


# Lesson 9 - Water for wildlife

- In the garden and the environment



## Before you start this session, please:

- Print Session Information sheets
- Print Activity sheets 9:1, 9:2 and 9:3
- Make sure you have access to the internet so that you can watch video clips on YouTube.
- Or print Supporting Information sheets 9:1 and 9:2
- Collect together the following items to help you complete the experiment and activities in this lesson.
  - Food colouring, small pots, white flower and water
  - Colouring pencils or pens

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## Let's get started

In an earlier session you found out how we 'borrow' the water from the environment. We take water from rivers and aquifers (underground lakes), clean it, use it, clean it all over again and then return the recycled water back to the rivers and sea. So, we have an important role to play in looking after our environment by maintaining water quality.

So, water is just for humans... right? Wrong... we know that water is vital for us, but have you thought about plants, birds, animals, insects? All living things need water to survive and flourish.

We have many important wildlife habitats in our region, for example at Rutland Water, one of our Reservoirs, which we need to protect. We work closely with The Wildlife Trusts, RSPB, the Environment Agency and Natural England to protect the variety of life.

## Biodiversity - what does that mean?

Well, it includes everything that is alive on our planet - all species of animals and plants upon which human survival depends. Have a look at some of the work done by our Biodiversity Team to maintain a flourishing environment.

Watch the video [The Natural Wetland that recycles water](#) on the Education Playlist. Don't worry if you cannot watch it.

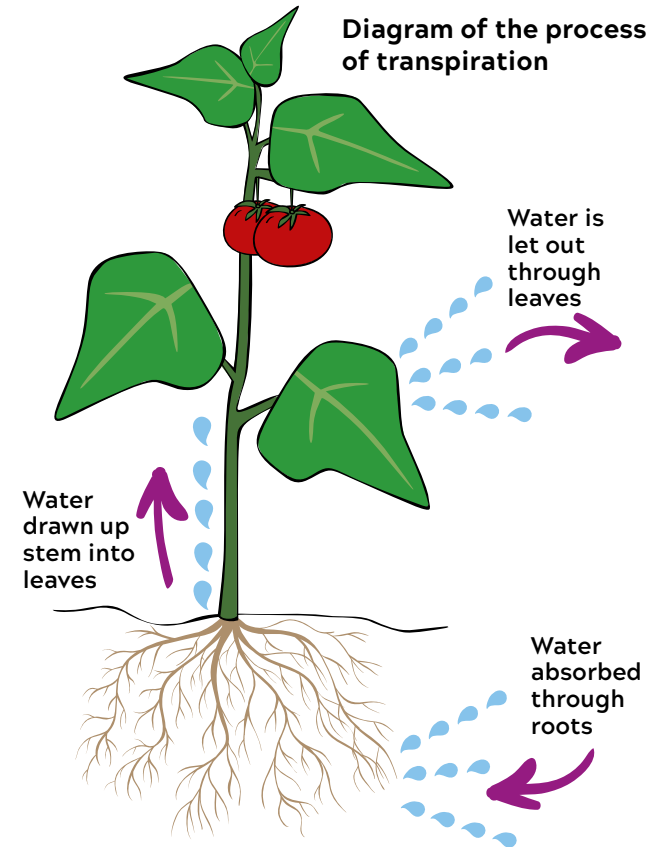
## Let's begin with plants

Plants need water to grow and seeds need water to germinate.

If seeds and plants have too much water, they will rot in the soil; if they have too little they will not spring into life and grow. Roots take up food (nutrients) from the soil and it is water that helps this happen. If the soil around the roots is dry, then the plant will not be able to feed.

## Transpiration

'Transpiration' is the name of the process where the plant lets out water through the leaves. Minute holes allow this to happen. This process also helps the roots to draw up water from the soil.



## Let's investigate:

### Investigation 1:

Try this investigation to see how a plant takes up water from its root in Activity Sheet 9.1.

Plants are, like us, mostly made up of water; they also take in and lose water in different ways at different times.

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## Let's recap on what we know

- All living things need water
- Anglian Water is linked to the environment and we play our part in protecting and enhancing wildlife across the East of England;
- We support environmental protection and the benefits it brings.

Now, it is time to take a closer look.

### Let start with ponds

Pond dipping is a fun activity, but it's an ideal way for us to measure the biodiversity of our reservoirs and rivers. It helps us find out how clean they are.

## Let's investigate:



### Investigation 2: Virtual pond dipping?

Look at the video [Pond Dipping](#) on the Education Playlist. Complete Activity sheet 9:2 as you watch the video. Don't worry if you cannot see the video, use Supporting Information sheet 9:1 to help you complete the activity sheet.

If you have a pond nearby, take a look at Supporting Information sheet 9:2 to get some top tips for pond dipping.

