

# POND STUDY

Activity 28

AGE LEVEL = 9-15 (7-8)  
DURATION = 45-75 min.  
LEARNING STATION = Pond/Lake  
RELATED ACTIVITIES = None

WHEN =



**UNDERSTANDING:** Pond communities offer an interesting variety of interrelated animal and plant life that often goes unnoticed.

**SPECIAL NOTES:** Have one leader for every six to eight children. If you plan on using Pond Study on a regular basis, cut out and laminate the pond critter identification cards and store them with your materials. You can either put one critter per card, or make two-sided copies, and have two critters per card.

## MATERIALS:

For each pair of children:

- Set of *Pond Critter Identification Cards*
- Magnifying glass, hand lens, or bug box (optional)
- Plastic water containers (i.e., cups, bowls)
- Plastic spoons
- Kitchen strainer
- Creature Sheets

For the group:

- 2 Dip Nets
- White pans
- 5-gallon holding pail (for frogs, fish, salamanders, crayfish)
- Paper and colored pencils or crayons

**PREPARATION:** Gather materials. Familiarize yourself with the identification cards. Photocopy creature sheets and Pond Critter Identification Cards. If possible, visit the pond or lake site and look for the best collecting sites (i.e., least mud, low slope, no dangerous holes, etc.). Also, set and mark boundaries of collection area.

## LESSON:

**Warm-up:** If possible, begin the lesson at the lake or pond. Start with a story, such as “Moving Water” to help set the stage for the activity. (See the end of this card.)

**Activity:** Question the children: What nonliving component of a pond do the animals and plants adapt to? (Water.) Then note that they will learn how these organisms live so successfully in a watery world. Tell the group that they will be exploring five of the many neighborhoods in the pond: shoreline, pond surface, open water, shallow water and air above the water.

Discuss how the five pond neighborhoods are homes for living things that have adjusted to survive. Note that each organism plays a special role that makes the pond community healthy. Explain that the group will be examining these organisms and learning about their jobs.

Have the children pair up, and stress the buddy system for safety. Demonstrate how to use the equipment, then pass it out. Show the children the boundaries that you have chosen and stress the importance of staying within them. Allow them 30 minutes to search for interesting creatures. Remind them to be gentle. Encourage them, but don't identify the creatures they collect until later. That way, they'll be more intrigued and examine unique characteristics more closely.

Wrap-up: Convene the group and sit in a circle. Hand out paper, pencils and the Pond Critter Identification Cards. Have each child choose two different animals of interest. Have them draw the pond animals and name them based on their characteristics (i.e., Wingless Big Eye = Dragonfly nymph). Then let them look at the Identification Cards and answer the questions on the Creature Sheets. Allow 20 minutes. Have each child share a creature, its name, home, job and the drawings.

If time permits, lead Activity 36 - The Web of Life using pond creatures the children collected. Or add other pond organisms: mammals, birds, fish, reptiles and amphibians.

#### OPTIONS AND FURTHER EXPLORATIONS:

1. Take water samples at different times of the day and year.
2. Use a few plants and animals to create a pond aquarium. Watch closely for interactions among species (artificial aeration is usually necessary).

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### MOVING WATER STORY

It's a sunny day. Can you feel the warm rays of the sun heat up your body? It's not hot, but pleasantly warm. For seconds now you have been feeling the warmth against your cheeks, arms, fingers, nose and all over. The warmth is comforting.

Then you notice that you have been getting smaller and smaller. You are no bigger than the head of a pin. Now you are moving. What's most surprising is that you are not on land, and you are not walking. Instead, you are floating on your back in water. You are floating very slowly.

Then you notice a momentary chill as a cloud blocks the sun. Soon, however, the sun is back and it's warmer than ever. Actually, the sun is getting so hot that you begin to sweat. Before long, you feel like you're melting, and even though you didn't think it was possible, you are disappearing. You become an invisible gas turning quickly head over heels upwards. It's almost as if a magnet is pulling you closer and closer to the sun. You start believing that nothing will keep the sun from melting you as you rise mile after mile into the sky. But something does: cold air.

