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**TEACHING TOOLS ABOUT**

# FRESHWATER DOLPHINS



**WILD CLASSROOM**



## WILD CLASSROOM

WWF's Wild Classroom connects educators and parents with the tools and resources they need to help kids explore and understand the world around them. Visit [wildclassroom.org](http://wildclassroom.org) to choose from a growing library of animal- and nature-related teacher's guides, fact sheets, and activity plans that you can use to enhance your science, writing, art, and other lessons.

Together we can inspire the next generation to build a future where people and nature thrive!

# FRESHWATER DOLPHINS

## ● Freshwater Dolphin Fun Facts

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- Dolphins are humans' closest aquatic relatives, for both species are warm-blooded, breathe air, and nurse their young.
- Because dolphins are mammals, they need to come to the surface of the water to breathe. They do this through their blowholes rather than their mouths, to prevent water from getting in their lungs, which could cause drowning.
- To prevent drowning while sleeping, only half of the dolphin's brain goes to sleep. The other half remains awake, so they can continue to surface to breathe.
- Along with crocodiles, sharks, and sea turtles, dolphins are some of the oldest creatures on Earth. Some scientists believe the first dolphin existed about 50 million years ago.
- Freshwater dolphins are social animals and will sometimes form large pods, just like marine dolphins. However, it is more common to see them traveling alone or in small pods, sometimes consisting of only two individuals.
- Dolphins are able to emit ultrasonic sounds, known as echolocation, that bounce off fish and other animals, allowing the dolphins to picture an image of their surroundings in their minds. This ability especially benefits the Indus and Ganges river dolphins, which are essentially blind due to life in muddy waters for generations.
- The rivers that are home to freshwater dolphins are also home to over 15% of people in the world.
- The Yangtze finless porpoise is the only porpoise species that can live in freshwater. They are known for their intelligence and mischievous smile.
- The Amazon river dolphin or "boto" is known for its distinctive pink-colored body and its flexible neck, which allows it to move its head left and right. These dolphins are not born pink; they start off gray when they're young and slowly turn pink as they get older.



## ● Freshwater Dolphin Q & A

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### What is a freshwater dolphin's extinction risk?

Different species of freshwater dolphins have varying extinction risks: Bolivian and Amazon river dolphins are listed as vulnerable; Indus and Ganges river dolphins are endangered; Yangtze finless porpoises and Irrawaddy dolphins are critically endangered; Tucuxi are data deficient (meaning there is not enough information to determine their conservation status); and Baiji are extinct.

### How many freshwater dolphins are in the wild?

Exact population counts of many freshwater dolphin species have been challenging to obtain and are therefore unknown. The most abundant species is the Amazon river dolphin, with a population of around 10,000 individuals. The Yangtze finless porpoise has the smallest population of all seven species, estimated to be only around 1,000 individuals.

### Where do freshwater dolphins live?

Freshwater dolphins are found in the Amazon, Ganges, Yangtze, Mekong, and Indus river basins. These river basins are also some of the most heavily populated and poorest areas of the world.

### What is a freshwater dolphin's weight?

The smallest species of freshwater dolphin is the Yangtze finless porpoise, weighing as little as 66 pounds. The Irrawaddy and Ganges river dolphins are the largest, each ranging in weight between 200 and 440 pounds.

### How big is a freshwater dolphin?

Freshwater dolphins range in length from 5.9 feet (Irrawaddy dolphin) to 9.2 feet (Amazon river dolphin), depending on the species.

### How many subspecies of freshwater dolphin are there?

There are seven existing subspecies of freshwater dolphins: Bolivian river dolphin, Indus river dolphin, Tucuxi, Irrawaddy dolphin, Ganges river dolphin, Amazon river dolphin, and Yangtze finless porpoise. The Baiji was declared extinct in 2006 due to increasingly common river pressures like dam development, overfishing, ship movement, and destruction of food supply.



## What is the difference between a freshwater dolphin and a marine dolphin?

Since freshwater dolphins live in rivers and marine dolphins live in oceans, their diets differ based on food availability. All dolphins eat fish; the type of fish varies depending on where the dolphin lives. Freshwater species will also eat crustaceans and small turtles, while marine species sometimes eat jellyfish and squid. Freshwater dolphins also look different from marine dolphins. River dolphins have poor eyesight, while marine dolphins have very good eyesight. Freshwater dolphins also tend to be relatively slow swimmers and rarely jump out of the water, while marine dolphins jump while swimming very fast.

## How do freshwater dolphins raise their young?

Depending on the species, a dolphin's pregnancy lasts from nine to 11 months, and one calf is usually born every two to three years. A newborn dolphin will consume milk from the mother for about two years but will also start eating fish when it is about six months old. If the dolphin is traveling in a pod, the female dolphins in the pod work together to care for all of the young, not just their own. When a dolphin is born, the females surround the mother to comfort her and help guide the newborn to the surface for air. They will also keep the young in the center of the pod to protect them.





## ● Why Freshwater Dolphins Matter

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### **Freshwater dolphins are important indicators of water health.**

All life depends on freshwater. Sustainable access to freshwater leads to healthier people and economic growth. Freshwater helps regulate the weather; transport nutrients; and keep nature clean and healthy by dissolving pollutants. With the massive role water plays for people and nature, it's important that Earth's freshwater resources be kept healthy. When a freshwater dolphin population is thriving, the state of that freshwater basin is likely also flourishing. However, if not many dolphins are present, it's considered a red flag that the health of the entire surrounding environment is declining.

### **They help balance their ecosystems.**

Freshwater ecosystems are home to more than 125,000 species, accounting for 10% of all known animals and about 50% of all known fish species. Dolphins and porpoises, playing important roles in their food webs, help balance their ecosystem. Hunting for food helps keep populations of other species stable, which maintains water and food availability. This is important to the well-being and health of humans, as well as the vast number of animals who live in these freshwater areas.

### **Dolphins are surrounded by rich local legends.**

Many cultures believe dolphins are sacred animals. Ancient legends tell of reincarnation spirits that came to exist in the form of a dolphin. One legend claims that if you go swimming alone, the dolphins may whisk you away to a magical underwater city. It was often considered bad luck to harm them and even worse luck to eat them. Unfortunately, their semi-magical status has not prevented them from being negatively impacted by human activity.



*Rain forest next to the river, Tambopata National Reserve in the Peruvian Amazon Basin, Peru.*



## ● The Threats Freshwater Dolphins Face

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Dolphins have few natural enemies; humans are their biggest threat. Activities such as dam-building, unsustainable fishing, and pollution have all contributed to the drastic decline in freshwater dolphin populations.

### Poorly planned dams

The human demand for energy has caused an increase in the use of dams. A dam in the wrong place can divide a river, changing the flow and causing blockages. Dams can disturb the migration, breeding cycles, and habitat of fish and other species that dolphins eat, limiting their food supply. Dams also isolate the dolphins' range and ability to breed and migrate, making the dolphins susceptible to inbreeding. Dolphins trapped above a dam can be exposed to poaching, while those trapped below a dam are threatened by heavy pollution and fishing traffic. In addition, roads or cities built alongside a river can prevent the river's natural cycle of growing and shrinking throughout the year. This impacts the migration routes for many freshwater species, as well as the natural flooding needed for farming.

### Unsustainable fishing practices

Many of the freshwater habitats these dolphins call home are within heavily populated regions of the world. This can create a competition for the river's resources, including fish. To keep up with demand, fishing industries are catching too many fish at once (overfishing), which reduces fish stocks and can lead to dolphins dying of starvation. Dolphins are sometimes seen as competitors for fish and are killed or injured when people try to chase them away or use them as bait for catfish. Despite it being illegal, dolphins are also occasionally hunted for their meat, oil, and use in traditional medicines. The fishing demand also increases the chances of dolphins being struck by boats due to the increase in shipping traffic. Unsustainable fishing practices, such as gillnets and dredging, can directly harm or kill dolphins and porpoises when they are accidentally caught in nets, also known as bycatch.





## Pollution

Industrial, agricultural, and mining pollution all contribute to the damaging and weakening of freshwater ecosystems. Nearby industrial factories, as well as fertilizers or pesticides from crops, pollute riverbanks and cause fish deaths. Small-scale gold mining activity releases mercury (a highly toxic element) straight into soil and water, poisoning small fish that feed in the sediment. Freshwater dolphins, among those at the top of the food web, are heavily impacted by pollution because they eat the smaller animals directly affected by these chemicals, amplifying the chemicals' effects. Sewage is also a huge concern; in many cases, communities that reside along irrigation canals directly pollute the water. Ships create noise pollution that can interfere with the dolphins' echolocation abilities. As a result, many dolphins living in busy shipping rivers are injured or die because of ship strikes.

## Climate change

The effects of climate change are altering freshwater ecosystems by impacting the amount of food and water available. Overall temperatures rising; frequent floods and droughts; and increased water loss through evaporation affect the water level and force species to leave. Human populations continue to grow, increasing demand for food and water. With less water available due to climate change and more individuals dependent on water, water shortage becomes an issue. Many areas around the world are already suffering from a lack of accessible freshwater. Climate change exacerbates this problem and puts freshwater species at risk of losing their home.



*Amazon/pink river dolphin/boto (Inia geoffrensis), Rio Negro, Brazil (Amazon).*



## ● How WWF Is Helping Freshwater Dolphins and Their Habitats

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WWF is working hard to protect and restore the habitats and populations of all freshwater dolphin species.

### Research and rescue

As increased construction of dams, roads, and buildings continues to fragment their habitat, freshwater dolphins often accidentally swim into irrigation canals and become trapped. WWF performs regular rescue and relocation operations, transporting dolphins or porpoises to safer areas where they have better opportunities to thrive. Drones are used to track and count populations, while research is conducted on dolphin ecology and vulnerability. WWF is tagging Amazon and Bolivian river dolphins and tracking them using satellite technology. The information gathered from these tags will provide new insight into the lives of these species.

### Teaching the importance of environmental conservation

WWF educates river basin communities on the benefits of reforesting riverbanks; using natural fertilizers; and reducing the amount of sewage that gets dumped in the rivers. Community fishery management zones have been developed to help sustainably manage fish and protect dolphins from accidental capture. WWF also supports alternative livelihoods that generate income for communities like dolphin watch ecotourism, aquaculture (controlled fish farming), chicken farming, and home gardening to reduce fishing pressure and bycatch of dolphins.

### Encouraging responsible water use

To conserve dolphins, you must conserve their habitat. WWF reconnects floodplain lakes with their main stem rivers to restore seasonal flows and allow the migration of species, increasing food supplies. WWF works to change how water is governed and embed the value of nature into business planning, by pushing governments to place water higher on political agendas. WWF helps companies and communities understand their impact and strategize on ways to improve their water usage behaviors. In key river basins around the world, WWF helps governments determine the best locations for dams that will not hinder free-flowing rivers and the routes of dolphins and other freshwater species.

### Managing water resources in a changing climate

WWF regularly monitors the effects of climate change on river basins in order to help local communities plan for the future and conserve their waterways. This includes measuring habitat restoration progress and influencing local governments. By working in the field (where many impacts are already being felt) and partnering with institutions (which influence water management decisions), WWF hopes to secure a future where both human and environmental needs are met.