Did you notice the Dragonfly Nymph scored 10 on the pond dipping sheet? That's because a dragonfly lays its eggs in water that must be clean and well-oxygenated. Their presence is a good sign that the water in the pond is healthy. Find out more about dragonflies using Activity sheet 9:3.



Image: Ian Jones

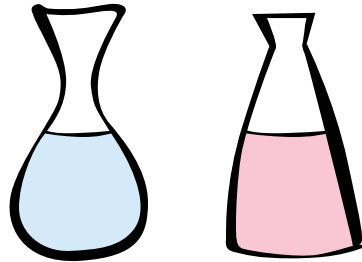
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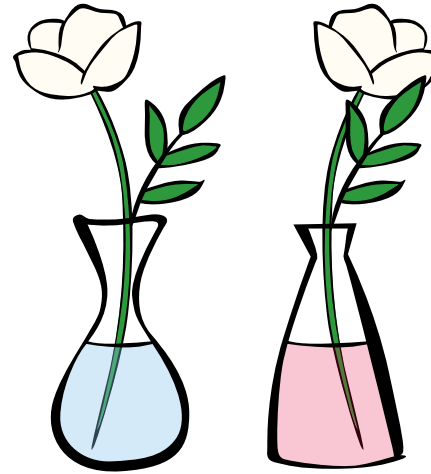
## From root to leaf

### You will need:

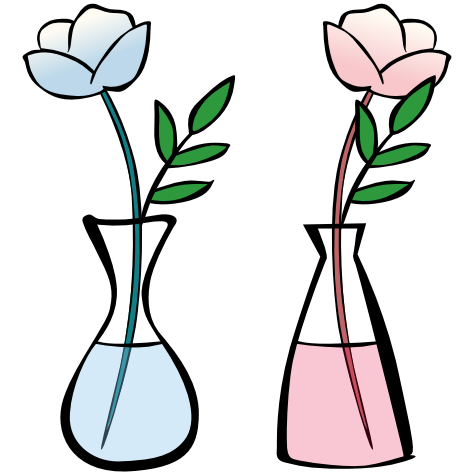
- Food colouring
- tall narrow pots
- a white flower
- water



1. Fill a tall narrow pot with some water and add some food colouring (blue or red works best).



2. Place a white flower in the pot (a pale flower will work too).



3. Observe over the next few days to see how the stem and flower change.

Now you have seen transpiration in action. When the plants are in soil, the water will travel up from the plants' roots through the stem to the flower, if it is a cut flower (like yours) it travels up the stem into the flower.






















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## Pond dipping - Identification and the score




You can use the Pond Dipping video, your own pond or Supporting Information sheet 9:1 to help you complete the sheet. (If you are using your own pond, take a look at Supporting Information Sheet 9:2).

Mark the creatures you see and add up the score.

Have you spotted any creatures worth 1?		Any worth 5?			Or 10?	
 Pond Snail <input type="checkbox"/>	 Ramshorn Snail <input type="checkbox"/>	 Greater Water Boatman <input type="checkbox"/>	 Pond Skater <input type="checkbox"/>	 Freshwater Shrimp <input type="checkbox"/>	 Damselfly Nymph <input type="checkbox"/>	 Dragonfly Nymph <input type="checkbox"/>
 Pea Mussel <input type="checkbox"/>	 Bloodworm <input type="checkbox"/>	 Lesser Water Boatman <input type="checkbox"/>	 Water Scorpion <input type="checkbox"/>	 Water Stick Insect <input type="checkbox"/>	 Caseless Caddisfly Larvae <input type="checkbox"/>	 Cased Caddisfly Larvae <input type="checkbox"/>
 Flatworm <input type="checkbox"/>	 Midge Larvae <input type="checkbox"/>	 Diving Beetle Larvae <input type="checkbox"/>	 Diving Beetle <input type="checkbox"/>	 Mayfly Nymph <input type="checkbox"/>		
 Leech <input type="checkbox"/>	 Water Hoglouse <input type="checkbox"/>					

**Is the pond healthy?**

Add up the score of your animals, and remember to only count each type of creature once. For example:

			= 16
Greater Water Boatman 5	Pond Snail 1	Dragonfly Nymph 10	

Quality	Scores
Low quality	Between 0-17
Moderate quality	Between 18-34
Good Quality	Between 35-51

