structure and function: Animals have both internal and external structures that serve various functions in survival and behavior.

CCC Structure and function: Substructures have shapes and parts that serve functions.

SEP Constructing explanations and designing solutions: Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation.

Background information

Rivers are important bodies of water within a watershed, but they create their own important ecosystems. Rivers are characterized by water flowing in a channel. The river source is elevated above sea level. The mouth of the river is at sea level. The mouth is where the river empties out into a larger body of water such as an ocean.

Fishes have many adaptations that allow them to survive in their surroundings. In our Rivers gallery, fishes have unique life-cycle adaptations for successful breeding in the rivers they call home. Exploring these adaptations allows students to better consider how small changes in a habitat can have a larger impact. Things that seem completely unrelated to fish respiration are vital adaptations to their survival. This experience helps students practice looking at seemingly unrelated parts of a system and exploring how they might be related and impact one another.

Additional resources

https://www.fws.gov/midwest/fisheries/library/broch-paddle.pdf/

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Lesson Outline

Know before you go

Rivers: Rivers are important bodies of water. Humans can use them for energy, transportation and having fun such as fishing and swimming. Rivers are also homes to many types of plants and animals. Fishes, birds, mammals, grasses and flowers all need rivers to survive. Rivers are different from oceans and lakes because the water moves. So the plants and animals that live there have special structures that help them live in a river ecosystem.

Fishes: Fishes have to breathe just like us! How they breathe, however, is a little different from how we breathe. We can breathe in air. Fishes have to take the oxygen out of water. They do this by using their mouth and gills. In most fishes, the mouth is used to suck in water, and the gills remove the oxygen from the water. This is similar to how we breathe. We suck in air through our mouth or nose. Then our lungs take the oxygen for our bodies to use.

Substructure: Students need to have a general understanding that a system is made up of substructures. A great example is a table.

What are the parts of a table?

Legs and top

What do they do?

Legs support the top; the top is a flat surface to write on or put items on.

Explore at Shedd!

We are going to visit the Rivers gallery at Shedd Aquarium soon! While we are there, we will collect observations and data about different fishes that live in rivers around the world. Today we are going to construct a scientific explanation for the following question: Which fish would be better at living in a river?

Students should

- read the information on page 1, then circle a claim A,B, or C and support their claim with evidence and reasoning;
- explore the Rivers gallery and answer the questions for Australian lungfish and giant gouramis;
- discuss their observations and re-create their claim, evidence and reasoning with their new information;
- answer the final reflection question.

Optional classroom debrief questions

- How does being able to breath air help fishes in a river?
- Was your original hypothesis correct? Why or why not?
- Discuss the final reflection question.

Optional extension activities

Chicago River restoration case study! Research a Chicago River fish as well as restoration work that is being done on the Chicago River. Students could then write a letter to a governmental official explaining why this habitat is needed for animals and humans.

- *https://www.chicagoriver.org/*
- *http://urbanriv.org/*

Notes/considerations

Differentiation:

- Remove answer choice C from the claim section
- During their exploration of the Rivers gallery, students only observe the Australian lungfish or students answer number 1 only.