## ● What Kids Can Do

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### Be mindful of your water use

Understand your personal impact on our water supply and all the ways you can manage that impact, both at school and at home. Be aware of how much water you use each day—whether for obvious uses such as drinking, taking a shower, or brushing your teeth or for less obvious ones such as the amount of water it took to make the t-shirts you wear or the bottles of soda you drink. Take these uses into consideration, and be mindful of not being wasteful.

### Help recharge your local water source

Whether washing clothes or watering the lawn, all the water used in our homes is drawn from nearby sources. These sources are naturally replenished by rainfall; however, hard surfaces like roads and buildings can hinder this process. Return the rain to where it belongs by using downspouts and gutters pointed toward shrubbery or trees. You can also place barrels underneath a rooftop gutter to collect rainwater for outside use like watering lawns or flower beds. Keeping the rain where it's meant to fall means more restocking of local water sources and less wasteful rainwater runoff.

### Be energy conscious

To help combat the effects of climate change, encourage your parents and teachers to explore the use of renewable energy alternatives, such as solar panels, in your home or school. Be mindful of wasting electricity; unplug devices when they're not in use. Try to walk, bike, or skateboard/rollerblade when you can, rather than use a car.

### Spread the word

Kids can talk to their parents and friends about what they have learned about freshwater dolphins and ask them to do the things on this list too!

### Start a fundraiser to help freshwater dolphins and nature

By organizing a fundraiser with WWF's Panda Nation, you're empowering your students to protect the wildlife and wild places they've been studying. It's a great opportunity to teach the importance of philanthropy and the difference we can make when we work together. Get started at [pandanation.org](http://pandanation.org).



## ● More Freshwater Dolphin Teaching Tools

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### Freshwater dolphin fill-in-the-blank word puzzle

At the end of this guide, you'll find a word puzzle (with an answer key) based on the educational content covered in this guide.

### Freshwater dolphin learning activities

Within the Freshwater Dolphin Toolkit, you'll find six fun, engaging activities designed to help students learn about freshwater dolphins and their habitats:

#### **Nature's Sponges—STEM**

Students build models of wetland ecosystems that represent the necessity and importance of these habitats.

#### **Food or Foe?—Physical Education**

A dolphin-twist on the game Marco Polo; students will understand how dolphins have adapted to find food without the use of their sight.

#### **A Drop in the Bucket—Math**

Students will evaluate their current daily water use and be tasked with designing a new daily routine, imagining they were limited in the amount of water available, as many areas of the world are.

#### **Like the River Flows—Language Arts**

After learning how rivers are like the arteries and veins of the Earth, students will develop their own metaphors and similes in a poem that reflects the importance of free-flowing rivers.

#### **Dolphin Geography Flipbooks—Social Studies**

Students will create flipbooks containing information on the threats and habitats of the seven existing species of freshwater dolphins and their neighboring communities that share their water resources.

#### **The Umbrella Effect—Arts Education**

To represent the important role that Amazon river dolphins have in their ecosystem, students will create hanging mobiles with dolphins as the centerpiece and other species, dependent on the dolphins' existence, hanging from it.



## Freshwater dolphin posters

Create an inviting learning space with these free, [downloadable posters](#) of freshwater dolphins (along with fun facts).

## WWF Together app

For more fun, interactive tools and information about freshwater dolphins and other wildlife, download the [WWF Together app](#).

## WWF Free Rivers app

Through augmented reality, interact with nature and discover how wildlife, people, and entire landscapes depend on healthy, flowing rivers in the [WWF Free Rivers app](#).



*Having access to clean water is essential to life.*



# FRESHWATER DOLPHINS

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## FRESHWATER DOLPHIN WORD PUZZLE

Complete the puzzle with words related to freshwater dolphins. Use your freshwater dolphin fact sheets to help you.

- |   |                      |
|---|----------------------|
| 1. All dolphins love to eat _____.  | <b>F</b> _____       |
| 2. Just like humans, dolphins _____ their young.  | _____ <b>R</b> _____ |
| 3. The Baiji went _____ in 2006.  | <b>E</b> _____       |
| 4. Dolphins are some of the _____ creatures on Earth.                                   | _____ <b>S</b> _____ |
| 5. Dolphins use ultrasonic sounds called _____ to find food.                            | _____ <b>H</b> _____ |
| 6. Dolphins breathe through their _____.  | _____ <b>W</b> _____ |
| 7. Dolphins are the closest aquatic relative to _____.                                  | _____ <b>A</b> _____ |
| 8. The Yangtze finless porpoise is known for its _____.                                 | _____ <b>T</b> _____ |
| 9. There are _____ species of freshwater dolphin.                                       | _____ <b>E</b> _____ |
| 10. The _____ that are home to freshwater dolphins are also home to over 15% of people. | <b>R</b> _____       |
| 11. Like humans, dolphins are warm-_____.   | _____ <b>D</b> _____ |
| 12. Dolphins are social animals and sometimes form _____.                               | _____ <b>O</b> _____ |
| 13. Like humans, dolphins are _____ and breathe air.                                    | _____ <b>L</b> _____ |
| 14. Unlike marine, freshwater dolphins rarely _____ out of the water.                   | _____ <b>P</b> _____ |
| 15. To prevent drowning, only _____ of a dolphin's brain goes to sleep.                 | <b>H</b> _____       |
| 16. The Indus and Ganges river dolphins are essentially _____.                          | _____ <b>I</b> _____ |
| 17. Amazon river dolphins turn _____ as they get older.                                 | _____ <b>N</b> _____ |
| 18. One difference between freshwater and marine dolphins is how fast they _____.       | <b>S</b> _____       |



# FRESHWATER DOLPHINS

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## FRESHWATER DOLPHIN WORD PUZZLE | ANSWER KEY

Complete the puzzle with words related to freshwater dolphins. Use your freshwater dolphin fact sheets to help you.

- All dolphins love to eat F I S H.
- Just like humans, dolphins N U R S E their young.
- The Baiji went E X T I N C T in 2006.
- Dolphins are some of the O L D E S T creatures on Earth.
- Dolphins use ultrasonic sounds called E C H O L O C A T I O N to find food.
- Dolphins breathe through their B L O W H O L E.
- Dolphins are the closest aquatic relative to H U M A N S.
- The Yangtze finless porpoise is known for its I N T E L L I G E N C E.
- There are S E V E N species of freshwater dolphin.
- The R I V E R S that are home to freshwater dolphins are also home to over 15% of people.
- Like humans, dolphins are warm-B L O O D E D.
- Dolphins are social animals and sometimes form P O D S.
- Like humans, dolphins are M A M M A L S and breathe air.
- Unlike marine, freshwater dolphins rarely J U M P out of the water.
- To prevent drowning, only H A L F of a dolphin's brain goes to sleep.
- The Indus and Ganges river dolphins are essentially B L I N D.
- Amazon river dolphins turn P I N K as they get older.
- One difference between freshwater and marine dolphins is how fast they S W I M.



**Learning Activity:**

## The Umbrella Effect

<b>Activity Type</b>	Arts and crafts
<b>Focus Areas</b>	Arts education, science
<b>Time Required</b>	30–45 minutes

### ● Overview

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Being at the top of the food web, river dolphins have an important role in freshwater ecosystems by keeping populations of other species stable. In addition, with so many animals relying on freshwater for survival, the presence of dolphins in rivers indicates healthy water quality and provides a positive outlook for the future of other species. In this activity, students will create hanging mobiles displaying species within an Amazon River ecosystem. The Amazon river dolphin will hang from the center of the mobile to demonstrate how the health of this species is directly related to the ability of other river-dependent species to thrive.

### ● Objective

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**At the completion of the activity, students should be able to:**

- Explain the correlation between dolphin health and river health.
- Name several other species that rely on the freshwater of the Amazon river basin for their survival.
- Predict how the decline of the Amazon river dolphin would affect other species.

### ● Subject and Standards

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#### National Core Arts Standards

- Creating
  - Anchor Standard #1: Generate and conceptualize artistic ideas and work.
  - Anchor Standard #2: Organize and develop artistic ideas and work.
- Responding
  - Anchor Standard #7: Perceive and analyze artistic work.
  - Anchor Standard #8: Interpret intent and meaning in artistic work.



## Next Generation Science Standards

- 3-LS4-3 Biological Evolution: Unity and Diversity
  - 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.
- 3-LS4-4 Biological Evolution: Unity and Diversity
  - Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
- 5-LS2-1 Ecosystems: Interactions, Energy, and Dynamics
  - Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

## Materials Needed

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- Cardstock (five pieces per student)
- Scissors
- Tape or glue
- Hole punch
- Wooden dowels or straws
- Yarn or thread
- Coloring utensils
- Dolphin picture (optional, included in this activity)





## ● Vocabulary

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- **Ecosystem:** the living (plants, animals, other organisms) and nonliving (air, water, soil) components of an area that interact with each other in an interconnected way
- **Extinct:** when there is no reasonable doubt that the last individual of this species has died
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Indicator species:** an organism whose presence, absence, or abundance provides information on the overall condition of the ecosystem and of other species in that ecosystem



*Amazon river dolphin/boto (Inia geoffrensis), endemic to Amazon and Orinoco Rivers, South America.*



## ● Activity Procedure

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### Part 1: Introduction and Preparation

