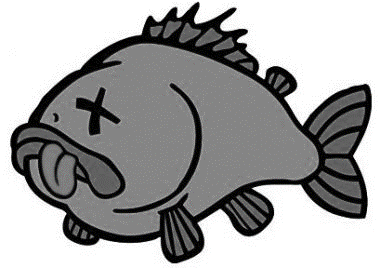
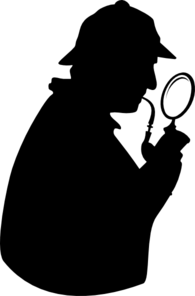
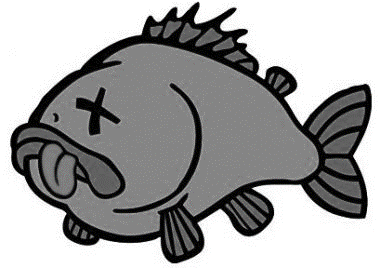
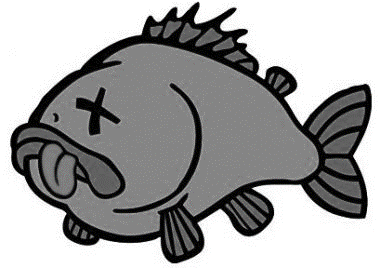
**Case of the Dead Fish**

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One chilly morning, Mr. Waters awoke to find that his beautiful pond was now filled with dead fish. Everything had seemed fine the day before, and the water looked crisp and clear, but now it was ruined! Distraught, Mr. Waters calls the local school’s science teacher for help. He asks the teacher if they can help him to find out why all his fish died and what he can do to stop it from happening again. The teacher, seeing this as a great educational opportunity, agrees to help. The teacher rallies the students, preparing them to be a detective to solve the Case of the Dead Fish. To help the students solve this tragedy, the teacher asks Mr. Waters if he has any previous water quality data. In the past, Mr. Waters allowed science classes and summer camps to use his pond for water quality testing, and still has data from the previous tests. The teacher sends out some of the students to collect new data as well. The data from the previous tests and the newest test are provided below, along with some vocabulary the teacher thinks will be useful:

**Vocabulary**

* **Fish kills:**used to describe the sudden large die off of a large number of fish.
* **Conductivity:**a measurement of how able the water is to conduct electricity
* **Dissolved oxygen:**a measurement of the amount of oxygen in a water sample
* **Total dissolved solids:**a measurement of the number of particles in the water sample
* **Turbidity:**the amount of dirt, debris, or other particles within the water column
* **Stratification:**the process of layers separating, in this case temperature layers
* **Epilimnion:**the upper layer of a body of water, warmer with high primary productivity
* **Thermocline:**the middle layer of the body of water, where the temperature begins to cool
* **Hypolimnion layer:**the bottom layer, typically is the coldest and has the least amount of oxygen
* **Respiration:**the process where oxygen and sugar are used as fuel and the product is carbon dioxide, water, and energy

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| --- | --- | --- | --- | --- |
| **Date** | **Site ID/Name** | **Location** | | |
| 05/15 | Mr. Water’s Pond | Mr. Water’s Farm | | |
| **Site Description** | | | | |
| A small pond with some cattails and other plants. The water looks clear and has some fish in it and bugs on the surface. | | | | |
| **Weather Conditions** | | | | |
| There was some rain two days ago, but today is dry. It is sunny and 17ºC. | | | | |
| **pH** | **Conductivity (μS/cm)** | **Total Dissolved Solids mg/L** | **Dissolved Oxygen mg/L** | |
| 6.7 | 400 | 550 | | 6.2 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** | **Site ID/Name** | **Location** | | |
| 07/20 | Mr. Water’s Pond | Mr. Water’s Farm | | |
| **Site Description** | | | | |
| A small pond with a lot of plants including cattails and other grasses. The water looks clear with some plants on the surface and it has some fish in it and bugs on the surface. | | | | |
| **Weather Conditions** | | | | |
| There hasn’t been any rain recently. It is partly cloudy and 26.6ºC. | | | | |
| **pH** | **Conductivity (μS/cm)** | **Total Dissolved Solids mg/L** | **Dissolved Oxygen mg/L** | |
| 7.2 | 450 | 500 | | 6.8 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** | **Site ID/Name** | **Location** | | |
| 08/10 | Mr. Water’s Pond | Mr. Water’s Farm | | |
| **Site Description** | | | | |
| The pond looks a little higher than normal. Some plants are partially submerged because of the morning rain. There are a lot of bugs on the surface and some fish. | | | | |
| **Weather Conditions** | | | | |
| It rained this morning. It is sunny and 28ºC. | | | | |
| **pH** | **Conductivity (μS/cm)** | **Total Dissolved Solids mg/L** | **Dissolved Oxygen mg/L** | |
| 6.5 | 500 | 600 | | 7.8 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** | **Site ID/Name** | **Location** | | |
| 11/18 (**TODAY!)** | Mr. Water’s Pond | Mr. Water’s Farm | | |
| **Site Description** | | | | |
| A small pond with some dying plants around the edge. The water’s surface has a lot of dead fish. | | | | |
| **Weather Conditions** | | | | |
| There was some rain yesterday and a light frost this morning. It is cloudy and 9ºC. | | | | |
| **pH** | **Conductivity (μS/cm)** | **Total Dissolved Solids mg/L** | **Dissolved Oxygen mg/L** | |
| 6.7 | 450 | 520 | | 3 |