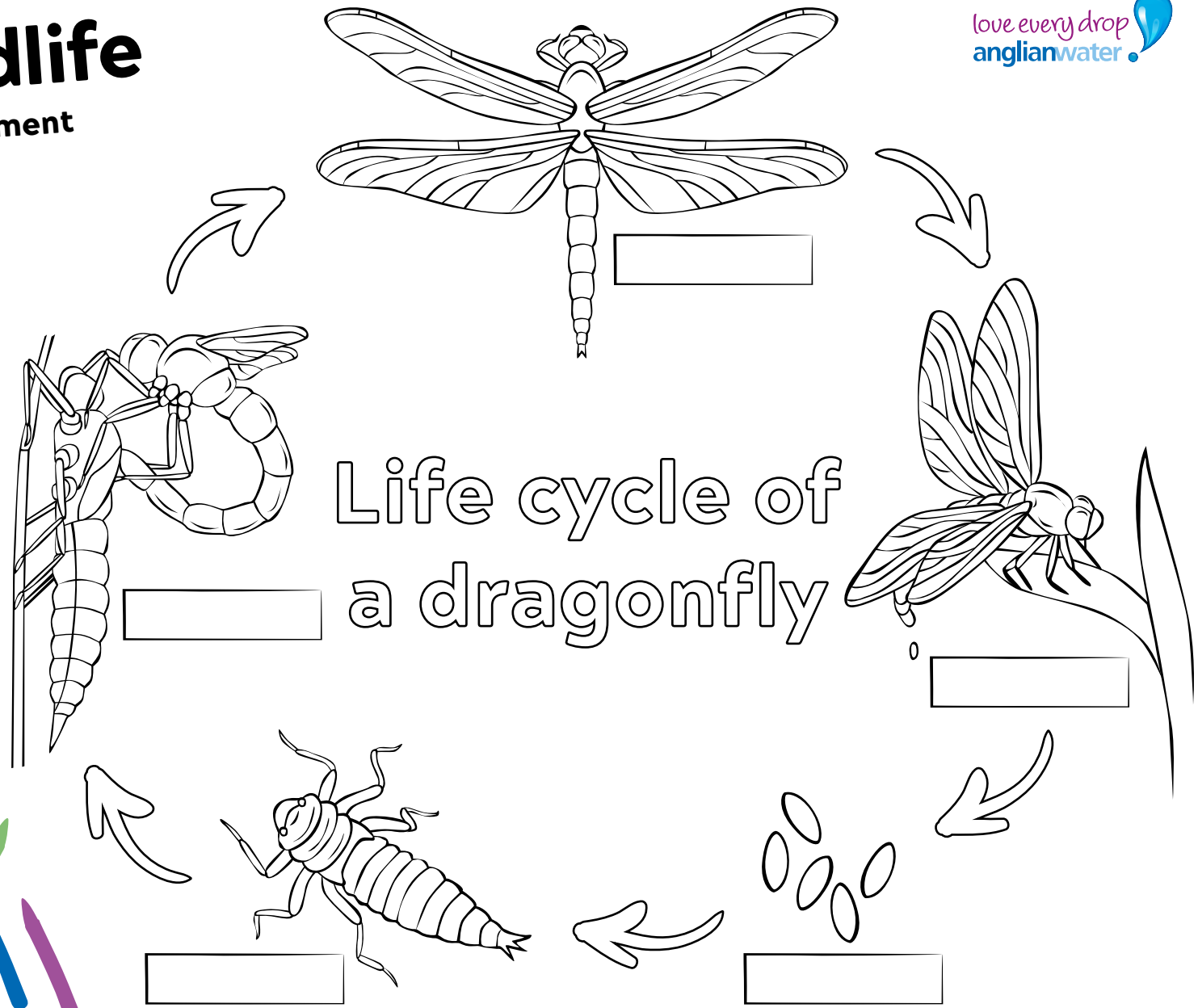
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## Life cycle of a dragonfly

1. **Laying the eggs:** The female dragonfly dips half her body into water to lay her eggs.
2. **The eggs** take about two weeks to hatch into nymphs.
3. **Nymphs or larva** can live in the bottom of the pond for up to 4 years.
4. When they are ready to turn into a dragonfly, the nymphs crawl out of the water, **moult** (breaking out of their 'old' body - exoskeleton) and let their wings harden.
5. Then they fly away as an **adult** to start the whole process again.

## Life cycle of a dragonfly



Put the correct words next to the matching image.

The eggs

The adult

Moult

Laying the eggs

Nymphs or larva

Colour in your dragonfly life cycle. Remember to make your dragonfly colourful.