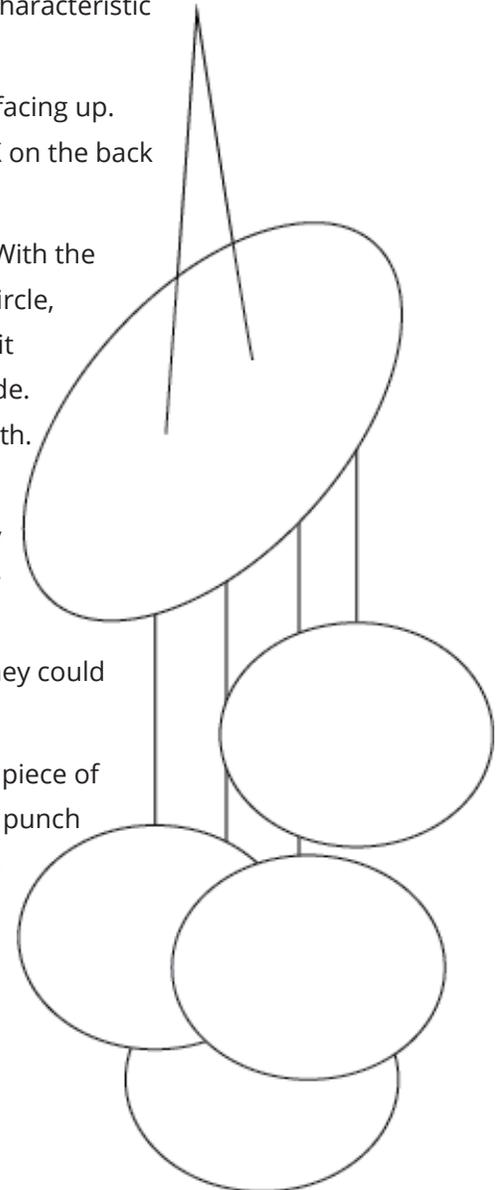
- Begin this activity by talking with students about what makes an ecosystem healthy. In an ecosystem, every member (animal, plant, air, water, soil) performs a role necessary for the system to thrive at its fullest potential. When each member is healthy and functioning, they link together to create a healthy ecosystem. However, when a component is unhealthy or missing, it will often create a domino effect, resulting in the health of the entire ecosystem declining. While discussing, it may be helpful to use an analogy, such as comparing an ecosystem to a car. A car has many parts that are necessary for it to run smoothly. If even one part is not working properly or is removed, it could potentially hinder the performance of other parts or could prevent the entire car from running.
- As key members of their food web, dolphins help keep their ecosystem healthy and functioning. The presence of dolphins in a river can tell scientists a lot about the health of the river itself. If the dolphin population is healthy and abundant, the surrounding river environment must also be in good health. However, if the population of dolphins appears to be on the decline, it is also a clear representation of the weakening health of the river. This is why dolphins are referred to as an indicator species, because their presence (or absence) is a good indication of the overall health of their environment. The decline of river dolphins is an early red flag that indicates the potential deterioration of the rest of the ecosystem. Freshwater ecosystems support more than 125,000 species, including fish, birds, and humans. By protecting dolphins, you're also protecting other animals dependent on the river, therefore strengthening the health of the entire ecosystem. This has been referred to as the "umbrella effect." See if students can think of an example of the umbrella effect in their local environment. Is there one species whose protection may help protect other animals?
- Discuss with students how the Amazon river dolphin can create an umbrella effect in the Amazon region of South America. These dolphins are being closely monitored by scientists as indicators of the health of the Amazon River. Their protection is vital for the health of their habitat and the stability of the numerous diverse species—including people—that also call the Amazon home. This includes 40,000 plant species, 3,000 freshwater fish species, and more than 370 types of reptiles. The Amazon is also one of Earth's last refuges for jaguars, harpy eagles, and these unique pink Amazon river dolphins.



## Part 2: Activity

In this activity, students will make a mobile that represents the umbrella effect that protecting the Amazon river dolphin has on other members of the ecosystem.

- Distribute materials; each student should have five pieces of cardstock, scissors, two wooden dowels or straws, tape, and a piece of yarn about four to five feet in length.
- Have students take one piece of cardstock, trace a large circle on it, and then cut it out. On the circle, they can either draw an Amazon river dolphin or use the picture at the end of this activity and tape it to the circle. Encourage them to color their dolphin, keeping in mind its characteristic shades of pink.
- Next, have students flip their circle upside down so that the plain side is facing up. Students should then take their two wooden dowels or straws, form an X on the back of the circle, and tape or glue the center of the X into place on the circle.
- Have the students take their long piece of yarn/thread and cut it in half. With the resulting two pieces, attach one to the center of the dolphin side of the circle, either with tape or by creating two small holes in the center and looping it through the center of the X formed by the dowels/straws on the underside. Have them take the remaining half and cut it into four pieces of equal length.
- Students will pick four animals that exist in the Amazon and need the river to survive. Since all species require freshwater, they can choose any four in the region. Some suggestions include jaguar, macaw, black spider monkey, sloth, poison dart frog, catfish, capuchin monkey, and human. If time allows, have students explore other species of the Amazon that they could include in their mobile.
- Have them draw and color each of the four species they selected on one piece of cardstock. Once this is completed, they should cut out each drawing and punch a small hole somewhere toward the edge. Loop one of the pieces of yarn through the hole and then tie it around the end of each dowel/straw.





- The final product should represent an Amazon ecosystem, with the Amazon river dolphin as the centerpiece, holding everything in place, including the survival of other species. The species that are hanging from the center all need the river to survive. The dolphin's absence would indicate poor river health, a grim outlook for all of the other species, and ultimately the unraveling of the entire ecosystem.





### Part 3: Discussion and Assessment

- Encourage the students to share their projects with the class by showing the Amazon species they chose to include in their mobile.
- Have the students generate ideas about what factors contribute to making a river unhealthy. This information can be found in the [Freshwater Dolphin Educator's Resource Guide](#) under the "Threats Freshwater Dolphins and Their Habitats Face" section. These factors include the building of dams and various forms of pollution. Using the resource guide as a reference, you could also share with students how WWF is working to improve these issues and what kids can do to help freshwater dolphins.

### ● Extended Learning Options

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- To learn about a freshwater habitat of a different geographical area, give students the option of creating an alternative mobile that represents the ecosystem surrounding the Yangtze River in China. Like the Amazon river dolphin, the Yangtze finless porpoise is an indicator species of this environment. The declining population of this porpoise parallels a decline in the health of the entire Yangtze river basin. The habitat of the Yangtze finless porpoise overlaps with that of other threatened and endangered species, like the Yangtze crocodile and the Chinese sturgeon. Other species that rely on the Yangtze River for survival are the giant panda, the snow leopard, and the Siberian crane. Protecting the porpoise creates an umbrella effect of protection around these other species. A picture of the Yangtze finless porpoise is included at the end of this activity.
- Use a tablet or smartphone (if available) to download the [WWF Free Rivers app](#). Students will discover the benefits of free-flowing rivers by observing a variety of species that depend on them.
- To learn more about freshwater dolphins and their habitats, download the [WWF Together app](#) and encourage students to explore the dolphin segment.
- Start a class fundraiser to protect freshwater dolphins and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at [pandanation.org](#).



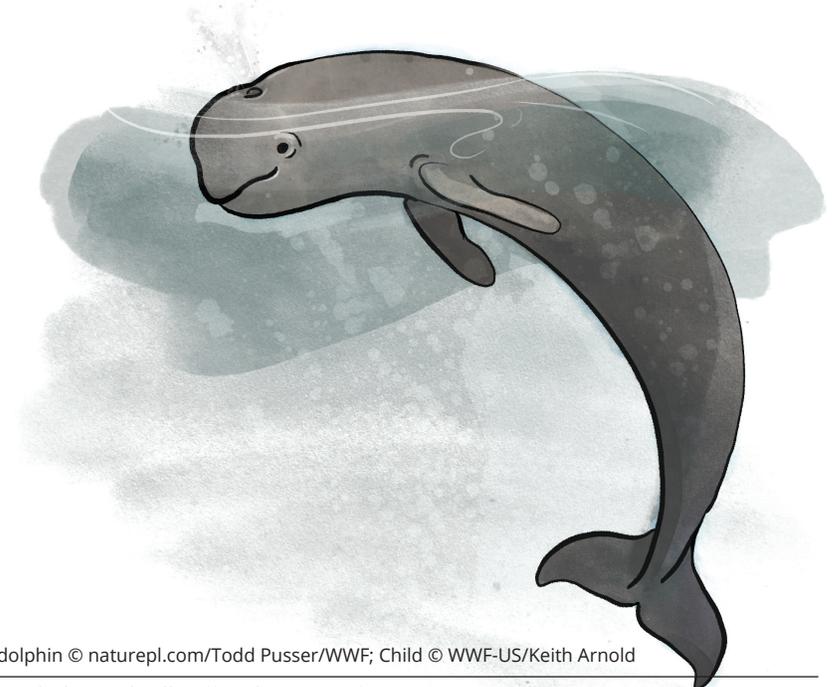
## ● Additional Background Info

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You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Article:** [Depending on Clean Water: Five Freshwater Animals](#)—provides a snapshot of five species that live in and around freshwater
- **Article:** [Tagging river dolphins for the first time: WWF and partners boost conservation efforts in the Amazon](#)—shows each step of the process to capture, tag, and release Amazon river dolphins for study
- **Article:** [The Yangtze River's last surviving mammal](#)—reflects on the fate of the finless porpoise foreshadowing the health of the whole Yangtze River system
- **Video:** [River Dolphins and the Health of the Amazon](#)—shows clips from WWF's expedition to understand the health of the Amazon river dolphin and of the river itself
- **Web Feature:** [WWF Featured Places: Amazon](#)—a glimpse into this species-rich habitat, its threats, and how WWF is working to conserve this vital area of the world
- **Article:** [In Peru, pink river dolphins are tagged with transmitters for the first time](#)—how satellite monitoring will help protect these ambassadors of the Amazon and their home

For more fun classroom activities with a focus on wild species and conservation, visit [wildclassroom.org](http://wildclassroom.org).



## Amazon River Dolphin



## Yangtze River Finless Porpoise





Learning Activity:

## Nature's Sponges

<b>Activity Type</b>	Modeling and investigation
<b>Focus Areas</b>	STEM
<b>Time Required</b>	45–60 minutes

### ● Overview

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Wetlands are some of the most productive habitats on the planet, providing numerous benefits to humans and animals. In this activity, students will create a model to test what happens when a river floods. Through this hands-on lab experiment, students will understand why wetlands are referred to as “nature’s sponges” and understand the importance of protecting these valuable habitats.

### ● Objective

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**At the completion of the activity, students should be able to:**

- Design a working model of a wetland habitat.
- Explain the comparison between a wetland and a sponge.
- Name several ways wetlands are important and what would happen without them.



*Pantanal, Brazil.*



## ● Subject and Standards

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### Next Generation Science Standards

- 3-LS4-4 Biological Evolution: Unity and Diversity
  - Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
- 3-ESS3-1 Earth and Human Activity
  - Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.
- 5-ESS3-1 Earth and Human Activity
  - Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.
- 3-5-ETS1-1 Engineering Design
  - Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

## ● Materials Needed (per student lab group)

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- Clay
- Large pan or container
- Sponge
- Cup with water
- Aluminum foil
- Copies of “Nature’s Sponges Lab” handout included in this activity
- Pencils



## ● Vocabulary

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- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Wetland:** a place where the land is covered by water, either salt, fresh, or somewhere in between, including marshes, ponds, the edge of a lake or ocean, the mouth of a river, etc.

## ● Activity Procedure

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### Part 1: Introduction and Preparation

- Use the following information to lead a class discussion on where wetlands are found and why they're important.
  - Wetlands are land areas covered by water. They are easily recognizable by their distinct vegetation, like the floating plants and shrubs, adapted to flooding and wet soil. Wetlands comprise just over 6% of the Earth's land surface. Examples of wetlands include marshes, bogs, estuaries, mudflats, swamps, lagoons, lakes, ponds, and surrounding edges of rivers, lakes, or oceans.
  - Wetlands provide a number of benefits to people and wildlife. They are home to a variety of animals, including freshwater dolphins and migratory birds looking for a food and rest stop along their journey. Wetlands are natural water filters, trapping pollutants in the soil and breaking down other elements that could be potentially harmful or unusable. By doing so, wetlands provide accessible freshwater for surrounding communities. Wetlands also help minimize impacts from flooding on 300–400 million people around the world by providing an area for water to move and slow down during storm events. They can help to buffer wind and waves, reducing the amount of destruction.
  - Half of the world's wetlands have disappeared. Roads, buildings, and other infrastructure are often constructed on wetlands, reducing their ability to function. When we pave over floodplains or build roads with walls along rivers, we destroy the habitat and prevent the river from flooding into a wetland. Wetlands can also be drained to make room for farming areas or human settlements.



