



# Pond Life: A Busy Ecosystem

Activities for children and  
adults that build upon PlayTrail  
experiences outdoors



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## Activities for children and adults that build upon PlayTrail experiences outdoors

Getting children comfortable in the outdoors may be one of the greatest gifts we can offer the next generation. Given what we know about the physical and psychological consequences of a sedentary, electronic media-dominated lifestyle, it also might be one of greatest health tips we can offer. A childhood rich in outdoor experiences provides an inexpensive antidote for a number of medical problems, including depression, attention deficit disorder, and obesity.

But there is more. Letting young children freely explore their world outdoors can instill a lifelong connection to the environment. It can also help cultivate an ethic of caring for the environment.

The role of adults in this process focuses less on teaching and more on coaching. While most children want to explore their world, some may be hesitant or even fearful. Parents and other caregivers need to be there to offer encouragement and guidance without stifling the important work called play.

# Tips for adults

We offer the following tips to help make the most of your PlayTrail explorations.

1. Find activities in these booklets that are appropriate for your child's age and interests, as well as environments that are readily accessible to you.
2. Share the booklet with your child in advance.
3. Let your child initiate the exploration, but be ready to offer suggestions in the event encouragement is needed. Consider the booklet's investigations to be jumping-off points that pique curiosity.
4. Avoid the tendency to teach. Share the information you glean from these booklets as "incidental" points of interest.
5. Model positive behaviors and respectful attitudes toward nature.
6. Respect your child's fears. Never force a child to touch something they do not want to touch. Courage and interest come about through positive, graduated experiences.
7. Foster play and accept the fact that dirty hands, mud-caked shoes, and wet clothes often come with it.
8. Avoid the tendency to "helicopter." Too often we over-protect and stifle explorations inadvertently.

## A Life Meant for the Water

A pond is a busy place—an ever-changing world of animals that swim, skate, crawl, and fly. Some animals spend just part of their lives in the water. Others never venture out of it. A pond offers abundant food, a nursery for young insects and amphibians, a haven for fish and turtles, and a fast-food restaurant for animals on the go.

Pond animals, like other animals, can be grouped as vertebrates and invertebrates. Vertebrates have backbones and invertebrates don't. Their skeletons are located on the outside of their bodies. If you look closely at a pond, you likely will see just invertebrates. Water striders skate across the water surface, while beetles swim under the water, away from the reaches of hungry nymphs that crawl along the bottom. As for the vertebrates, often you just see the clues they leave behind, like their tracks or the remains of a meal.

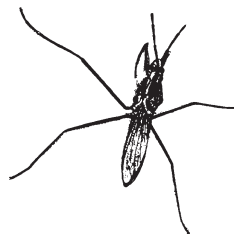
There are several pond-based activities in this book. You may want to do all of them during one visit to a pond. When you done, make sure you return all of the animals you collect to the water.

**Safety tips:** Adults need to be present for all activities near water. Also, avoid handling aquatic insects since some can bite.

## Pond safari

To understand a pond, you need to study it layer by layer. Equipped with a white dishpan and dip net (or kitchen strainer), and dressed in clothes and shoes that can get dirty, take your child to a nearby pond or stream. Fill the dishpan half full with pond water and set it down on the bank. Search the water's surface for water striders. If you find one, carefully scoop it up with the dip net or strainer and place it on top of the water in the dishpan. Watch how it moves.

A water strider's body is covered with hundreds of oily hairs that hold air bubbles. The bubbles keep the strider's body afloat. Its legs touch the water, but never break the surface tension. A water strider appears to skate on the water, using its middle and back pairs of legs to paddle and steer.



Search beneath the water's surface for whirligig beetles and water boatmen. Carefully scoop up a couple and place them in the dishpan. Whirligig beetles swim in circles near the water surface, relying on a bubble of air under their wings for their oxygen supply when they dive. Water boatmen use their long hind legs like oars. When they dive, their air supply comes from an air bubble held against the underside of their body.

# Waterborne Life Cycles

Do you remember climbing on the fish climber, pond turtle spinner, frog climber, and dragonfly model in the Playpod? Each of these animals depends on a pond or other freshwater environment for at least part of its life.

Fish spend their entire life underwater, from the time they are a tiny egg to adulthood. They rely on gills rather than lungs to breathe.

Some turtles spend their entire life in or near a pond or stream. They lay their eggs in moist sand. Hatchlings and adults have lungs, so they need to come to the surface to breathe.

All frogs spend part of their lives in water. Their eggs are laid in water and the larvae that emerge, or tadpoles, have gills. As tadpoles transform into adult frogs, their gills give way to lungs.

All dragonflies spend part of their lives in water. They lay their eggs in water and the nymphs that emerge have gills. As nymphs transform into adult dragonflies, they leave the water and take to the air.

Search the pond or stream for fish, turtles, tadpoles, frogs, or adult dragonflies.

Place a checkmark on this chart when you see each animal.

Fish	Turtle	Tadpole	Frog	Dragonfly

## Damselflies and dragonflies

Damselflies and dragonflies are remarkable animals. With a head full of eyeballs, powerful jaws, and a long body, these insects look fearsome. To a midge or mosquito, they are. To us, they are tiny though powerful flying machines that do us a huge favor by controlling insect populations.

