

Water Quality at Sparsholt

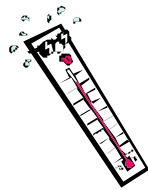
Helpsheet: How to measure.

1. Oxygen (dissolved)



- Place the end of the probe in the water sample to adjust to water temperature. Move it slowly from side to side to simulate flowing water.
- Press "**GO**" twice to get % and record your result as % **oxygen**.

2. Temperature



- Still using the oxygen probe press "**GO**" once more (A third time) to get a temperature reading.
- Record temperature
- Press "**GO**" once more (a fourth time) to **turn off** the meter.

3. How dirty is the water?



- Fill the plastic bottle to the line (1 litre) and leave to stand for **10 minutes**.
- Look down through the top of the bottle to the plastic disc (with dots) at the bottom.
- How many of the 12 dots can you see?
- Record the clarity (1 – 5) that you can see on your sheet

4. How acid/ alkaline is the water?



- Place a sample of water in the small plastic pot.
- Hold the pH test strip by the white end only.
- Put the test strip into the water and leave it for up to **10 minutes** or until the colour has stopped changing.
- Remove test strip and read off the value from the colour chart. Record your result.
- Place the finished test strip in the bag for disposal at the centre.

5. Water Pollution (nitrates)



- Place a sample of water in the small plastic pot.
- Take the test strip labelled "nitrates". Hold the white end only.
- Dip the test strip into the water for **1 second**. Remove & shake dry.
- Wait for **1 minute** then read off the value from the colour chart. Is the water polluted by nitrates? Record your result.
- Place the finished test strip in the bag for disposal at the centre.

Water Quality at Sparsholt

Helpsheet: What your results tell you.

1. Temperature

This will vary with season. Ground and air temperatures will affect the water temperature, but water heats up and cools down slowly (as water has a high specific heat capacity). This means you do not get large daily changes in temperature.

High temperatures affect the water chemistry. As water temperature increases, less oxygen can be held in solution (dissolved). Changes in oxygen levels will have serious effects on the animals in the water. Too little oxygen and some species will die.

2. Water clarity (dirty or clean?)

How clear is the water?

1 = very clean 2= clean 3 = dirty 4= very dirty).

If the water has a lot of sediment it will be difficult for light to reach the plants below the water. The submerged plants will then find it difficult to grow. Submerged plants release oxygen into the water. Less plants means less oxygen in the water itself and less food and habitat.

Animals with gills eg. fish are particularly sensitive to suspended sediment as this can affect the function of the gills causing them to 'clog' with debris. The animals will then be unable to take in oxygen and they will die.

3. Oxygen (dissolved) in water

Oxygen can enter the water by diffusion at the water surface or from underwater plants (photosynthesis). The speed and depth of water will also affect oxygen levels (faster flow = higher oxygen, deeper water = lower oxygen). Oxygen is vital for life. However, some animals are more tolerant to low levels than others *eg. fish & mayfly nymphs (animals with gills) are sensitive changes in oxygen while midge larvae are tolerant of low levels.*

Dissolved oxygen levels:

<i>Optimum</i>	<i>Good</i>	<i>OK</i>	<i>Poor</i>	<i>Low</i>
<i>> 80%</i>	<i>60 – 80%</i>	<i>40 – 60%</i>	<i>10 – 40%</i>	<i><10%</i>

Note: Temperature will affect how much oxygen the water can hold. Cooler water holds more oxygen than warmer water.

