PONDS AND RIVERS

One glance at a pond you can tell it's really different from a river. If you were a creature living in a pond, what would your world be like? What if you were a creature living in a fast, gurgling, river? How would your world be different? If you slowed down and made comparisons, you could probably make a long list! Learn some simple measurements you can make to compare two different types of water where plants and animals live.

**Time:** 40-minute activity

**Materials:**
- You and your skills of observation
- A piece of paper in a notebook or on a clipboard
- A pencil or pen
- Some way to measure turbidity:
  - Your own eyes, or
  - A clear, plastic jar, and your own eyes, or
  - Your own homemade secchi disk on a string!
- A watch with a second hand
Directions:

1. With an adult, find two places outside that have water where plants and animals live. Choose two really different types of places, like a pond and a fast-moving stream or small river. Can you find a place like that in a city park, or someplace more wild? Be sure to stay safe around water as you explore.

2. Head to your pond or river and have a long look. What do you notice with your eyes, ears, and nose? Write down your impressions on your piece of paper. Use as many descriptive words as you can.

3. Time to make measurements about the abiotic (nonliving) factors of the water! How do you think the water will feel when you touch it with your hand? Icy like an ice-cold drink? Refreshing like jumping through a sprinkler in summertime? Comfortable like a warm bath? Hot like hot cocoa? Write down some words to describe your experience. You’ve described the temperature!
4. Is the water clear or murky? Scientists use the fancy word turbidity to describe how clear or hazy water looks to our eyes. Drinking water from a drinking fountain is clear. It has really low turbidity. Water from a pond can be hazy or murky. It has much higher turbidity. Without disturbing the bottom of the pond or river that you’re sampling, can you measure how clear the water is? You can try one of three ways:

a. Look down into the water from the shore. Can you see the bottom? How far down into the water do you think you can see? A few centimeters, ten centimeters, a meter, more?

b. Look through water you scoop up into a clear, plastic container. As you look through one side of the container to the other, can you see your hand holding the container clearly? Is the water hazy enough to make your hand look blurry?

c. Look down into the water at a secchi disk. Scientists use secchi disks to judge the turbidity of water. Make your own at home! With a dark marker, divide a light-colored plastic lid from the recycling bin into four equal pie-shaped sections, coloring every other section black with a permanent marker. Your homemade secchi disk now has two sections that are black, and two that are light in color. Punch a hole in the center of the disk, and attach a piece of string by tying a knot in one end and threading the other through the hole in the center. With help from a friend, have one person hold the string, and the other slowly lower or guide the secchi disk deeper and deeper into the water until the secchi disk gets blurry. Stop! How far did you lower the secchi disk? You can measure the length of your string to find out.

d. Whatever method you choose, the clearer the water, the lower the turbidity. The hazier the water, the higher the turbidity. Well done! You’ve described turbidity!
5. What is on the bottom of your watery place? Can you describe what's there? Is it sandy or gravelly or covered with big stones? If you walk into the water up to your knees, do your feet sink into muck? Do they get tickled by plants? Does it feel slimy or gritty or hard like a stone? You've described the substrate of your watery place!

6. Find something nearby made by Nature that floats, like a stick or a pinecone or fat blade of grass. What do you think will happen when you place it on the surface of the water? Does it sit still? Does it move quickly? Can you measure how fast your piece of Nature moves from one place to another? That's a measure of velocity!
7. Make one more measurement. How much oxygen do you think this water holds? Scientists use special equipment, but you can learn a lot with your eyes. How many bubbles can you count? A few? Dozens? Too many to count? Is the water still or moving fast? Is it tumbling over obstacles like rocks or logs? Water that has few bubbles and is still, will have far less oxygen than water that is moving fast and tumbling over obstacles. Your observations tell you about oxygen levels in the water!

8. Time to discover living creatures, like this damselfly larva! What sorts of creatures can you find living in or on the water? What kind of creature features do you think they have? What about their bodies or movement or behavior do you think makes them able to live well in this watery place?

9. Now visit your other watery place where plants and animals live. What do you think you will find? How will it compare to your first place with water? Be sure to measure in the same way in both locations so you can make good comparisons. How are the bodies, movements, or behaviors of living creatures the same or different between these two places? You’ve compared two waterways!
Wonder Why with Nature WY…

As you explore your pond and river, what else could you measure to describe how different these two places are? What do you wonder about?

What do you think happens to the temperature of water from spring to summer to fall? Does it change over time? Do you think other abiotic factors change over time? Make some predictions, then return to the same body of water over time. Were your predictions right? Why or why not?

What happens to the turbidity of water as you walk along the bottom of your watery place? Does the same thing happen in both a pond and a river? What sorts of natural events do you think might increase turbidity?

Think about the creature features that are the same for organisms living in different watery places like ponds and rivers. How are those features different from those you have, as an organism that lives on land? Goggles, snorkels, air tanks, and flippers help you move better through water. If you were an inventor, what could you create to help an aquatic organism live for a while on land? Can you draw your invention?

Wonder about the organisms you found as you investigated your pond or river? Try using Seek by iNaturalist to help you identify the living creatures you discovered. Or head to the library for a field guide on creatures that live in aquatic places.

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