Damselflies look different from dragonflies. They are smaller and more slender. Their eyes are positioned more on the sides of their head. Their hind wings are the same size as their forewings. When they rest, the wings are folded and parallel to the body. When dragonflies rest, their wings are held out to their side, perpendicular to the body.

Both damselflies and dragonflies lay their eggs in the water. When the eggs hatch, nymphs emerge. Dragonfly nymphs lack the feather-like gills of damselfly nymphs. What they do have, however, is a lower lip equipped with sharp, jagged teeth or bristles they use to hook their prey.

## Spotting the difference

Continue your pond safari, but for this activity, sit quietly at the edge of the pond or stream where there is tall vegetation like cattails. Dragonfly-watching is best done on a calm and sunny day. If you see something like a dragonfly land on a stalk, encourage your child to join you in slowly walking straight (not crosswise) towards it. Try to get close enough to study its body shape and determine if it is a dragonfly or a damselfly. If it is resting, pay attention to its wing position. Next, notice its markings. What color is its abdomen? Its head? The veins on its wings?

Record your observations.

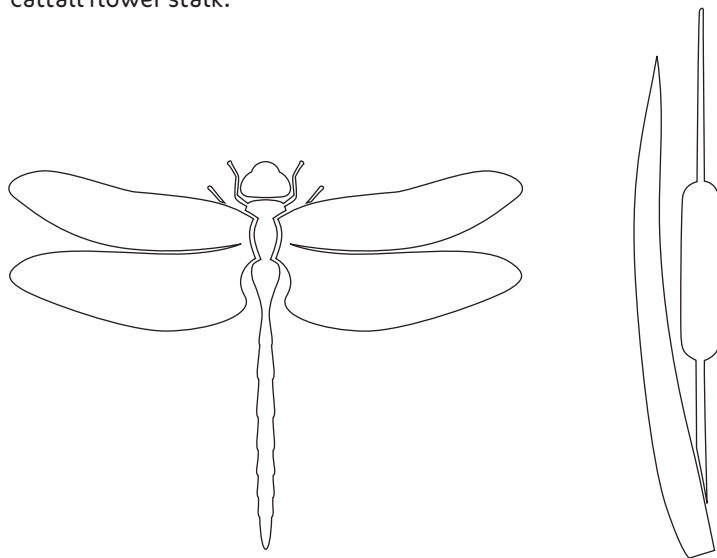
Insect type	Body length	Wing color	Abdomen color

When you return home, do some research to figure out which dragonfly or damselfly you might have seen.

## Dragonfly model

**Material:** scissors, crayons or markers, tape

**Procedures:** Cut out the drawing of the dragonfly and cattails. Have your child color both pieces. Tape the dragonfly onto the cattail flower stalk.



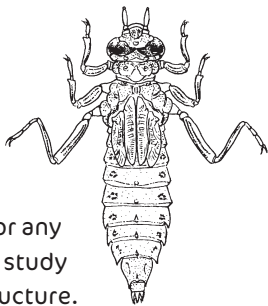
## Cradle of life

The floor of a stream or pond serves as a nursery for many aquatic insects. The nymphs of dragonflies, damselflies, mayflies, stoneflies, and others walk, cling, or crawl along the bottom. Some nymphs feed on plant matter. Others grab food as large as a tadpole or small fish. Eventually these nymphs will leave the water, shed their skin cases, and take flight as winged adults.

## Sifting through muck

Continue your pond safari, this time looking only at the bottom of the pond or stream. Use the dip net to skim the bottom and empty your catch into the dishpan. (Before you do this, return all specimens you have collected back to the water.) Wait a couple of minutes for any nymphs to start to wiggle. Once they do, study their movement as well as their body structure. Can you tell the difference between the nymphs of dragonflies and damselflies?

When you're done, make sure you return all of the animals you collect to the water.



## Citizen Science

Biologists conduct large research studies to catalog how many different kinds of plants or animals exist regionally or even nationally. Sometimes they just focus on one particular species or habitat. Often they ask for help because the scope of their research is so large. “Citizen science” invites individuals to record their observations about a certain organism or factor on a website. By doing this, ordinary people contribute important information to a central database that is analyzed by trained biologists.

There are several pond-based “citizen science” projects your family can become involved in. For example, the USA National Phenology Network is tracking climate change and wants information on whether ponds are ice-free all year. Other projects focus on inventorying pond life as a measure of water quality, surveying toads and tadpoles, and monitoring vernal pools in the spring. The best way to find out about active ones in your area is to look them up on the Internet or check them out at [www.thedailygreen.com](http://www.thedailygreen.com). These projects often are conducted by natural history museums, nature centers, and national parks.

**Conservation message:** Ponds are valuable wetlands. Protecting their water ensures a healthy habitat for the plants and animals that call them home.

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*Bees: fantastic farmers*

*Birds: engineers by instinct*

*Butterflies: the magic of metamorphosis*

*Forest filtration: nature's air filter*

*Habitats: there's no place like home*

*Leaves: hidden colors*

*Spiders: silk spinners*

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