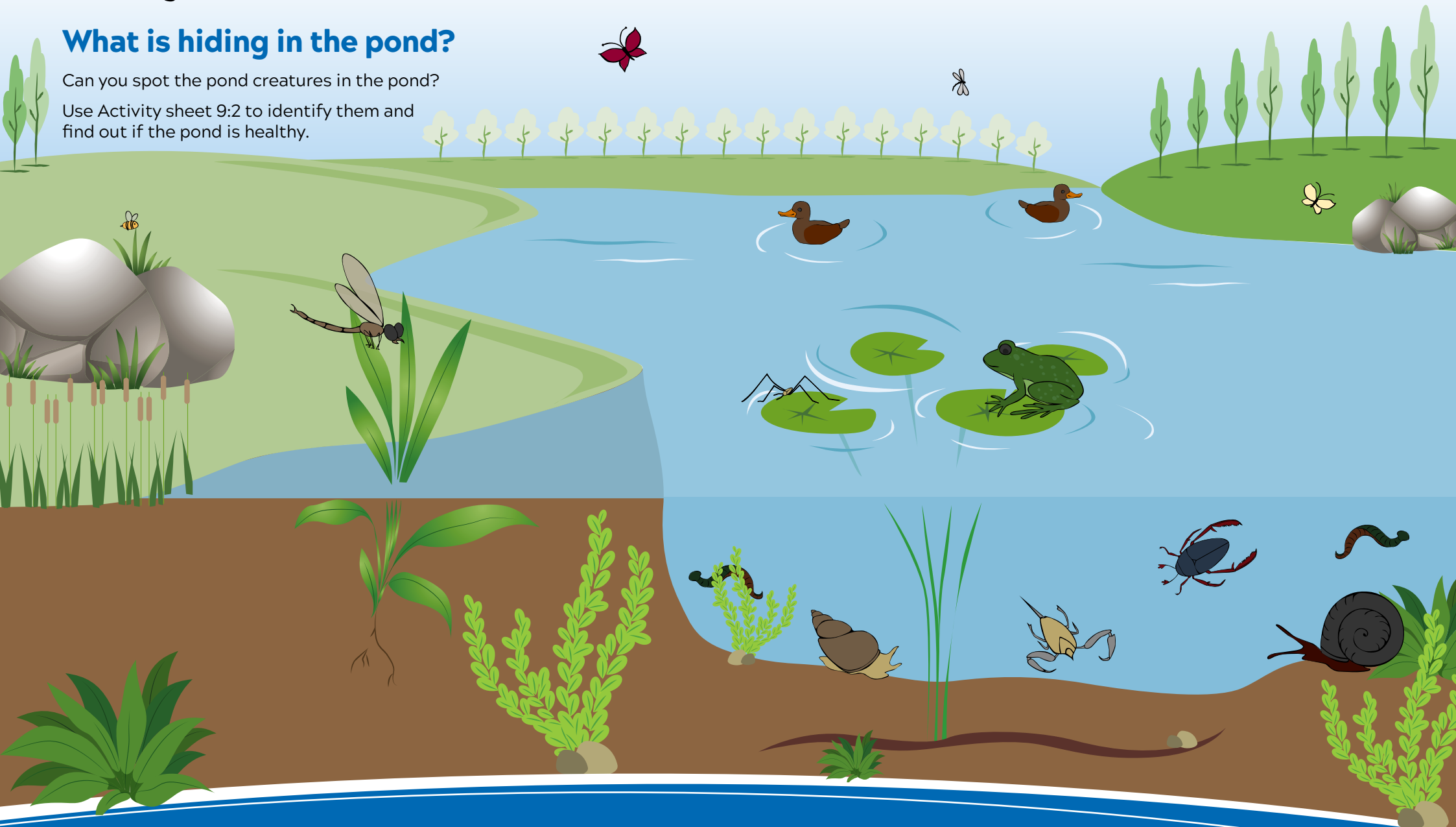
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## What is hiding in the pond?

Can you spot the pond creatures in the pond?

Use Activity sheet 9:2 to identify them and find out if the pond is healthy.



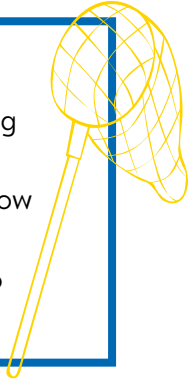
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## Have a go yourself! - Top tips for pond dipping

### You will need:

- A pond dipping net
- A tray or shallow container
- A grown-up to keep you safe



### Getting started:

- Look for animals skating about on the surface of your pond. You might not catch these in your net so mark them on Supporting Information sheet 9:1.
- Get your grown-up to help you add some pond water to your tray or container so it is ready for the animals you catch.
- Sweep your net in and around the plants or other habitats for about 15-20 seconds using a figure of eight motion. Be careful not to damage the plants or disturb the bottom of the pond too much.
- After each sweep, empty the contents into your tray or container.
- Remove any large pieces of plant - checking there are no animals on them.
- Leave the tray to settle for a minute or two.
- Mark any creatures you see on the Supporting Information sheet.
- Then calculate the score of your pond to see how healthy it is.

### What creatures have you seen?