- Provide students with an example of a wetland benefiting its community by mentioning the Pantanal, the largest tropical wetland in the world, located in areas of Bolivia, Paraguay, and Brazil in South America. In addition to habitat for thousands of species and a source of income and recreational uses for people, the Pantanal also provides “the sponge effect.” In the wet winter months, when the Paraguay River and its tributaries carry large amounts of water, the Pantanal wetland floods and stores massive amounts of water, like a sponge, for months. In turn, during the dry summer months, the wetland slowly releases the water, supporting the life and agriculture that depend on it. The Pantanal’s ability to store and release water has proven to be one of the most amazing natural adaptations to climate change.

## Part 2: Activity

In this activity students will create a model to test what happens to wetlands and developed land when a river floods.

- Arrange students into lab groups and distribute the materials. Each lab group should have a large pan/ container, a large sponge, clay, a cup of water, and a large piece of aluminum foil. Each student should have a pencil and a copy of the lab report included in this activity.
- Using the materials, students will create a model that demonstrates the benefits of a wetland’s ability to store water. They should follow the steps of the scientific method as written on their lab paper to complete the experiment. Take the opportunity to review the steps of the scientific method if needed.
  - Define a question or objective.
  - Generate a hypothesis (a prediction of the results).
  - Gather materials.
  - Follow experiment procedure to gather data.
  - Analyze collected information and draw conclusions.
- Start by reading the objectives aloud and having students complete the materials and hypothesis steps. The purpose of this experiment is to create a model that will demonstrate the benefits of a wetland. When creating their hypothesis, students should predict what will happen when water pours over onto the sponge versus the clay.



- Next, have them build their models by following the directions on their lab sheet.
  - Begin by molding the aluminum foil into a trough. Use the foil trough to divide the space in the pan/ container into two sections. The foil will be the area for the “river.” It needs to extend from one side of the container to the other and be able to hold water.
  - On one side of the river, students will use the clay to make a flat pavement. This will represent the side of the river that’s been developed with construction like roads and buildings. Next, students should use any remaining clay to create houses or buildings to sit on top of the developed area.
  - On the other side of the river will be the sponge. If students have any remaining clay, they can mold items to represent what would be found in a wetland (plants, animals, people).
  - Once the model is completed, students are to draw it in the space provided on the lab sheet.
- The final step of the experiment asks students to slowly pour water into their river until it overflows. Students should then record their observations of what happens to the developed area of the model and to the wetland area of their model. Have the students complete their lab report by answering the conclusion questions.





### ● Part 3: Discussion and Assessment

- Have student groups share what happened in the experiment and why. Evaluate student comprehension by having them explain what real-life scenarios these models represent. By comparing the sponge's ability to soak up the water with the clay's inability, students should recall what they learned regarding the benefits of wetlands.
- Hold a class discussion predicting what happens when wetlands are removed or destroyed. Have students use what they've learned to determine the negative consequences that result without wetlands.
  - Increased human development has not only resulted in wetlands being drained of their water, but it has increased pollution from mining, farming, and sewage. Trees, which are natural buffers of storm damage, are being lost to deforestation; dam development is cutting off rivers; and climate change is affecting water levels.
  - Without wetlands, cities have to spend more to treat water for their citizens; floods are more devastating to nearby communities; storm surges can penetrate farther inland; animals are displaced or die out; and food supplies and livelihoods are disrupted.
- Turn the discussion to focus on solutions. WWF is working hard to establish vital wetland areas (like the Pantanal) protected against unsustainable development, pollution, and drainage. In addition, WWF advocates for dam and climate change education so that governments and communities can be better informed about the choices they make. Have students brainstorm ideas as to how they can help protect wetlands.

### ● Extended Learning Options

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- Propose a follow-up activity where students learn more about the nearest wetland habitat, the species that live there, and actions they can take to raise awareness about its importance.
- For a more advanced, open-inquiry experiment, challenge students to design their own model to demonstrate the importance of wetlands, rather than using the guided instructions. Suggest designing an alternative lab about how wetlands are natural water filters, helping to clean the water as it is stored and released.
- Use a tablet or smartphone (if available) to download the [WWF Free Rivers app](#) to learn more about wetlands and their benefits.
- You can also download the [WWF Together app](#) and explore the dolphin segment to learn more about freshwater habitats and species.
- Start a class fundraiser to protect river dolphins and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at [pandanation.org](#).



## Additional Background Info

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You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Article:** [WWF Habitats: Wetlands](#)—overview of the importance of wetlands and what WWF is doing to help conserve them
- **Article:** [5 Interesting Facts About the Pantanal](#)—a glimpse at the world's largest wetland
- **Article:** [What is a wetland? And 8 other wetland facts](#)—answers frequently asked questions about wetlands
- **Article:** [Saving Wetlands and Water, Little by Little](#)—a short story following a team of young volunteers in China working to help WWF save their local wetlands
- **Article:** [The Pantanal: Saving the world's largest tropical wetland](#)—details why this ecosystem is so important and what's being done to protect it

For more fun classroom activities with a focus on wild species and conservation, visit [wildclassroom.org](http://wildclassroom.org).



Name: \_\_\_\_\_ Date: \_\_\_\_\_

## NATURE'S SPONGES LAB

- **OBJECTIVE:** To create a model showing what happens when a river overflows into a wetland versus into a developed area

- State your **HYPOTHESIS:**

I think when the river overflows, \_\_\_\_\_

- List your **MATERIALS:**

- **PROCEDURE:**

- Mold your piece of aluminum foil into a trough, and use it to divide the space in your pan/container into two sections. The foil will be your "river." It needs to extend from one side of the container to the other and be able to hold water.
- On one side of your river, use clay to mold a flat pavement. This will represent the side of the river that's been developed with things like roads and buildings. After you've spread out a flat layer of clay on one side of the river, use any remaining clay to create houses or buildings to sit on top of your developed area.
- On the other side of your river, place your sponge. If you have any remaining clay, you may create items that represent what you would find in a wetland (plants, animals, people).



# FRESHWATER DOLPHINS

- Draw a picture of your model:

- Once you've completed building your model, take your cup with water and fill your river. Keep filling with water until your river overflows. Watch carefully what happens on each side of your river.

- Record your **OBSERVATIONS:**

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- Draw your **CONCLUSIONS:**

Was your hypothesis correct? \_\_\_\_\_

Why do you think you got the results that you did?

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How does your model compare to wetlands in real life? Why do we need wetlands?

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**Learning Activity:**

## Like the River Flows

<b>Activity Type</b>	Creative writing and figurative language
<b>Focus Areas</b>	Language arts, science
<b>Time Required</b>	30–45 minutes

### ● Overview

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Rivers have been referred to as the arteries and veins of the Earth. Upon learning of the benefits that free-flowing rivers provide, students will explain this metaphor and create their own poem to demonstrate their comprehension of how free-flowing rivers are essential to life around the world.

### ● Objective

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**At the completion of the activity, students should be able to:**

- Name several benefits of free-flowing rivers.
- Explain what causes rivers not to flow and the consequences of this.
- Use similes and metaphors to create a poem about rivers.



*Amazon river dolphin/boto (Inia geoffrensis), endemic to Amazon and Orinoco Rivers, South America.*



## ● Subject and Standards

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### Common Core Standards: English Language Arts

- RF. 3.4/4.4/5.4: Read with sufficient accuracy and fluency to support comprehension.
- RI. 3.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI. 3.3: Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
- RI. 3.4/4.4/5.4: Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3/4/5 topic or subject area.
- RI. 4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- RI. 4.2: Determine the main idea of a text and explain how it is supported by key details; summarize the text.
- W. 4.4/5.4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
- W. 4.9/5.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.

### Next Generation Science Standards

- 3-LS4-4 Biological Evolution: Unity and Diversity
  - Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
- 4-ESS3-1 Earth and Human Activity
  - Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.



## ● Materials Needed

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- Copies of “Free-Flowing Rivers” reading included in this activity
- Paper
- Pencil
- [Freshwater Dolphin Educator’s Resource Guide](#) (for reference)

## ● Vocabulary

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- **Agriculture:** the process of farming soil, producing crops, and raising livestock
- **Dam:** a barrier preventing the flow of water that results in a reservoir used for human activities like irrigation and electricity generation
- **Drought:** a prolonged period of dryness that often causes damage to crops
- **Ecosystem:** the living (plants, animals, other organisms) and nonliving (air, water, soil) components of an area that interact with each other in an interconnected way
- **Endangered:** a species considered to be facing a very high risk of extinction in the wild
- **Flood:** a great flow of water that rises and spreads over the land
- **Free-flowing river:** a river that is largely unaffected by human-made changes to its flow and connectivity
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Hyperbole:** extreme exaggeration used to emphasize a point (such as “mile-high ice-cream cones”)
- **Infrastructure:** resources such as buildings and equipment required for an activity
- **Metaphor:** a figure of speech in which a word or phrase of one kind is used in place of another to suggest a likeness or analogy between them (such as “life is a rollercoaster” or “the class was a zoo”)
- **Simile:** a figure of speech comparing two unlike things using the words “like” or “as” (as in “eyes like stars” or “cool as a cucumber”)



## ● Activity Procedure

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### Part 1: Introduction and Preparation

- Prior to beginning this activity, students should have a basic understanding of similes and metaphors (you can find definitions in the vocabulary section of this activity). Both similes and metaphors are used to help paint descriptions in creative writing by comparing two seemingly unlike things. Have students demonstrate their understanding of similes and metaphors by coming up with some of their own examples.

### Part 2: Activity

In this three-part activity, students will first read about free-flowing rivers, their benefits, and their threats. Secondly, they will use what they have learned from the reading to create a simile or metaphor that compares free-flowing rivers to something that behaves similarly. And lastly, they will incorporate their simile/metaphor into a creative poem that describes the benefits of free-flowing rivers.

- Start the activity by asking students if they think they can define what a free-flowing river is. As the name states, a free-flowing river is one that is free of obstruction, allowing water to move freely. This includes the river being able to move upstream and downstream, move vertically through the riverbeds into the ground, move out over its banks to reach floodplains, and change flows with the seasons.
- Distribute copies of the attached reading, “Free-Flowing Rivers.” Assign the reading as a class, in groups, or as an individual assignment. Using the vocabulary section provided in this activity, assist students with defining any unfamiliar terms.
- After completing the reading, discuss the benefits of free-flowing rivers and what disrupts free-flowing rivers.



*Tambopata National Reserve in the Peruvian Amazon Basin, Peru.*



- Have the following written statement somewhere on display: Rivers are the arteries and veins of the Earth, pumping life to all corners of the planet. Ask the students to analyze and reflect on this statement by identifying it as either a simile or a metaphor. Next, see if they can explain what is being compared and why.
  - Just as arteries and veins help keep blood flowing to all areas of our bodies, rivers help keep nutrients and freshwater flowing all around the world. Human bodies need blood to survive; life on Earth needs water to survive. When our arteries become clogged, we are at risk of serious health problems. Clogging our rivers also has risks. When rivers get blocked or divided up by dams, it reduces the rivers' ability to flow and transport nutrients, and jeopardizes species' migration and breeding cycles.
- Using what they've learned, have students create a short poem using similes and/or metaphors to describe the necessity of free-flowing rivers on Earth. Encourage them to be creative when determining what to compare rivers to that would depict the benefits of open waterways.