At first the cold air is refreshing, but soon you wish you had brought a windbreaker — and a hat, and mittens. Before long you wish you had a winter coat. You are cold. Others like you have linked up with you. You try to brush them away, but every time you move, several more join up. What's really aggravating is that you can't see them.

Now, almost as fast as you were rising, you and all your invisible friends start to fall. You are falling so rapidly you can hear the wind whistling. As you near the ground, you and your invisible friends become visible and lose your bonds. You are also getting warmer. You have been falling now for minutes and just as you begin to wonder if you'll ever stop falling, you hit a leaf of a maple tree. You hit the leaf so hard that you are thrown back to a branch and from there to the trunk until you are safely back on the ground.

But there is no rest for you, yet. Just when you were getting a breath of fresh air, you are swept away in a flood. You hold your breath. Again you're being tumbled head over heels, but this time you are underwater. Almost as fast as you were swept away, you find yourself back in the water you started from, floating quietly.

In the last few moments, you have experienced what it's like to be a water droplet passing through the water cycle. Without water drops, we would not have ponds. And without ponds, we would not have the fascinating animal and plant life that make up the pond community. When you are ready to return to your normal self, slowly open your eyes and join us as we go pond exploring.

### CREATURE SHEET

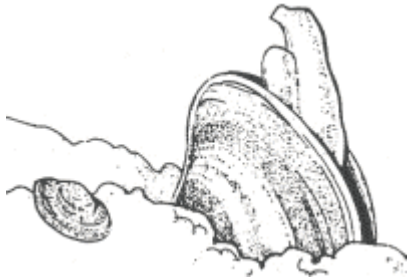
Try to answer these questions about the pond critters you found:

1. Who am I? \_\_\_\_\_
2. What do I eat? \_\_\_\_\_
3. Am I a carnivore? herbivore? omnivore? scavenger? parasite? \_\_\_\_\_
4. How do I breathe? \_\_\_\_\_
5. How does my shape help me survive? \_\_\_\_\_
6. Does my existence tell you anything about the condition of the water? \_\_\_\_\_  
\_\_\_\_\_
7. If my species disappeared from a pond, would that affect the other forms of life still there? If so, how? \_\_\_\_\_  
\_\_\_\_\_

# POND CRITTER I.D. CARDS

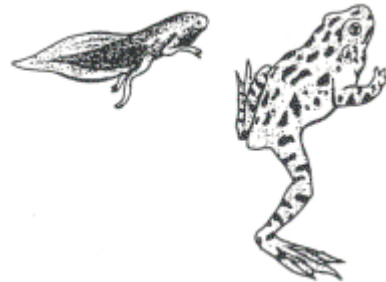
## CLAM

Ever think about what it's like to be a clam? Well, try to imagine living underwater, within a shell, without eyes, with only one foot to get around, catching your food with your nose. That's living like a clam. Our hard shells help protect us from animals like raccoons, turtles and muskrats who enjoy eating us. See those rings on my shell? Each ring equals one year's growth. Can you count my rings and guess my age? I use my foot, which looks a lot like your tongue, to pull myself along the bottom of rivers and lakes where I live. I catch tiny plants and animals, called plankton, in my gills as I breathe. I can live only where the water is clean. Do you think clams are common in Maine ponds and lakes?



## LEOPARD FROG

Have you ever thought about what it would be like to start out life swimming and end up hopping? Well, that's what I do. After hatching from an egg, I spend several months as a tadpole, swimming with my long tail, eating algae, and hiding from hungry dragonfly nymphs, newts, fish and birds. I slowly grow legs, and my tail gets smaller, and I start breathing with lungs instead of gills -- I am now a frog! I like to live near ponds, and in wet meadows and woods where I can find lots of crickets, ants and other insects to eat.



## CRAYFISH

You have probably seen crayfish before, but have you ever wondered what it's like to be one? Imagine having only two fingers on each hand, your eyes sticking out from your face on stalks, and your skeleton on the outside of your body. Crayfish, like me, are an important part of the clean-up crew where we live. We not only eat living plants and animals, but decaying ones as well. If it wasn't for us, dead plants and animals would pile up on the pond bottom. Because so many animals find us good to eat, we stay hidden during the day and come out only at night. If an enemy does find us, we make a fast getaway by swimming backwards. Just like a fish, we have gills that allow us to get oxygen from water. We need clean water to survive.



