



## POND LIFE

### Introduction

Think about all the living things there are in the world and where you can find them...

They're everywhere! On land, in the air, in water and even underground. If you look hard enough, you can find them in the soil, under logs and stones, in grass and in trees.

The place where you find living things is called a **habitat**. A habitat is like a home – it could be a forest, a field or a pond. Imagine your home...there are cupboards, tables, light, heat, other people and sometimes pets. These all make up an **environment**.

Look at this habitat. Here, there are plants, creatures, water, light and sometimes rain. These all make up a pond environment. Why do all these living things live here? What makes them suited to a pond environment?

### Visiting A Pond

Spring is the season when the pond comes to life. One of the first things to look out for are the masses of frog and toad spawn. After a few weeks, tadpoles have hatched from the spawn and water plants have started to grow.

By summer the tadpoles have turned into froglets and the pond is full of animal and plant life. This is the best time to visit the pond...

*<<Video of woman asking questions, "What is pond dipping? What do you expect to find in the pond?" Answers from kids. Fade audio out for next piece of voice-over.>>*

Now we're ready to go down to the pond. Before we begin, we need to know how to pond dip.

*<< Video of woman demonstrating how to kneel, putting water into container, placing net in water to catch organisms, lifting net out and emptying net. This will then be put into practice by the kids, various shots with their comments.*

*For the rest of the procedure, there will be VO as the children carry out what is being said. >>*

At first glance, it may look as if you haven't caught anything – but look again!

Animals in the pond are very good at hiding and blending into their surroundings. This is how they survive and hide from other animals.

<< Video: "Let's go look at what we've found!" >>

## What Is It?

*(Identifying species...Nell Bank Pond Key)*

What do you think this creature is? And this one? We can work it out by asking a series of questions called a key...

<< Diagram of key. >>

Firstly, does the creature have legs?

- Yes – how many?
- 2-4 – the animal must be a frog, a toad or a newt tadpole.
- 6 legs – it is an insect. Has it got a tail?
- Yes – then the insect must be a mayfly nymph or a damselfly nymph.
- No tail – the creature must be a caddis fly larva, a water boatman or a pond skater.

This animal does have legs and it has 2-4, so it must be a newt tadpole.

This animal has no legs, but it has got a shell. This must be a snail.

This animal has no legs and it has no shell – it is a tadpole.

This creature has legs – it has 6 legs so it is an insect, but it doesn't have a tail. This must be a caddis fly larva.

Now we're ready to put the animals back. Place the container carefully into the water, then gently tip it on its side for all the animals to float back into the pond. Check your container to make sure its clean and empty.

<< Woman explains how to remove any remaining animals from the container. "That's how you pond dip". >>

All these creatures live together in a pond **ecosystem**. They all eat different things found within the pond, but most importantly, they all need each other to survive. That's because every living thing in the pond is part of a **food chain**.

## Food Chains

Nearly all food chains begin with a green plant, whether it's the trees in a forest, the grass in a field or the weeds in a pond.

All living things must feed in order to grow, but plants don't eat food in the same way that we do – they make their own food! Living things that make their own food are called **producers** and when plants do this, we call it **photosynthesis**. Plants have a green colouring called **chlorophyll** which uses energy from sunlight to turn water and **carbon dioxide** into food. Carbon dioxide is a natural gas that we can't see or smell.

Plants are very important because as they take in carbon dioxide from their environment, they give off another invisible gas called oxygen. Oxygen is essential for all living things. Humans breathe oxygen in the air and pond creatures take in oxygen from the water.

Although we can't see them, there are tiny, microscopic organisms like algae, bacteria and fungi living in the pond. These are called **micro-organisms**. Apart from providing food for larger pond creatures, these are very useful for breaking down waste, but not all micro-organisms are helpful. Some come in the form of viruses and are very harmful to life in the pond.

Like plants, micro-organisms, dead plants and animals can also be found at the start of the food chain.

These are eaten by the tiny slow-moving plant eaters – like this Great Pond Snail. Any creature that eats a producer is called a **primary consumer**, because they are the first to eat, or consume something else in the food chain.

Some of the creatures in the pond eat plants *and* other creatures, these can also be primary consumers. The Mayfly Nymph is one of these.

And the primary consumers are eaten by the larger, fast-moving meat-eaters that tend to have bigger eyes and more powerful mouth parts – like this newt. These are called **secondary consumers**.

Even the larger animals in the pond are threatened by fish, birds and sometimes snakes. Any living thing that is hunted or killed by another for food is called prey. Living things that hunt or kill are called predators. Every animal needs to hide and protect itself from predators.