### Part 3: Discussion and Assessment

- Have the students share their poems aloud, identifying the similes and metaphors they used in their free-flowing river poem. While sharing, focus on students' chosen comparisons to review how they related the positive versus negative outcomes.
- Reiterate the main takeaways from the previous discussion about what happens when rivers are blocked. In the same way that blocked arteries prevent blood from flowing throughout our bodies, blocked rivers prevent water and nutrients from flowing throughout the Earth.
- Inform the students that only one-third of the world's longest rivers remain free-flowing, untouched by dams or other barriers. Challenge students to think of ways they could help spread the word about the importance of keeping the Earth's rivers flowing freely. You can find ideas to support freshwater conservation efforts in the "What Kids Can Do" section of the [Freshwater Dolphin Educator's Resource Guide](#).



## Extended Learning Options

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- Have students incorporate hyperboles and other learned parts of speech into their poems on free-flowing rivers.
- Use a tablet or smartphone (if available) to download the [WWF Free Rivers app](#). Students can virtually interact with a landscape and discover how the placement of dams impacts the wildlife and people that depend on healthy flowing rivers.
- Also available for download is the [WWF Together app](#). Encourage students to explore the dolphin segment to learn more about rivers and the species that depend on them.
- Start a class fundraiser to protect freshwater dolphins and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at [pandanation.org](#).

## Additional Background Info

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You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Article:** [Source to Sink: What makes a free-flowing river?](#)—a graphic outlining the five pressure indicators that impact river connectivity
- **Article:** [Free-flowing Rivers](#)—describes why free-flowing rivers are important, what prevents a river from flowing freely, and what WWF is doing
- **Video:** [Stop the Don Sahong Dam and Save Mekong Dolphins: Voices from Impacted Communities - Heng Somborey](#)—a clip showing the community support rallied against a proposed dam in the Mekong River
- **Article:** [Just one-third of the world's longest rivers remain free flowing](#)—a global assessment of the location and condition of the planet's free-flowing rivers
- **Article:** [An 83% decline of freshwater animals underscores the need to keep rivers connected and flowing](#)—why freshwater species are declining at an alarming rate
- **Article:** [When infrastructure goes wrong for nature and people](#)—outlines the problems things like dams, roads, and mining pose when poorly planned

For more fun classroom activities with a focus on wild species and conservation, visit [wildclassroom.org](#).



## FREE-FLOWING RIVERS

**T**he world's rivers support the survival of both people and nature. It's important to keep these rivers free-flowing in order to provide for all of the species that depend on them.

Free-flowing rivers provide a habitat for numerous plants and animals, many of which are endangered. In order to breed, many species of freshwater fish require seasonal flows and temperature changes that free-flowing rivers provide. Millions of people depend on these freshwater fish for food and income.

Floodplain agriculture, a type of farming, is used in many parts of the world and requires a connected, naturally flowing river to transport nutrients, sediment, and water. This movement of sediment also reduces floods and droughts. Free-flowing rivers also provide fun opportunities like fishing, rafting, and wildlife watching.



## Why Free-flowing Rivers Are at Risk



**T**he building of dams, roads, bridges, and buildings is causing the biggest problems with river flow around the world.

The wrong dam in the wrong place can completely change how a river flows and can cause blockages. When dams are built, animals like salmon and dolphins that migrate to find food, reproduce, or seek new habitat are stuck.

This threatens the survival of their species, which other animals and people depend on. Dams also prevent sediment from traveling, which can cause flooding.

A road or city built alongside a river can disconnect the river and prevent it from naturally growing and shrinking. As populations of people increase, more and more freshwater is removed from rivers for human uses like farming and industry.



**Learning Activity:**

**Food or Foe?**

<b>Activity Type</b>	Game
<b>Focus Areas</b>	Physical education, science
<b>Time Required</b>	20–30 minutes

## ● Overview

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To understand the adaptations of dolphins that help them survive in their environment, students will engage in a dolphin-themed version of the familiar game Marco Polo that relies on fully utilizing the senses. Students will learn how, as with many superhero characters, the absence of one sense does not result in inferiority; it can often help strengthen a different sense. If technology is available, students can explore the dolphin interactive on the [WWF Together app](#) that models what these incredible animals see using echolocation.

## ● Objective

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**At the completion of the activity, students should be able to:**

- Explore their reliance on other senses when one sense is taken away.
- Explain echolocation and how it's used.
- Describe other characteristics and adaptations of freshwater dolphins, including those that separate them from their marine relatives.

## ● Subject and Standards

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**Shape America National PE Standards—Highly Effective Physical Education**

- Standard 1: The physically literate individual demonstrates competency in a variety of motor skills and movement patterns.
- Standard 2: The physically literate individual applies knowledge of concepts, principles, strategies, and tactics related to movement and performance.
- Standard 4: The physically literate individual exhibits responsible personal and social behavior that respects self and others.



## Next Generation Science Standards

- 3-LS2-1 Ecosystems: Interactions, Energy, and Dynamics
  - Construct an argument that some animals form groups that help members survive.
- 3-LS3-2 Heredity: Inheritance and Variation of Traits
  - Use evidence to support the explanation that traits can be influenced by the environment.
- 4-LS1-2 From Molecules to Organisms: Structures and Processes
  - Use a model to describe that animals receive different types of information through their senses, process the information in the brain, and respond to the information in different ways.

## Materials Needed

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- A large open area
- Blindfold
- Small containers filled halfway with popcorn kernels (or substitute)
- Small containers filled halfway with beads (or substitute)

## Vocabulary

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- **Adaptation:** changes to a plant or animal that make it better equipped to survive under the conditions of its environment
- **Echolocation:** a natural ability of locating distant or invisible objects by releasing sound waves that reflect off the objects
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Pod:** a number of animals clustered together
- **Sonar:** a method for detecting and locating objects especially underwater by means of sound waves sent out to be reflected by the objects
- **Ultrasonic:** having a frequency above what a human ear can hear



## ● Activity Procedure

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### Part 1: Introduction and Preparation

- To start this activity, students should be familiar with the term “adaptation” (you can find the definition in the vocabulary section included in this activity). Discuss with your students how animals adapt to their environment and evolve to exhibit traits that help them better survive. In some cases, animals may lack certain abilities or senses, but in return gain heightened awareness of others. These adaptations can be a result of their environment and have taken generations to develop.
  - For example, the Indus and Ganges river dolphins are both essentially blind. This limitation likely has evolved over many years of living in extremely murky, muddy river waters. Due to their poor eyesight, these dolphins have had to rely on other senses and adaptations, such as echolocation, to help them survive in their environments. Echolocation is a natural sonar system that dolphins use to track sources of food. Using sound, this ability allows them to detect even very small objects underwater. The dolphins emit ultrasonic waves that bounce off fish and other animals, allowing them to picture an image of their surroundings in their minds. They rely on echolocation and their other senses to find food, protect themselves, and continue to thrive in their environment, all without being able to see.

### Part 2: Activity

In this activity, students will participate in a land-based version of the swimming pool game Marco Polo, where they will imitate how dolphins use sound to locate food.

- Before starting the game, prepare several containers, some containing popcorn kernels (representing food) and some containing beads (representing a fishing boat)—or any two items that create different sounds.
- Remind students that the use of echolocation by dolphins not only involves emitting sound waves to bounce off objects, but being able to interpret those returned waves to determine what kind of object it is. In some situations, such as while hunting for food, the sound they hear may mean something worth investigating. In other cases, such as when avoiding a fishing boat, the sound they hear may mean it would be in the dolphin’s best interest to go the other way.
- In this version of Marco Polo, the blindfolded student will be the freshwater dolphin. The other students will be either food, fishing boats, or neither. Determine who will be the dolphin, food, and fishing boats to begin the game.



- Have the student designated as the dolphin stand in the middle of an open area with the other students spread out all around. Blindfold the dolphin and pass out a few noise containers to random students in the area. The challenge will be for the dolphin to differentiate between the sound of the food (popcorn) and the sound of a fishing boat (beads). Do a test of both sounds so the blinded dolphin can recognize each.
- Instead of having the blindfolded student yell “Marco,” ask him/her to make dolphin sounds or yell “Susu”—a local nickname given to the Ganges river dolphin, which refers to the sound the dolphin is said to make when it breathes.
- When the student chosen as the dolphin makes the call, the students holding the noise containers should give them a short shake. The dolphin will have to follow and differentiate between the sounds, with the goal being to eventually tag a student holding a popcorn container (food).
- If the dolphin incorrectly tags a student who isn’t holding a container, he/she will have to continue looking (the dolphin is still hungry). If the dolphin incorrectly tags a student who is holding the opposite container, one that contains beads and represents the fishing boat, the dolphin is out.
- The game can continue, rotating students assigned as dolphins, food, or boats, for as long as desired.



Amazon/pink river dolphin/boto (*Inia geoffrensis*), Rio Negro, Brazil (Amazon).



### Part 3: Discussion and Assessment

- Ask the students who participated as dolphins to share their experience of relying on other senses when they couldn't use their sight. Did they discover how much they paid attention to what they heard or felt?
- Share with students other adaptations of freshwater dolphins that help them to survive. Then challenge them to choose an animal and reflect on special adaptations it possesses that help it thrive in its environment.
  - Besides using echolocation, Indus and Ganges dolphins have adapted another behavior that they use to find food. These dolphins swim on their side, with one flipper trailing along the bottom of the river, churning up the sediment to reveal hiding creatures. After they surface to breathe, the dolphin will roll over to have the opposite side face the bottom, dragging the other flipper through the bottom and repeating the behavior.
  - Dolphins are social animals and will sometimes form large pods. The female dolphins in the pod work together to protect newborn dolphins and their mother. They'll surround the mother to comfort her and help guide the newborn to the surface for air. They will also keep the young in the center of the pod to protect them.
  - Unlike other dolphins, the Amazon river dolphin has a flexible neck, allowing it to move its head left and right.
- You can compare this echolocation ability of these river dolphins to the traits of certain superheroes. There are superheroes who are blind or who lack certain abilities but have gained other abilities that help them survive and combat supervillains. Have students think of examples in the superhero world that demonstrate unique adaptation abilities as these river dolphins do.
- Use a tablet or smartphone (if available) to download the [WWF Together app](#). Encourage students to explore the dolphin segment, which contains an interactive module that allows you to see what dolphins see when using echolocation.