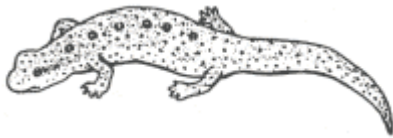
## LEECH

Have you ever considered sitting down at a table and feasting on a bowl of blood and decaying animals? If so, you've thought about eating like a leech. Leeches, like myself, enjoy drinking blood, but when times are tough and we can't find a host, we eat decaying animals. My suckers, which are like suction cups, enable me to hang on tightly to an animal. I use my sharp teeth to scrape open a little wound so I can drink the blood that flows out. Since my meals are at the expense of other animals, I am called a parasite. I do not have gills or lungs; I simply breathe through my skin.



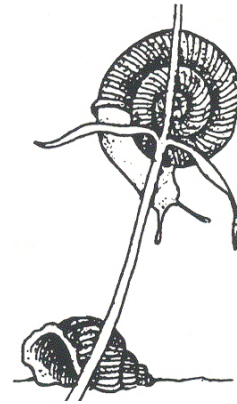
### RED SPOTTED NEWT

Like all amphibians, I start out life living in the water, first as an egg, then as a larva. I look like a miniature salamander when I am a larva, except that I have gills on the sides of my neck so I can breathe underwater. I like to eat frog eggs, worms, leeches, spiders and insects. After a few months, I change into a red eft and leave the water to live in moist leaves, stumps or fallen trees in the forest. After several years, I change again and become an adult, called a red spotted newt, and go back to the water to live. Would you like changing shape during your life?



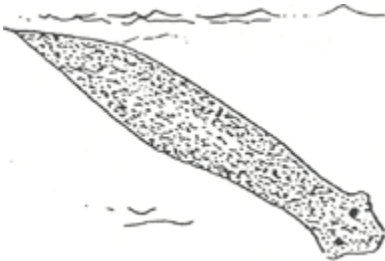
### SNAIL

Where are your eyes and mouth? They are on your head, but not so with me. My eyes and mouth are on my foot! I bet you think that's pretty odd, but it really makes a lot of sense. My mouth is on the bottom of my foot, because I eat algae, which grows where I crawl. On top of my foot are my eyes. They are on stalks, sort of like periscopes, and they help me watch for danger. When I spot a turtle, fish or bird, I pull my foot into my shell and hope I don't get eaten. Because I am a pond snail, I have a sack in my shell that's filled with air so I can breathe underwater. Snails in streams use gills to breathe.



### FLATWORM

Can you figure out why I am called a flatworm? It's pretty obvious when you look at me. Have you ever wondered what it would be like to have your mouth on your belly? That's where my mouth is. I crawl right onto my food, dead animals, and dine. Look carefully at my head. Those two little spots you see are my eyespots. I can't see with them like you see with your eyes. I use them to detect light, which I avoid. Most animals breathe with either gills or lungs. I, however, breathe through my skin. You can find me where the water is clean.



### BLACK-NOSE DACE

Have you ever noticed some very small fish swimming in a pond? You may have seen me, a black-nose dace. I breathe by taking in water through my mouth and using my gills to get oxygen out of the water. I like to eat algae, and bigger fish and some animals like to eat me so I have to be ready to swim away quickly when danger appears.



### SPIDER

"Yikes! A Spider!" I hear screams of terror like this all the time. I don't understand it, but it seems like most people are afraid of spiders. It makes no sense to spiders like me; after all, people are so much bigger than me. We spiders capture our prey by running it down, or trapping it in our web. Our bite is poisonous to our prey. It kills our victims before they can hurt us or get away. Some of us enjoy hunting on, or just below, the surface of the water. We carry a little bubble of air with us, so we can breathe underwater.



### WATER SCORPION

Don't let my name scare you. I really can't hurt you. Do you know why I am called a scorpion? (Hint: Look at my breathing tube.) I spend much of my time hanging upside down from the water's surface waiting for a meal to come by. Other aquatic insects that come close enough become my meals. I guess it would be like you hanging upside down from your ceiling at home and grabbing a bite when someone came by carrying food. You would have to be very patient! Just like you, I breathe air with lungs. I get air with my long breathing tube, which is a lot like a swimmer's snorkel. How do you think my shape hides me from my prey and predators?



