



Nature At Home

We hope to inspire kids of all ages to learn about the natural world and discover new connections to nature.



Pond Chemistry

View the video at DishmanHills.org/Nature-At-Home

This is based on testing the Dishman Hill pond water in early spring through mid-July, 2020.

TIME of Year	Temperature	Oxygen Level
Early Spring	50	10 milligrams per liter
June - when the reeds started to emerge	60	8 milligrams per liter
Mid-July	70	3 milligrams per liter

As the temperature goes up, the ponds ability to dissolve oxygen does down. This is expected to happen. Let's take a water sample and run some tests.

pH Test

The water is "green" from the algae growing in the pond. It's (The pH is) between 6 and 7, right where we would expect it to be.



Dissolve Oxygen Test

This test (uses) chemicals to (create) iodine in an equal proportion to the amount of oxygen in the water. The iodine turns the water a brownish color. If you measure the amount of iodine, it will give you the amount of oxygen that was in the water. There's a series of complicated chemical reactions that take place but eventually you are converting oxygen into iodine. Knowing the exact amount of water in the sample will allow one to find out the concentration of oxygen in that volume of water.



“Titration” is a method of finding exactly how much of a substance there is in a solution by gradually adding measured amounts of another substance that reacts to it in a known way; for example by causing a color change. In this test 20 drops of the titration liquid equal 4 milligrams per liter of oxygen. We used 15 drops, which means there are only 3 milligrams per liter of oxygen is in the pond; which is very low. This happens in warm weather to ponds. While they are warming up, the organisms in the pond use up the oxygen. No fish could survive in this pond right now as it doesn’t have enough oxygen for them to survive. Even fish that can handle low oxygen need at least 5 milligrams per liter.

Probably the biggest thing depleting the oxygen in the pond is the decomposition of all the organic matter; all the plants (grasses, reeds, and other vegetation) that are dying because of the summer heat. They then settle to the bottom of the pond and decompose. The bacteria that eat those plants are taking the oxygen out of the water. The pond is almost filled in with vegetation.

Total Hardness Test

This is basically the amount of calcium in the water. Surface water springs and ponds are generally very low because the water isn’t in contact with rocks. The pH level in water is also a factor in how much rocks are dissolved with sustained contact to water. The scale is from 0 (green) to 425 (pink). The reading on the hardness in the pond is close to 50.



Calcium comes from dissolving minerals from rocks. Calcium is an important element in ponds/lakes for the organisms that have shells (turtle, snails, clams) to survive. The crust you get on the bottom of a pan when you boil it dry is calcium carbonate from the hardness of the water. People put in water softeners in their homes to remove the calcium out of their water.



This pond is **hypereutrophic**; which means it has a lot of organisms (algae, reed, grasses) growing in it; but the oxygen is low so fish can’t survive. This is a natural part of a pond’s succession to a meadow. All the vegetation growing in here will eventually fill the pond in and there will no longer be a low spot; it will be a flat plane. Everything will decompose into a silty soil where trees and shrubs can grow.

If you have any questions, e-mail us at Education@DishmanHills.org