## Extended Learning Options

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- Assign a follow-up activity that asks students to compare themselves to these blind freshwater dolphin species by creating two short lists: one with skills that they excel at and the other with things that they do not. This activity can aid in a lesson on acknowledging your weaknesses and celebrating your strengths.
- Research the appearances and behaviors of freshwater and marine dolphins; then, using a Venn diagram, compare and contrast. Marine dolphins also use echolocation, but their vision is considered much more acute than that of their freshwater relatives. Why might they still need to use echolocation?
- Have students research other unique adaptations and senses present throughout nature. An example is the power of regeneration. A number of organisms, such as lizards, spiders, sea stars, and sharks, all have the ability to repeatedly lose a body part that their body then naturally replaces. This coincides with many superheroes who possess a healing factor, making them able to recover quickly from any wound, disease, or toxin.
- Using what they've learned about river habitats, challenge students to create their own river superhero creature, explaining the superhero-like traits they would give it and why.
- Use a tablet or smartphone (if available) to download the [WWF Free Rivers app](#) that allows students to interact with a river habitat that these dolphins and many other species depend on.
- Start a class fundraiser to protect river dolphins and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at [pandanation.org](#).

## Additional Background Info

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You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Web Feature:** [WWF Featured Species: Dolphins and Porpoises](#)—contains more information on marine and freshwater dolphins and porpoises
- **Article:** [What's the difference between a dolphin and a porpoise? And other river dolphin facts](#)—answers commonly asked questions on what distinguishes a dolphin from a porpoise
- **Video:** [Irrawaddy Dolphins Swimming in the Mekong](#)—short clip of Irrawaddy dolphins surfacing
- **Video:** [WWF Together: Dolphins](#)—an introduction to the WWF Together app dolphin segment

For more fun classroom activities with a focus on wild species and conservation, visit [wildclassroom.org](#).



Learning Activity:

## A Drop in the Bucket

<b>Activity Type</b>	Word problem
<b>Focus Areas</b>	Math, science
<b>Time Required</b>	30–45 minutes

### ● Overview

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Accessible freshwater accounts for less than 1% of the total water on Earth. For this reason, it's important that we use it wisely. This activity asks students to prioritize their water needs and divide an allotted amount of freshwater among their group. When reflecting on the challenge behind this activity and comparing it to their current water usage, students will understand the real-life challenges existing in many parts of the world where access to freshwater is limited.

### ● Objective

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**At the completion of the activity, students should be able to:**

- Discover the hidden quantities of water that go into everyday activities and items.
- Consider current water use habits and rethink behaviors.
- Explain the water cycle, and list ways of helping water return to its source.





## ● Subject and Standards

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### Common Core Standards: Math

- MP.1: Make sense of problems and persevere in solving them.
- MP.2: Reason abstractly and quantitatively.
- MP.4: Model with mathematics.
- 3.OA.A.3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- 3.OA.A.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that  $8 \times 5 = 40$ , one knows  $40 \div 5 = 8$ ) or properties of operations.
- 3.MD.A.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
- 4.MD.A.2: Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
- 5.MD.A.1: Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems.

### Next Generation Science Standards

- 4-ESS3-1 Earth and Human Activity
  - Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 5-ESS2-2 Earth's Systems
  - Describe and graph the amounts and percentages of water and freshwater in various reservoirs to provide evidence about the distribution of water on Earth.



## Materials Needed

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- Copies of “A Drop in the Bucket” handout included in this activity
- Pencil
- Large clear container
- Vegetable oil
- Food coloring
- Clear cup
- [Freshwater Dolphin Educator’s Resource Guide](#) (for reference)
- Five empty gallon containers (optional)

## Vocabulary

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- **Nonrenewable resource:** resource that cannot be replaced (at the same rate) after it is used (examples are coal, oil, and natural gas)
- **Renewable resource:** resource that can be replaced by nature (examples are solar, wind, and water)
- **Water cycle:** the series of conditions through which water naturally passes from water vapor in the air to being deposited (as by rain or snow) on Earth’s surface and finally back into the air, especially as a result of evaporation



*Rosan Mahara (left, 11) and Dipak Mahara (12) drink from the tap at the Jivanjyoti Lower Secondary School, which was rebuilt after being destroyed in a 2015 earthquake in northern-central Nepal.*



## ● Activity Procedure

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### Part 1: Introduction and Preparation

- Begin the discussion by asking students to identify where sources of salt water and freshwater are found. Students should understand that salt water makes up the Earth's oceans, while freshwater is found underground, in the air, and in other bodies of water like rivers, lakes, streams, and wetlands. However, the amounts of salt water and freshwater on Earth are far from equal. To demonstrate this ratio, take a large, clear container and fill it almost to the top with water. For an added effect, dye the water with food coloring. Tell students this represents the amount of salt water on Earth; salt water makes up almost 97% of all water. Now add just enough vegetable oil so that a thin visible layer is present on the surface of the water. The vegetable oil will represent the amount of freshwater on Earth, only 3%. Lastly, take a cup and scoop out about one-third of the vegetable oil floating on top of the water. Explain to the students that the water in the cup represents the freshwater that is accessible for the world to use. The remaining vegetable oil in the container is the freshwater that's unavailable, tucked away in frozen glaciers or as permanent snow.
- Now that students have an idea of how little freshwater is accessible and available, ask them to list all of the ways they can think of that they use water throughout the day. Typical responses involve drinking, brushing teeth, taking a shower, flushing toilets, and washing hands. When you contemplate how many ways each person uses water, and how many people exist on Earth, that's a lot of water! And humans aren't the only species that needs water. All living things require freshwater to survive. Freshwater supports more than 125,000 species, including freshwater dolphins. In order to help conserve these wildlife populations, we need to become more aware of our water usage behaviors.
  - The average American household of four uses 400 gallons of water a day. In some developing countries, families use as little as five gallons a day and must travel long distances to the nearest water source to collect each day's supply. Place five empty gallon containers (if available) on display for students to see, and ask them to imagine what they would do differently if this was the total amount of water available to their family each day.



## Part 2: Activity

This activity will have students thinking about their own water usage behaviors and ways to change them.

- If possible, arrange students into groups of four. Distribute copies of the attached handout, “A Drop in the Bucket.” Using the reference table on their handout, students will first individually calculate how much water they use during an average day. They should add up the corresponding amounts of water for each activity they perform throughout the day.
- Next, students will imagine their group as a family of four. As a group, the students should add up their individual totals to determine how much water they use each day as a “family.” Recalling the statistics mentioned in the introduction, have students reflect on their family total. Was their family total closer to 400 gallons or five gallons?
- It’s likely that their family total was relatively high, considering most American households are not limited in the amount of water available to them. This time, again using the reference table as a guide, have the students imagine they live in a developing country and only have five gallons to share between the members of their group. Ask the students to work together to determine how to minimize their water use so that they use only five gallons between them. This requires students to prioritize their water uses and strategize on how to effectively use water without being wasteful. Encourage them to convert units of measure when determining smaller amounts allocated for each activity, such as quarts or pints. If samples of these measurements are available, place on display for students to reference. Students can use the back of their paper, if needed, to write their proposed strategy.
- Once student groups have determined their water use plan, have them create a pie chart showing the percentages allotted for each activity. This will give them a visual reference when reflecting on areas in their own lives where they could potentially reduce their water usage.





### Part 3: Discussion and Assessment

- After the students have completed the activity, have them share their finalized water use plans and compare how each group chose to spend its water allowance differently.
- In this activity, students reflected on the amount of water they use in daily activities. But what about the hidden water? What many of us don't think about is the amount of water that goes into the processing of items you wear, eat, or drink. Products such as food and clothing items require ingredients that must be grown, harvested, selected, prepared, packaged, and transported. Each step of this process requires water. Share the following statistics with students:
  - 2,113 gallons of water are used to produce one pair of leather shoes.
  - 839 gallons of water are used to produce one cheeseburger.
  - 766 gallons of water are used to produce a cotton shirt.
  - 58 gallons of water are used to produce one egg.
  - 53 gallons of water are used to produce the sugar in one can of cola.
  - 1.5 gallons of water are used to produce a plastic bottle (not including the water inside it).

If this much water is needed to make one of each of these items, consider the quantities necessary to produce enough of these items for everyone in the world!

- So much water is required for the production of things we use and for performing many of our routine activities, it's important to make sure the Earth has enough water to go around. Review the water cycle using the definition provided in the vocabulary section of this activity. Students should understand that the Earth naturally recycles water through processes of evaporation, condensation, and precipitation. In order for the Earth to continue the cycle and provide water for everyone, water needs to eventually return to nature through the ground. When areas become overly developed, rainwater can gather on pavement rather than in soil or natural landscape, reducing the amount being recycled. Discuss ways to help conserve water by returning it to where it came from, such as using rain barrels to collect rainwater for outdoor use. You can find this example and others in the "What Kids Can Do" section of the [Freshwater Dolphin Educator's Resource Guide](#).



## ● Extended Learning Options

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- Enhance the discussion by having students debate whether they would classify freshwater as renewable or nonrenewable. Despite the massive role water plays for people and nature, it is a surprisingly limited resource. While it may seem that there is enough water to go around, we don't always have access to the quality and quantity of water we need. That's why every action we take and every choice we make impact the available water for our use in the future.
- Have students visit [www.watercalculator.org](http://www.watercalculator.org) to take a digital assessment of their water usage, incorporating a variety of goods and behaviors that contribute to it.
- Use a tablet or smartphone (if available) to download the [WWF Free Rivers app](#). Students can follow the route of water as it enters each stage of the water cycle and then watch what results when the water is either allowed to flow or blocked by dams.
- To learn more about freshwater dolphins and their habitats, download the [WWF Together app](#) and encourage students to explore the dolphin segment.
- Start a class fundraiser to protect freshwater dolphins and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at [pandanation.org](http://pandanation.org).

## ● Additional Background Info

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You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Article:** [The Impact of a Cotton T-Shirt](#)—how smart choices can make a difference in our water and energy footprint
- **Article:** [Green Tips](#)—lists simple ways to save water at home
- **Article:** [Capturing freshwater stories](#)—follows a WWF photographer as he documents the freshwater crisis around the world
- **Video:** [How Your T-Shirt Can Make a Difference](#)—a colorful video to accompany the above-mentioned article about hidden water uses in items such as t-shirts

For more fun classroom activities with a focus on wild species and conservation, visit [wildclassroom.org](http://wildclassroom.org).



# FRESHWATER DOLPHINS

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## A DROP IN THE BUCKET

Use the tables below to estimate the amount of water you use in an average day. Remember to consider the number of times you perform each activity throughout the day.

- \* My current average water usage is: \_\_\_\_\_ gallons/day.
- \* Now add up the total for your group (family). My family's current average water usage is: \_\_\_\_\_ gallons/day.

ACTIVITY	AVERAGE AMOUNT OF WATER IT USES EACH TIME
Bath	42 gallons
Shower (10 minutes)	25 gallons
Drinking water	0.5 gallons
Flushing a toilet	1.6 gallons per flush
Brushing teeth	1 gallon
Washing hands	1 gallon
Washing dishes by hand	17 gallons
Using a dishwasher	11 gallons
Washing clothes	40 gallons per load

- \* Imagine your family only has five gallons of water to use a day. How would you share it? As a group, develop a plan for how you would divide your water. Include a pie graph that shows the percentages of water assigned for each activity for your family.