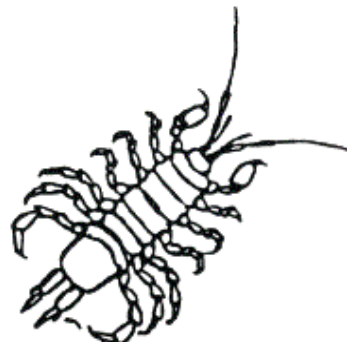
### DRAGONFLY NYMPH

Imagine yourself sitting still on the bottom of a pond, disguised as a stick and catching insects and tadpoles with your lower lip. That's how a dragonfly nymph, like me, lives. My lower lip, called a labium (lay-bee-um) can grab an animal smaller than me and bring it up to my mouth to eat. I can stay underwater because I breathe with gills, just like a fish. When I grow up, I will leave the water and have wings! Then I will hunt other flying insects, including mosquitoes.



### AQUATIC SOW BUG OR ISOPOD

Every wonder what it would be like to have lots of legs? Do decaying plants and animals sound tasty? Would you like to have gills and be able to breathe underwater? If you answered yes to all these questions, then you would probably be happier as aquatic sow bug. Aquatic sow bugs, like myself, play a very important role in keeping the pond clean. If it was not for us, decaying plants and animals would litter the pond bottom. Our eyes are very sensitive to bright light, so we avoid it by coming out only at night. The darkness of night also helps protect us from predators. We can live happily only where the water is clean and has plenty of oxygen.



### WATER STRIDER

Do you wish you could walk on water? I do it all the time! I have tiny water-resistant hairs on my legs that keep me from breaking through the surface of the water. Look closely, you may be able to see them. Do you think my name has anything to do with the way I live? Many insects fall into the water, or come to the surface to breathe. I am always on the look-out for these critters, so I can make a meal out of them.



### WATER MITE

Have you ever wondered what it would be like to have a body as round as a ball, and as small as a pinhead? You would look just like me, a water mite. Even with my eight legs, I am not a very good swimmer. I get around most of the time by crawling. I crawl on aquatic plants where I can hide from predators and search for animals smaller than myself to eat. Have you ever been told to chew your food 20 times before swallowing it? I don't chew my food at all, not even once. I just suck out my victim's body fluids with my jaws. I don't even have gills or lungs to breathe with. I just breathe through my skin.



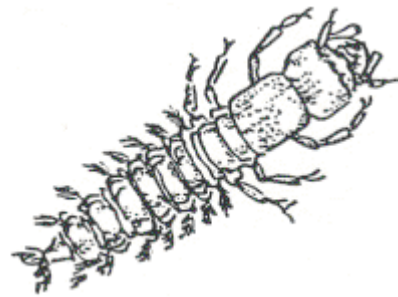
### SIDESWIMMER OR POND SCUD

If you watch me swim, I'm sure you'd notice I swim on my side. It's not as dumb as it looks. I can swim a lot faster on my side, and sometimes speed makes the difference between life and death. Lots of animals think sideswimmers, like me, taste really good. So I rely on my speed and ability to hide to keep me safe. I also wait until it's dark before I come out so I won't be seen. I help keep the pond clean by eating decaying plants and animals. I breathe with gills, just like a fish, so it's important that the water I live in is clean and full of oxygen.



### DOBSONFLY LARVA AND HELLGRAMMITE ALDERFLY LARVA

Since we are so similar in the way we look and live, we decided to talk about ourselves at the same time. Our big jaws may frighten you, but you really have nothing to fear. We can only bite animals smaller than ourselves. We spend the day hiding under rocks, looking for small critters to eat and avoiding hungry fish. Fish really think we're tasty, so people who fish like to use us for bait. We can only survive where the water is clean and full of oxygen. We live almost three years underwater, before we grow into adults. Then we have wings to fly.





