

# Rivers

## 6–8 TEACHER'S GUIDE



**Grade:** 6–8

**Objectives:**

Observe and analyze the behavior of paddlefish to support a claim on what the rostrum is used for.

**Materials:**

Printed activity sheet for each student

Writing utensil

### Introduction

Rivers are home to a great diversity of plant and animal life. In this lesson, students will investigate animals in the Rivers gallery to observe, record and hypothesize about how various external structures help animals move and eat.

### Working toward these Next Generation Science Standards

**LS1.A Structure and function:** All organisms have external parts. Different animals use their body parts in different ways to move from place to place and seek, find and take in food.

**CCC Structure and function:** Complex and microscopic structures and systems can be visualized, modeled and used to describe how an animal's functions depend on the shapes, composition and relationships among its parts.

**SEP Constructing scientific explanations:** Construct a scientific explanation based on valid and reliable evidence obtained from sources.

### Background information

All living things have external structures that help them perform daily processes necessary for life, such as movement, eating, breathing and sensing their environments. These structures are adapted to the unique characteristics of each species' habitat. Scientists use observations, experiments, fossils and other information to determine what the function of these structures are. Scientists accumulate data over time, which is used to support, refute and/or revise theories. We've seen this play out as Pluto's classification changes as we learn new information about our solar system and its exoplanets. This is all a part of the scientific process, and it is one of the most important pieces in upholding scientific integrity. Through this activity, your students will be exposed to different theories around the purpose of the rostrum of the American paddlefish and be asked to use their own observations to decide which theory they think best represents the data.

# Lesson Outline

## Know before you go

- *What is an observation?*
- *Write observations so they do not include inferences.*
- *Use observations and research to support a claim.*

## Explore at Shedd!

- Students will record their observations of butterfly goodeids in the Rivers exhibit to practice skills of observation, recording and inference.
- Students will observe the paddlefish and infer how the rostrum (paddle) is beneficial to these fish. They'll read two theories around the function of the rostrum and decide which they agree with based on their own observations and reasoning. They'll then receive new information from the fossil record, apply this to their thinking and modify ideas as needed.
- Students will choose which theory they agree with and defend their thinking with evidence from observations, the fossil record and the theories of previous scientists.

## Ask more in your classroom

Have students record which theory they supported throughout their learning process.

### Discuss your classroom data:

- What do we notice about our thoughts as a class as we learned more information?
- What new information most influenced a shift in your thinking and why?
- At the heart of good science is the continued pursuit of more information about a topic, regardless of how much we know about it. This means that there is always more to be learned. Is this an important concept for people to understand when listening to people talk about scientific findings? Why or why not?
- How has your experience today affected how you think about the field of science?

## Common Core State Standards:

### CCSS.ELA-LITERACY.W.7.1.A

Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.

### CCSS.ELA-LITERACY.W.6/7/8.1.B

Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.

## Optional extension activities

- While in the Rivers gallery, have students record observations of interesting physical features or behaviors of various fish species. Then research additional information about their fishes and write a well-supported claim as to why that physical feature or behavior is beneficial to that species' survival. Have students evaluate each other's claims for sufficient and reliable sources to back their claims. Students could do this individually as an assessment for writing claims or in small groups to build on their skills.
- Have students design a museum exhibit that would help visitors learn about the paddlefish's rostrum or another animal they explored that day.

## Notes/considerations

### Differentiation:

This activity requires a great deal of reading. Use reading buddies for moving through the activity; the sheet can be filled out individually or together in a pair/group.