Water Quality at Sparsholt

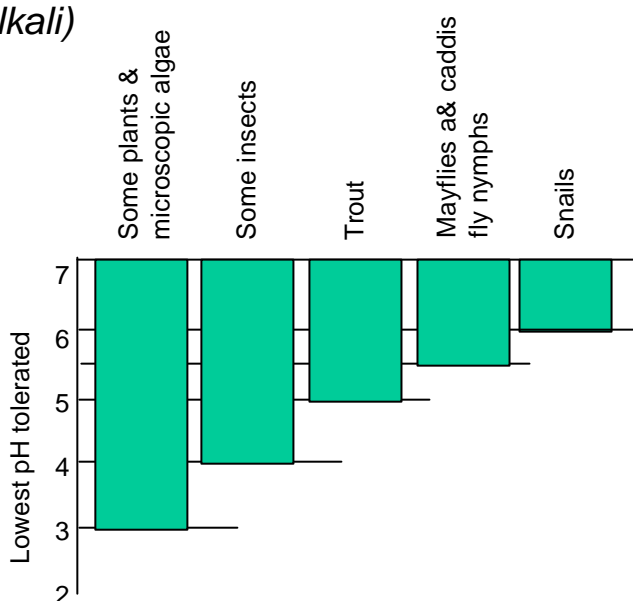
Helpsheet: What your results tell you.

4. How acid is the water (acid, alkali or neutral)

The water in a pond, stream or river usually comes from rainwater entering the system directly or by surface and/or ground run-off. The surrounding geology (soil) and air quality (acid rain), therefore, influence the water pH.

The pH of the water effects what plants and animals can live there. Most animals have a narrow 'range' that they can survive in. This is called their tolerance. Some examples are given below. (*remember: pH 6 or less = acidic, pH7 = neutral and 8 or more is alkali*)

Tolerance of animals and plants to low pH (acid)



5. Nitrates in water

There is often a lot of concern about nitrates in water, but it is important to remember that nitrates are essential for plant growth.

0 mg/litre nitrate	No nitrate available for plants to use
10 mg/litre nitrate	Low level of nitrate in the water
50 mg/litre nitrate	The maximum amount recommended for drinking water
500 mg/litre nitrate	Extremely high levels of nitrate in the water

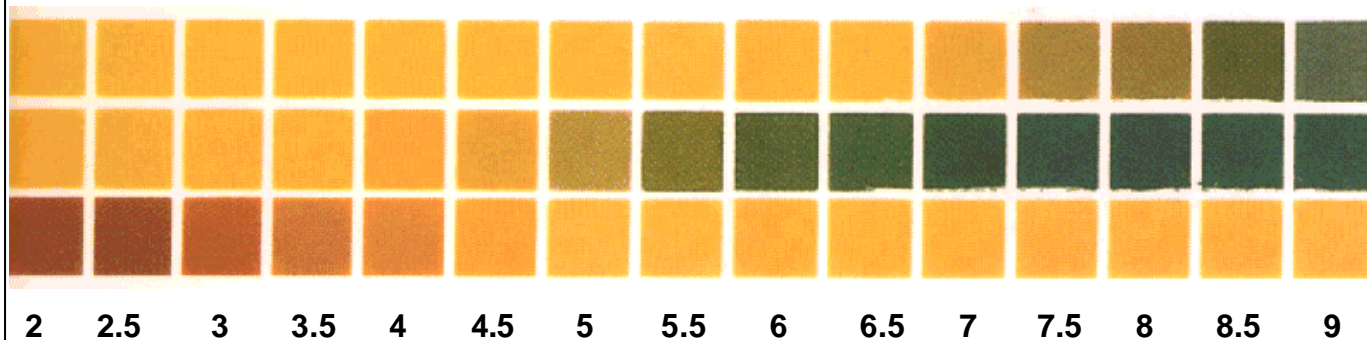
Agricultural areas (eg manure from grazing animals and fertilisers) are often linked to increased nitrate levels in ground waters.

