



River Otter Adaptation Experiments Part 2

Introduction

River otters have unique adaptations that allow them to survive in their environment. In these mini experiments, you will examine a few of these adaptations.

Materials

- Large plastic container
- Water
- Aluminum foil
- Scissors



Experiment 3 – Otter Tail

Methods

1. For this experiment, you are going to use the large plastic container, water, aluminum foil, and scissors.
2. Cut a length of aluminum foil that is approximately 5 inches long. On one of the short sides, fold over about 2 inches of the edge and then cut along the fold line. Take the strip of foil you cut and fold down a square as shown. Continue folding until you have a small square. Cut a short line about half-way along one edge of this square. This is your rudder.



3. Fold the remaining piece of aluminum foil into a rectangle. Bend down one short edge of the rectangle and then fold up to a point, as shown. You can then fold up each side of the rectangle to make a boat. To complete your boat, fold over the back edge of your boat, and then tilt it slightly upward to keep water from entering your boat.



If you set your boat in the large plastic container with water, it should float without taking on water. If water seeps into your boat, fold the edges up to keep the water out.

4. Along the back edge of your boat, make a small cut in the middle. To the left of this slot, you will make another cut but angle this one towards the side of your boat. Do the same on the right side. Use the red marks in the photo as a reference for where to make your cuts.



5. Attach your rudder to the boat by matching its slot to the middle slot in the boat. What do you think will happen when you put your boat on the water and push it? Write or draw your guess here.

6. Now place your boat on the water and gently push it forward. How did it travel? Draw a picture of your boat and the path it traveled below.

7. Now try placing your rudder in the left slot on the back of the boat. What do you think will happen?

8. Place the boat on the water and gently push it forward. How did it travel?
Draw a picture of your boat and the path it traveled now.

9. Now place your rudder in the right slot on the back of the boat. What do you think will happen?

10. Place the boat on the water and gently push it forward. How did it travel?
Draw a picture of your boat and the path it traveled now.

Results

When the rudder was placed in the center slot, your boat should have traveled straight when you gently pushed it forward. However, when you moved the rudder to the other slots, your boat would follow a curved path. When the rudder was placed in the left slot, your boat would curve to the right, and when the rudder was placed in the right slot, your boat would curve to the left.

Discussion

Rudders are used to steer sailboats. When facing forward, the water is able to flow evenly around the rudder, but this changes when the rudder is turned to the left or right, causing the boat to turn. River otters can use their tails like rudders, to help them steer while swimming.



Next Gen and New York State Science Learning Standards

- Grades K-2
 - **K-PS2-1:** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
 - **K-PS2-2:** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.
 - **K-ESS3-1:** Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
 - **K-2ETS1-2:** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- Grades 3-5
 - **3-PS2-2:** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
 - **3-LS4-3:** Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
 - **4-LS1-1:** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.