**Conclusion question:** What could you do to reduce the amount of water you use?



Learning Activity:

## Dolphin Geography Flipbooks

<b>Activity Type</b>	Mini research project
<b>Focus Areas</b>	Social studies, language arts
<b>Time Required</b>	45–60 minutes

### ● Overview

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While most people associate dolphins with the ocean, both dolphins and porpoises can be found in major rivers across Asia and South America. The river basins where these freshwater dolphins live are also essential sources of livelihood for millions of people. In this activity, students will research what makes each species of freshwater dolphin unique and how dolphins share their watery homes with their neighboring human communities. To present their findings, students will design a neatly organized flipbook.

### ● Objective

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**At the completion of the activity, students should be able to:**

- Differentiate between various freshwater dolphin species, including their geographic location.
- Name several ways that freshwater is relied on by living things.
- Describe some of the existing challenges with the freshwater resources in these dolphin areas.



*A finless porpoise on the Oxbow Nature Reserve in Tian-E-Zhou, China, connected to the Yangtze River. This is a reserve for the endangered finless porpoise.*



## ● Subject and Standards

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### C3 Framework for Social Studies State Standards

- D2. Geo.2.3-5: Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics.
- D2. Geo.3.3-5: Use maps of different scales to describe the locations of cultural and environmental characteristics.
- D2. Geo.4.3-5: Explain how culture influences the way people modify and adapt to their environments.
- D2. Geo.6.3-5: Describe how environmental and cultural characteristics influence population distribution in specific places or regions.
- D2. Geo.8.3-5: Explain how human settlements and movements relate to the locations and use of various natural resources.
- D2. Geo.10.3-5: Explain why environmental characteristics vary among different world regions.

### Common Core Standards: English Language Arts

- RI. 3.5: Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.
- RI. 5.7: Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- W. 4.7: Conduct short research projects that build knowledge through investigation of different aspects of a topic.





## ● Materials Needed

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- Large index cards (8–9 per student)
- Hole punch
- Pipe cleaners
- Pencil
- Coloring utensils
- [Freshwater Dolphin Educator's Resource Guide](#) for reference
- Copies of "Freshwater Dolphin Species and Facts" handout included in this activity (optional)
- Internet access for student groups (optional)



*A fisher casts his net in the shallow lakes of the varzea, Ituqui Island, near Santarem, Para, Brazil.*



## Vocabulary

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- **Degradation:** the lowering capacity of an environmental area to supply products and other services due to internal changes that negatively affect its structure or function
- **Ecosystem:** the living (plants, animals, other organisms) and nonliving (air, water, soil) components of an area that interact with each other in an interconnected way
- **Fragmentation:** breaking down into smaller parts
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Habitat loss:** the disappearance of natural environments (required for plants' and animals' survival) due to harvesting for human consumption and/or clearing to make way for agriculture, housing, roads, pipelines, and other forms of industrial development
- **Pollution:** the act of contaminating an environment, especially with man-made waste
- **Sustainable:** of, relating to, or being a method of harvesting or using a natural resource so that the resource is not depleted or permanently damaged; an effective and innovative way to efficiently use natural resources and ensure their continued supply
- **Terms describing an animal's conservation status** (listed from lowest threat to highest):
  - **Not Evaluated:** a species that has not yet been assessed
  - **Data Deficient:** a species that cannot be evaluated because of insufficient information
  - **Least Concern:** a species evaluated to have a low risk of extinction
  - **Near Threatened:** a species that is close to meeting the threatened classification or that would be threatened if not for conservation efforts
  - **Vulnerable:** a species considered to be facing a high risk of extinction in the wild
  - **Endangered:** a species considered to be facing a very high risk of extinction in the wild
  - **Critically Endangered:** a species facing an extremely high risk of extinction in the wild
  - **Extinct in the Wild:** when a species is known only to survive in cultivation, in captivity, or as a naturalized population well outside the past range
  - **Extinct:** when there is no reasonable doubt that the last individual of this species has died
- **Watershed:** an area of land that catches rain or snow, which then drains into a river, stream, or other body of water



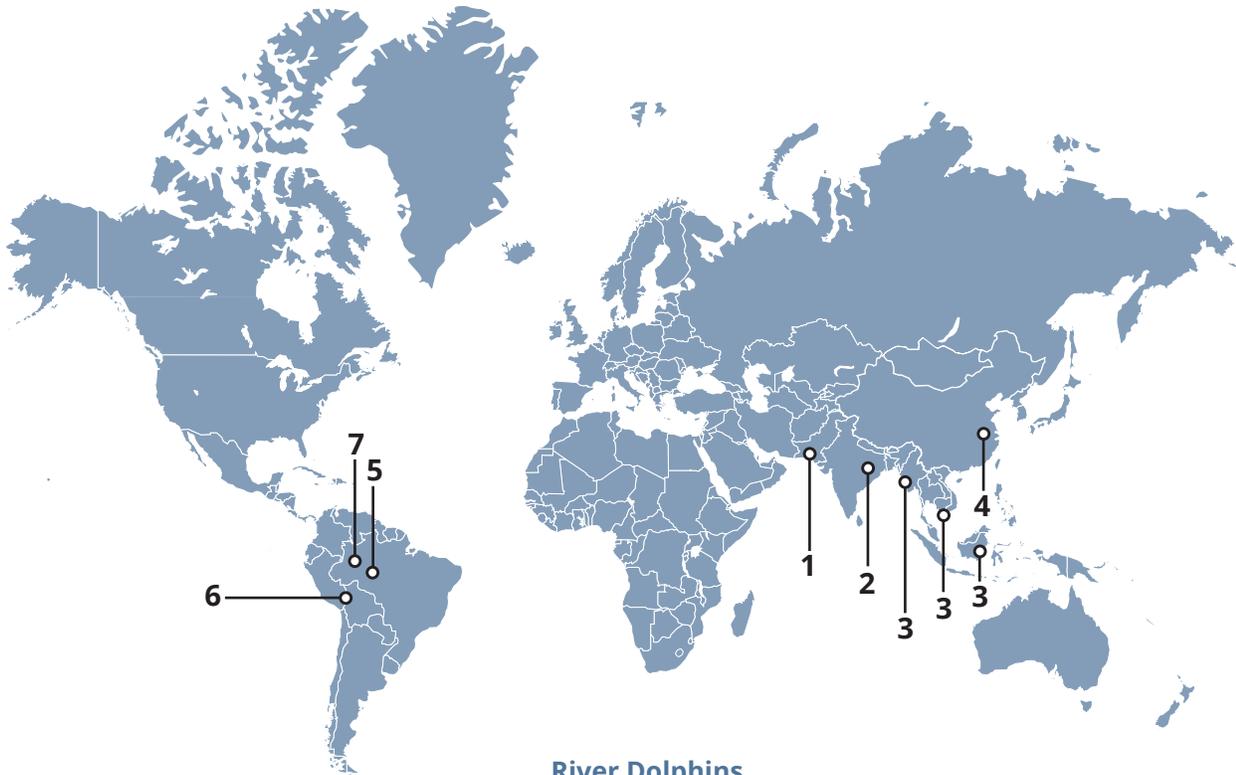
## ● Activity Procedure

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### Part 1: Introduction and Preparation

- Begin by asking students what they think of when they think of dolphins. As they are naming characteristics, some are likely to consider where they live and mention oceans. Inform students that some species of dolphins live in freshwater. Freshwater and marine dolphins have many things in common, but also many characteristics that set them apart, aside from where they live. Freshwater dolphins have poor vision while their marine relatives have very good vision. Freshwater dolphins also tend to swim slowly, rarely jumping out of the water. Marine dolphins swim fast and are seen frequently leaping out of the water. Each individual species of freshwater dolphin has also adapted unique traits and behaviors specific to their ecosystem.
- Now, focus the discussion on where freshwater dolphins live. While freshwater habitats can refer to a variety of waterways, the majority of freshwater dolphins are found in rivers and lakes in Asia and South America. These dolphins share their home with an immense number of species that depend on freshwater for survival. This includes not only the plants and animals living within the river or lake, but also the people living around it. The rivers that are home to these freshwater dolphins are also home to over 15% of the world's total human population.
- There are currently seven existing species of freshwater dolphin: the Indus river dolphin, the Ganges river dolphin, the Irrawaddy dolphin, the Yangtze finless porpoise, the Amazon river dolphin, the Bolivian river dolphin, and the Tucuxi. The Yangtze river dolphin, or Baiji, was declared extinct in 2006. Despite being separated by geography across South America and Asia, the seven existing species are united in a struggle for survival due to human-associated threats. Display the following map to familiarize students with the geographic locations where these dolphin species are found.





### River Dolphins

- |                             |                           |
|-----------------------------|---------------------------|
| 1. Indus river dolphin      | 5. Amazon river dolphin   |
| 2. Ganges river dolphin     | 6. Bolivian river dolphin |
| 3. Irrawaddy dolphin        | 7. Tucuxi                 |
| 4. Yangtze finless porpoise |                           |

Source: *"River Dolphins & People: Shared Rivers, Shared Future,"* WWF Publication

1. The Indus river dolphin is found in Pakistan.
2. The Ganges river dolphin is found in areas of India, Nepal, and Bangladesh.
3. The Irrawaddy dolphin is found in Myanmar, Cambodia, and Indonesia.
4. The Yangtze finless porpoise is found in China.
5. The Amazon river dolphin is found in areas of Venezuela, Colombia, Ecuador, Peru, Brazil, Suriname, and Guyana.
6. The Bolivian river dolphin is found in Bolivia.
7. The Tucuxi is found in Colombia, Ecuador, Peru, and Venezuela.



## Part 2: Activity

In this activity, students will make index card flipbooks of researched information on the seven surviving species of freshwater dolphin and the people who share their habitat. In preparation, it may be helpful to punch holes in index cards prior to the start of the activity. Each index card should be hole punched in the top-left corner so that a pipe cleaner can be looped through and tied. The pipe cleaners can also be cut; each student will only need a small piece, a few inches long.

- Distribute materials to each student. With one index card for each species of freshwater dolphin, every student should have a total of eight cards (including a cover). The WWF website [Freshwater dolphin species and facts](#) is an excellent resource for information for their flipbooks. If access to technology is not available, a handout containing the information found on this website is available at the end of this activity.
- Students should assign one index card for each freshwater dolphin species. The criteria to be researched and included for each dolphin can be on display for students to reference or in the form of a handout:
  - Name of freshwater dolphin
  - Current extinction status
  - Fun fact
  - Rivers where they're found
  - Countries where they're found (recall geography review from the introduction)
  - Biggest threats
- It's recommended that students write the name of the dolphin with an illustration on the front of each index card and include brief answers to the research questions on the back. Students can be creative with the design of their flipbook.
- Once students have completed their cover page index card as well as the seven research cards on each species, they should thread their small pipe cleaner through the holes in the cards, tying it into place.