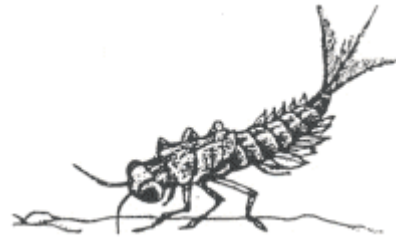
### STONEFLY NYMPH

Imagine yourself sprawled out, hiding under a rock at the bottom of a lake or stream, in constant fear of being eaten by a fish. That's how I spend my days. At night, I come out from under my rock and feed on aquatic plants. Just like a fish, I have gills, so I can breathe underwater. I am very sensitive to pollutants, so I can live only where the water is clean.



### MAYFLY NYMPH

Have you ever thought what it would be like to live without a nose? I have gills, which you will find on the sides of my abdomen. To survive, I need clean water that's full of oxygen. As a nymph, I eat aquatic plants. When I grow up and fly away from the pond, I will not eat anything at all and only live long enough to reproduce (about a week or two).



### MIDGE LARVA OR BLOODWORM

What would you think of spending your childhood underwater? That's how I spend mine, only I'm better able to live in water than you are. I have gills, and just like a fish, I get oxygen from water. My body looks like a worm's body, except I have a head and very tiny legs. I have to be really careful and spend most of my time hiding because many animals think I taste good. When I get hungry I eat algae and aquatic plants. When I grow up I will leave the water and be able to fly, just like my parents. My parents and I look like mosquitoes, but we do not bite like mosquitoes.



### CADDISFLY LARVA

Did you know that some insects wear clothes? My clothes don't look anything like yours, but I wear them for the same reason you do, to protect me from my surroundings. My body is very soft and my skin is tender, so I glue pieces of sand and plants together to help protect me from sharp rocks and animals that may want to eat me. Do you think you could make a glue that works underwater? I search the pond bottom for small animals and plants to eat. My gills get oxygen right out of the water, but they only work in clean water.





### DAMSELFLY NYMPH

If you did not have hands, how would you get food into your mouth? I do not have hands, so I use my lower lip, called a labium (lay-bee-um) to feed myself. I eat other aquatic insects and tadpoles. I do not have a cupboard or refrigerator to go to and grab a bite, so I must sit quietly on the pond bottom and wait for my food to come to me. How do you think my shape and color help hide me from my prey and enemies? Those three "tails" at the end of my body are really gills, and just like fish, I get oxygen from water.



### GIANT WATER BUG

Imagine yourself hiding among aquatic plants or on the bottom of a pond, waiting for another pond animal to come by within your reach. That's how giant water bugs, like me, live. When an animal like an insect or tadpole comes close, I grab it with my front legs, kill it with my poisonous bite and suck out its body fluids. I can even kill an animal larger than me. Take a close look at my shape and color. How do you think they help me from my prey and enemies? I do not have gills, so I must make trips to the surface to get air to breathe.



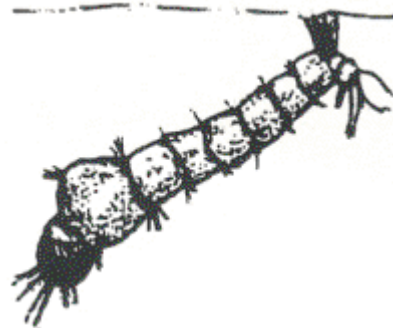
### CRANEFLY LARVA

Can you imagine living without eyes, ears, legs or arms? You sure would look different than you do now. You would look like me, a cranefly larva. Since I cannot see or hear, I don't always know if a hungry predator is coming my way. So I stay hidden in the muck at the bottom of the pond. I come out of hiding only at night when I cannot be seen to search for my food, aquatic plants. Although I do have gills and breathe underwater, I can also breathe air like you do. Have you ever seen "giant mosquitoes?" Actually, you saw my parents, craneflies. My parents are completely harmless and only eat plant nectar.



### MOSQUITO LARVA

I'm sure you are familiar with mosquitoes, but have you ever wondered what it would be like to be one? Mosquitoes, like myself, begin life by hatching from eggs laid in water. We spend our entire childhood underwater, feeding on tiny plants and animals, called plankton. We have lungs just like you, and get our air from above the water by using a breathing tube, which is just like a swimmer's snorkel. When I grow up, I will fly out of the water, and drink plant juices and the blood of animals. (Only females bite people. They need the blood to reproduce.) I'm not looking forward to growing up, though, because only a few animals (bats and birds) like me, and that's only because they think mosquitoes taste good!



