

## CLASSROOM ACTIVITY

# Evolution in Action: Isolation and Speciation in the Lower Congo River

Central Africa’s roiling, rapid Lower Congo River is one of the most biologically diverse rivers in the world. More than 320 fish species call it home, and about 90 of these live nowhere else. Ichthyologists from the American Museum of Natural History are working with geographers and hydrologists to explain how this extraordinary species richness came to be. Using the latest genetic methods and hydrological equipment, the team is exploring how regions of whitewater have acted as a barrier to fish movement over tens of thousands of years, thus allowing species to diverge. The results could overturn long-held assumptions about how fish evolve and demonstrate how high-resolution mapping can aid the study of freshwater communities worldwide.

## CLASS DISCUSSION

### Establish Prior Knowledge

Discuss speciation with students. If necessary, explain that speciation is the evolution of one or more genetically distinct species from an existing species. Ask students how speciation might occur. (Students may answer that a group of individuals becomes geographically isolated and evolves to become genetically distinct. Point out that species can also diverge into a genetically distinct group while inhabiting the same place.) Explain that in the video they are about to see, a scientist investigates speciation in the Lower Congo River.

### Exploration

Have students watch the video and read the synopsis. Use the following questions to guide a class discussion.

- What is the scientist’s hypothesis regarding the diversity of fish in the Lower Congo River?  
*(Answers will include: The complexity of the river’s hydrology is key to understanding why there are so many different species of fish there.)*
- What data was collected about the river?  
*(Answers will include: Scientists investigated whether the rapids and whirlpools were just on the surface. They wanted to know how deep the river was under those rapids and whirlpools. They also collected data about the velocity of the river and the direction of the river’s flow.)*
- What did they discover about how the hydrology of the Lower Congo River is affecting fish species that live there?  
*(Answers will include: Because of the river’s topography, the fish are isolated in their various niches. They are unable, for example, to swim from one side of the river to the other.)*
- What did the genetic testing of the fish species show?  
*(Answers will include: While fish species on opposite sides of the river appeared to be the same species, they were genetically different.)*
- How do the river’s features lead the evolution of new species?  
*(Answers will include: The river’s features set up natural barriers that isolate species, which then diversify.)*

### Wrap-Up

- How did researchers use the scientific method in their research?  
*(Answers will include: They posed a hypothesis, collected data about the hydrology of the river, collected fish from various parts of the river and did genetic testing. They analyzed the data and used it to support their hypothesis.)*