The caddis fly larva is a primary consumer and feeds off plants, but it is eaten by fish and other larger pond creatures. Look how the caddis fly larva protects itself by covering its body with little pieces of wood? This also helps the creature to blend with its surroundings.

Can you see how a food chain is building up?

<< *Diagram – sun, pond weed, mayfly nymph, newt.* >>

This food chain shows how energy is passed from one living thing to another, energy is **transferred**. The energy from the sun is transferred into the pond weed. The energy from the pond weed is transferred into the mayfly nymph which is then transferred into the newt.

This is another food chain involving a newt.

<< *Diagram – sun, water hawthorn, phantom midge larva, newt.* >>

Instead of showing the newt twice, we can join the two food chains together to make a **food web**.

Imagine what would happen if we took away all the secondary consumers from the pond. What do you think would happen to the rest of the animals and plants in the pond? There would be nothing left to eat the primary consumers, so their number would grow and grow. BUT, they would need to eat more plants to survive and eventually all the plants would be eaten and the primary consumers would die. That is why every living thing in the pond has a very important role to play.

So, the type of food pond creatures need to survive is one reason why they live where they do. What other reasons make living things suited to a pond environment?

## **Why Are Living Things Suited to Their Environments?**

There are lots of things that make up a water environment...

### **Light**

Light can't travel very deeply into water. That is why plants that need light in the pond, like pond weed, live near the surface. Other plants which grow deeper have long stems or floating leaves. Light also helps creatures in the pond to hunt for food.

### **Temperature**

Water temperature doesn't change very much compared with the temperature on land. Although, certain animals do need warm water and others prefer cold. A tropical fish in cold water would soon die. A pond creature in tropical aquarium would not be able to survive.

### **Waterflow**

In a river, waterflow is very fast and creatures need to be able to hold on without getting swept away. Creatures that can't do this need to live in a pond where the water is still.

### **Depth**

The deeper the water, the more pressure there is acting on creatures. That is why delicate, tiny pond creatures can only survive in ponds which are quite shallow.

### **Muddiness**

Some animals can only survive in clean, clear water. Pond creatures use the muddiness to hide from predators.

### **Oxygen**

There is more oxygen in a swiftly flowing stream. Only few creatures can survive in still pond water.

### **Rainfall**

Usually in Britain, it can rain any time of the year, so creatures in the pond don't have to worry too much about not having enough water. But sometimes we have droughts and ponds dry up.

Why are certain creatures suited to a pond environment?

**The Whirlig Beetle** has special eyes that let it see in the air and under water at the same time. If it spots danger above water, it can dive under water taking a supply of air with it.

**The Water Boatman** has long, hairy legs for swimming that help it to catch other animals in the pond for food. It collects a bubble of air to help it stay under water longer and can fly from pond to pond in the night.

**The Great Pond Snail** has suckers to hold onto plants. It has a tough mouth for chewing plants and a shell for protection against predators.

**The Phantom Midge Larva** breathes air on the surface of the water from a tube, so it can live in quite polluted water. It is a fast swimmer and is see-through or **transparent** so it can avoid predators.

**The Common Frog** can live in and out of water – it is an **amphibian**. It has a long, sticky tongue for catching insects in and around the pond. It has webbed feet for swimming, long legs for jumping and lungs for breathing air. Tadpoles have gills to take in oxygen. The Common Frog has tough skin for crawling under logs and stones, which it does in winter to sleep when food is scarce. This is called **hibernation**.

**The Common Toad** is very similar to the Common Frog, except that it has an air sac above its lungs to help hold its breath under water and it has horrible tasting, poisonous skin.

**The Dragon Fly** lives around the pond using its large eyes to help it see animals approaching. It catches animals that come near it, with its quick jaw action. It lays eggs in ponds or at the stem of pond plants, which hatch into nymphs.

**The Mayfly Nymph** has six strong legs for holding onto water plants. It is brownish grey for blending in with water plants. It breathes oxygen from the water through gills at the side of its body, but it needs a lot of oxygen, so it can only live in clean, unpolluted ponds.

Have you ever wondered what happens to all these creatures in winter? Where do they go?

### **The Complete Cycle**

When autumn arrives and frogs, toads and newts hunt for food to build their bodies up. This is to keep them alive through the winter when they will bury themselves under cover and hibernate.

By winter, most of the plants in the pond have died and the small pond creatures wait patiently in the bottom of the pond for spring to begin the cycle all over again.