Water Quality at Ower Pond

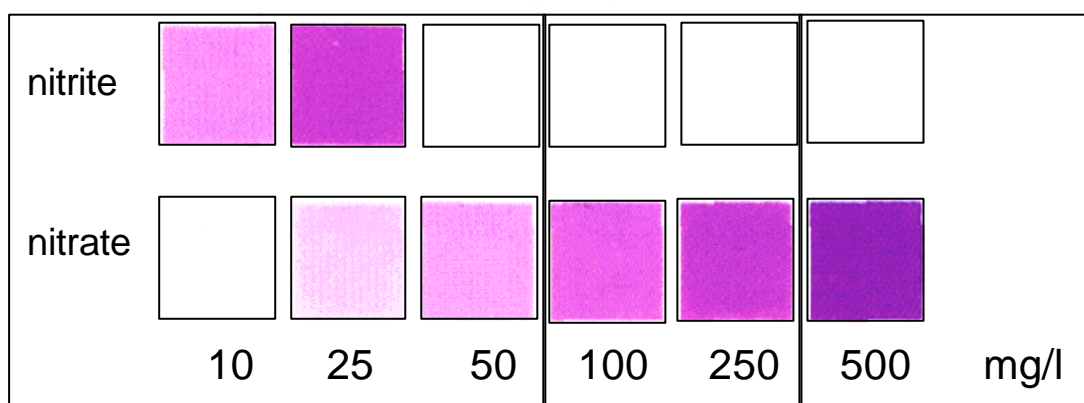
Physical Factors

What is dissolved in the water?

What is the pH of the water? (how acid or alkaline is it?)


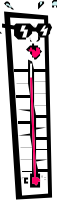






Is the water polluted with nitrates ?




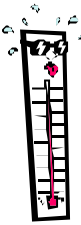

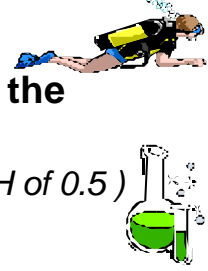

Water Quality Results



	Fish Hatchery Results					Pond water
	Site 1. Bore hole inflow	Site 2. Fish tank	Site 3. Sediment trap	Site 4. Reed bed	Site 5. Lake	
1. Water Temperature  <i>(using a digital probe accurate to 0.5°C)</i>						
2. Water clarity (scale 1 – 5)  1 clean (see 12 spots) 2 (see 9 spots) 3 (see 6 spots) 4 dirty (see 3 spots) 5 very dirty (see no spots) <i>(visual test using a large bottle with transparency disc)</i>						
3 What is dissolved in the water?  a) Oxygen in the water <i>(use the special probe)</i>						
b) How acid is the water?  <i>(use the indicator test strip accurate to a pH of 0.5)</i> acid neutral alkali						
c) Is the water polluted with nitrates?  <i>(use the coloured test strip)</i> mg/l						


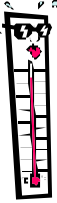




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3 What is dissolved in the water? a) Oxygen in the water <i>(digital probe % dissolved)</i>					
b) How acid is the water? <i>(test strip to pH of 0.5)</i> 					
c) Is the water polluted with nitrates? <i>(test strip mg/l of NO₃)</i>					
d) Is the water polluted with ammonia? <i>(Lab test for NH₃)</i> 					

Water Quality Results



	Fish Hatchery Results					Pond water
	Site 1. Bore hole inflow	Site 2. Fish tank	Site 3. Sediment trap	Site 4. Reed bed	Site 5. Lake	
1. Water Temperature  <i>(using a digital probe accurate to 0.5°C)</i>	11.1	11.6	11.6	15.0	15.8	16.0
2. Water clarity (scale 1 – 5)  1 clean (see 12 spots) 2 (see 9 spots) 3 (see 6 spots) 4 dirty (see 3 spots) 5 very dirty (see no spots) <i>(visual test using a large bottle with transparency disc)</i>	1	1	1	2	1	3
3 What is dissolved in the water? 						
a) Oxygen in the water <i>(use the special probe)</i>	95%	90%	71%	75%	81%	65%
b) How acid is the water?  <i>(use the indicator test strip accurate to a pH of 0.5)</i> acid neutral alkali	7.5	7.5	7.5	7.0	7.5	7.0
c) Is the water polluted with nitrates?  <i>(use the coloured test strip)</i> mg/l	50 mg/l	50 mg/l	50 mg/l	25 mg/l	50 mg/l	<10 mg/l

Results averaged from data collected during May 2003