### Part 3: Discussion and Assessment

- As a review, have students recall from their research some of the threats currently facing freshwater dolphins. In many parts of the world, access to clean, freshwater is one of the biggest challenges, and as human populations continue to grow, so does the demand for water. Without necessary practices in place to responsibly manage these resources, the waterways are becoming overused, polluted, degraded, and fragmented. This impacts the humans that rely on that water, as well as the other animal species, like dolphins. Have students share some examples of ways they use freshwater at home or at school. When they consider the many uses of water every day in conjunction with the number of people in the world, they should reflect on the importance of having sufficient amounts of clean, freshwater.
- Have students recall some of the countries where these freshwater dolphin species are found. Many of these countries are among the most populated countries in the world. China, the most populated, has almost 1.4 billion people, and India, the second most populated, has almost 1.3 billion. Indonesia, Brazil, Pakistan, and Bangladesh are also a part of this list, with between 160 and 260 million people. Referring back to the conversation about ways people use water, have students consider the amount of water that would be required to support these populations of people. When the needs for water outweigh the quantity that is available, the species that call the water home, like these dolphins, are at risk of losing their habitat.
- It's important to recognize where your water comes from in order to do your part to responsibly care for and share it with other species that also depend on it for survival. Inquire if students know where their freshwater comes from. A commonly heard response may be "the tap" or "the faucet." Water travels a long journey before it reaches our homes. Define *watershed* using the definition provided in the vocabulary section of this activity. Every community around the world has an identified watershed that is its source of freshwater. However, nearly one-fifth of the world's population lives in regions where water is scarce, and another nearly 1.6 billion people (almost one-quarter of the world's population) are unable to access the water that is available. Discuss with students the importance of watershed management in terms of both quantity and quality, in order to provide for the people (and animals) that depend on it.
- Explore your own watershed by checking out [Surf Your Watershed](#). Have students consider the number of people and the number of uses for which their watershed needs to provide. If they discover their watershed is in trouble, encourage them to think of ways they could help. Examples can be found in the "What Kids Can Do" section of the [Freshwater Dolphin Educator's Resource Guide](#).



## ● Extended Learning Options

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- Give students the option of creating an additional page to their flipbook for the Yangtze river dolphin, or Baiji, that was declared extinct in 2006.
- To better gain perspective on the geography and people that share the waterways of these dolphins, challenge students to perform further research on the countries where these dolphins are found. This information can be found on the [WWF website](#).
- Start a class fundraiser to protect freshwater dolphins and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at [pandanation.org](#).
- Use a tablet or smartphone (if available) to download the [WWF Free Rivers app](#). Through augmented reality, students can interact with a freshwater habitat and discover how much people and wildlife depend on the health of these rivers.
- Also available for download is the [WWF Together app](#). Encourage students to explore the dolphin segment, which uses maps and other tools to take a closer look into the life of these creatures.

## ● Additional Background Info

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You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Article:** [Freshwater dolphin species and facts](#)—brief informative passages broken down by species
- **Article:** [Indus river dolphin numbers on the rise with the help of local communities](#)—tells of how local people have contributed to this species making a comeback
- **Video:** [River Rangers Protect Irrawaddy Dolphins](#)—a short clip showing how river rangers are helping save Irrawaddy dolphin populations

For more fun classroom activities with a focus on wild species and conservation, visit [wildclassroom.org](#).



## FRESHWATER DOLPHIN SPECIES AND FACTS

### Amazon river dolphin

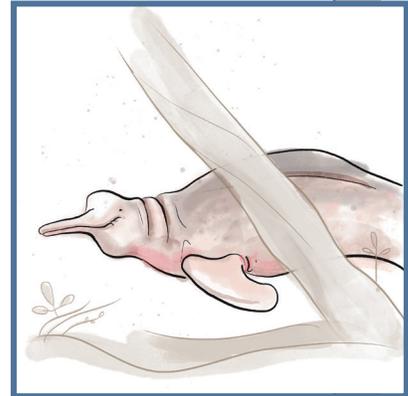
*Inia geoffrensis*

#### Population

*Unknown, but likely in tens of thousands*

#### Status

*Vulnerable*



Also known as the *boto* or “pink river dolphin,” the Amazon river dolphin swims throughout much of the famed South American river basin and the neighboring Orinoco river basin that stretches through Colombia and Venezuela. The species is characterized by its long snout and pale pink color.

#### THREATS

Like its relatives elsewhere, the Amazon river dolphin faces challenges from development projects. Dam construction fragments populations and limits the species’ range and ability to breed. Pollution, including mercury, also impacts these dolphins. They’re also often deliberately killed for use as bait in the mota catfish fishery, which gathers fish that demand high prices in cities.

#### WHAT WWF IS DOING

WWF is using quadcopter drones to track and count Amazon river dolphins—a method that’s swifter and potentially more accurate than traditional monitoring by humans. We’re also developing a joint regional approach among Bolivia, Peru, Colombia, and Brazil to protect the species across borders.



## Bolivian river dolphin

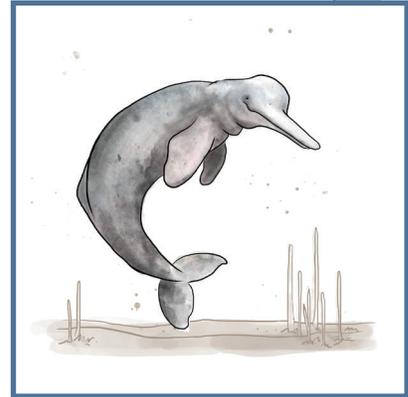
*Inia boliviensis*

### Population

About 5,000

### Status

*Vulnerable* (according to the Red Book of Vertebrates of Bolivia)



The Bolivian river dolphin lives in streams and lagoons in the Bolivian Amazon, and is slightly smaller than the nearby Amazon river dolphin. Rapids and waterfalls between Bolivia and Brazil keep the two species from mingling and breeding, thus forming two independent lines of genetics. They have a very flexible body that varies in color from pale gray to intense pink.

### THREATS

Bolivian river dolphins can become entangled in fishing nets, or killed and used for bait. They also face the threat of mercury contamination from mining. The construction of hydroelectric dams could also have a negative effect, and inadequate conservation policies put them at risk.

### WHAT WWF IS DOING

WWF is helping to coordinate actions to protect the Bolivian river dolphin, learn more about the species, and preserve aquatic habitats so both dolphins and humans can thrive.



## Tucuxi

*Sotalia fluviatilis*

### Population

*Unknown*

### Status

*Data Deficient*



The Tucuxi is the smaller, gray counterpart to the Amazon river dolphin. The freshwater species is found throughout the Amazon and Orinoco river basins, and its marine subspecies lives in estuaries and bays along coasts, stretching from Brazil to Nicaragua. The Tucuxi travels in groups and, unlike the Amazon river dolphin, jumps out of the water.

### THREATS

Development—such as the construction of dams—continues to challenge Tucuxi populations by fragmenting their range and limiting breeding opportunities. Scarcity of migratory fish upon which the Tucuxi feeds also poses a threat.

### WHAT WWF IS DOING

The primary thing we need to do for the Tucuxi is gather an accurate count of the population. WWF is using quadcopter drones to spot and count individuals in the Brazilian Amazon, beginning the process of capturing much-needed data to better determine further actions needed.



## Ganges river dolphin

*Platanista gangetica*

### Population

2,500–3,000

### Status

*Endangered*



The Ganges river dolphin—also known as the Ganga—inhabits parts of the Ganges, Meghna, and Brahmaputra river systems in India, Nepal, and Bangladesh. Known locally as *susu*, which refers to the noise the dolphin is said to make when it breathes, this swimmer is essentially blind and can detect only the direction of light.

### THREATS

Living in one of the most densely populated parts of the world, the Ganges river dolphin faces threats from agriculture and industrial pollution and other human activity such as dam creation, irrigation projects, and fishing. This development activity divides and isolates populations, significantly reducing its range.

### WHAT WWF IS DOING

We can't protect the Ganges river dolphin without the help of local communities. That's why WWF works with people who live along a vital stretch of dolphin habitat to use natural fertilizers, not dispose of domestic sewage in the river, reforest the riverbank, and ban commercial fishing and sand mining activities. We're also working with the leather industry to reduce pollution upstream of dolphin habitat.



## Indus river dolphin

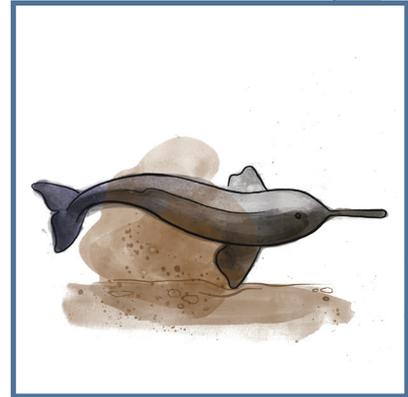
*Platanista gangetica minor*

### Population

Approximately 1,800 to 1,900

### Status

Endangered



Known locally as the Bhulan, the Indus river dolphin now swims in the lower parts of the Indus River in Pakistan. Another small, isolated population can be found in the Beas River in India. These dolphins rely on echolocation to navigate, communicate, and hunt prey in the muddy river waters.

### THREATS

Beginning in the 1930s, the construction of numerous dams and barrages led to the initial decline of the Indus river dolphin by splitting the population into small groups, degrading their habitat, and impeding migration. The dolphins sometimes get trapped in fishing nets, stranded in irrigation channels, and face the dangers of pollution.

### WHAT WWF IS DOING

WWF works to conserve a viable population of Indus river dolphins and protect its habitat. We also take part in rescue missions when individual dolphins become trapped in irrigation canals. There's even a river dolphin hotline in Pakistan that people can call when they see an animal in trouble.



## Irrawaddy dolphin

*Orcaella brevirostris*

### Population

*Unknown, decreasing*

### Status

*Critically Endangered*



The Irrawaddy dolphin traverses three rivers in South and Southeast Asia: the Irrawaddy, the Mahakam, and the Mekong. Featuring a bulging forehead and short beak, this gray animal will pop its head out of the water to breathe, followed by its back; the tail is rarely seen.

### THREATS

Unsustainable fishing practices remain the principal threat to the Irrawaddy dolphin. The species is not directly exploited, but can accidentally end up in fishing gear intended to capture other animals. Habitat degradation and population fragmentation due to dam development also impact the dolphins.

### WHAT WWF IS DOING

In addition to conducting research to learn about dolphin mortality, population, and ecology, WWF teaches local communities about dolphin and environmental conservation. We've developed community fishery management zones to help sustainably manage fish and prevent dolphins from accidental capture in nets and other equipment. River guards also help track the dolphins and enforce sustainable fishing practices to help the population.



## Yangtze finless porpoise

*Neophocaena asiaeorientalis*

### Population

1,000

### Status

*Critically Endangered*



The Yangtze finless porpoise lives in the Yangtze River, the longest river in Asia. At one point, this porpoise shared the waters with the Baiji—a species declared functionally extinct in 2006. The Yangtze finless porpoise is known for its mischievous smile, and its intelligence level is on par with a gorilla's.

### THREATS

Dredging, pollution, and boat strikes from shipping and transportation on the river threaten the finless porpoise. Sand mining and illegal fishing also impact the species.

### WHAT WWF IS DOING

In 2014, the Chinese government gave the Yangtze porpoise the strictest protections available by law. WWF works with the government to relocate porpoises to safer parts of the river where they have a better opportunity to thrive. We also help fishers along the Yangtze River find feasible alternatives for income generation. The shift in livelihood helps develop the economy, stops overfishing, and gives communities a central role in saving an iconic species.