### WATER SCAVENGER BEETLE

While swimming in a pond, have you ever thought about eating the algae or other aquatic plants that grow in the water? I love to eat those tasty plants, whether fresh or decayed. I bring a bubble of air with me when I dive, so I can stay down long enough to eat a full meal. It's a lot like a scuba diver bringing a tank on a dive. Did you notice the keel on my belly? It's just like a keel of a boat and helps me stay on course when I swim.



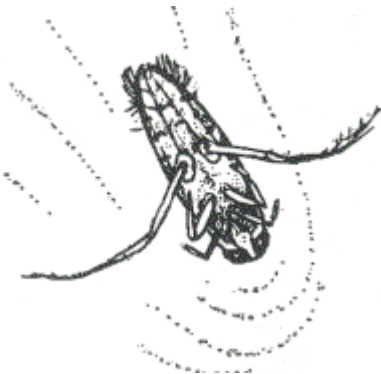
### CRAWLING WATER BEETLE

Ever considered crawling around underwater, looking for plants to eat, while breathing from a bubble of air held against your belly? You must have thought about what it's like to live like me, a crawling water beetle. Being so tiny has a big advantage: animals who think I taste good have a hard time finding me. I do not have gills like a fish, so I bring a bubble of air with me when I dive. If I get bored with the pond where I live, I just fly to another one.



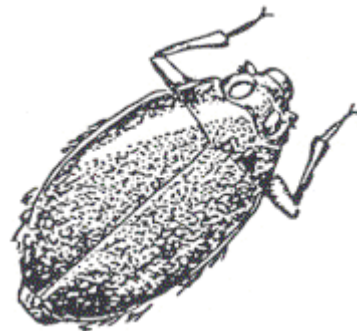
### BACKSWIMMER

After watching me swim, I think you'll agree that my name, backswimmer, fits me just right. I spend most of my time at the surface of the water waiting for a meal to come by. I am a meat eater, and will eat any aquatic animals smaller than myself. When a victim comes close, I dive after it, taking a bubble of air with me. I bring air with me, because like you, I breathe with lungs, not gills. When I catch my prey, I bite it and suck out its body fluids.



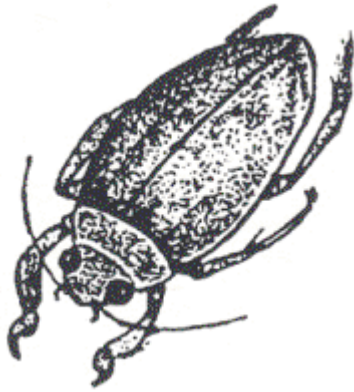
### WHIRLIGIG BEETLE

Ever wish you had an extra pair of eyes on the back of your head? You would have four eyes, and be very hard to sneak up on, if you were like me. Have you ever spent a whole day running around in circles in your backyard? I spend my whole adult life swimming in circles, on the lookout for danger from both above and below – and for a meal, especially insects that fall into the water. I do not miss what goes on in my neighborhood. I do not know why? (I have so many eyes.) I carry a bubble of air when I dive because I have lungs just like you. Try to catch me, I move pretty fast!



### **PREDACEOUS DIVING BEETLE**

Every wonder what it would be like to go scuba diving, capturing animals like insects, tadpoles and small fish in your jaws, and sucking out their body juices? I do it all the time! I do not have gills. Like a scuba diver, I bring air with me when I dive. Since I do not have air tanks, I carry a bubble of air under my wings. If the hunting is poor in the pond where I live, I just fly to a different pond. When I was younger, I looked very different and was called a larva. In those days, I had a breathing tube and used it like a swimmer uses a snorkel.



### **WATER BOATMAN**

Imagine yourself scuba diving in search of decaying plants and animals. That's how a water boatman, like me, lives. I do not have gills, so I take a bubble of air with me when I dive. I spend most of my time on the bottom eating algae or decaying plants and animals, and hiding from predators, like fish.

