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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  Productivity Oxygen is critical to the maintenance of the life processes of nearly all organisms. In the aquatic environment, oxygen must be in solution in a free state before it is available for use by organisms. Its concentration and distribution in the aquatic environment are directly dependent on chemical and physical factors and are greatly affected by biological processes. In the atmosphere there is an abundance of oxygen with about 200ml of oxygen for every liter of air. Conversely, in an aquatic environment there is only about 5-10ml of dissolved oxygen (DO) in a liter of water.The measure of DO in an aquatic environment can be a very important indicator of water quality.  The rate of carbon dioxide utilization, the rate of formation of organic compounds, or the rate of oxygen production can be used as a basis for measuring primary productivity (all a consequence of photosynthesis). A measure of oxygen production over time provides a means of calculating the amount of carbon that has been bound in organic compounds over a period of time. For each ml of oxygen produced, approximately 0.536 mg of carbon has been assimilated.  One method of measuring oxygen production is the light and dark bottle method. In this method, the DO concentrations of samples of water are measured and compared after incubation in light and darkness. In the bottles with no aluminum foil covering its outer surface (exposed to light), the biological processes of both photosynthesis and respiration are occurring. In the bottles covered in aluminum foil (kept in the darkness), the change in DO from the initial concentration would reflect what has been lost as a consequence of respiration. The difference over time between DO concentrations in the light bottle and the dark bottle is the total oxygen productivity and therefore an estimate of GROSS PRODUCTIVITY.  **Light Bottle DO - Initial DO = Net Primary Productivity**  **Light Bottle DO - Dark Bottle DO = Gros Primary Productivity**  The greater the difference between the light bottle and dark bottle DO the greater the productivity of the creek. This test along with the others taken during our visit allows us to develop an accurate evaluation of the overall health of the ecosystem.  To measure DO we had been using LaMotte's snap off DO vials until the Fall of 2007. We are now using [Vernier LabPro](http://www.vernier.com/) equipped with a [DO sensitive probe](http://www2.vernier.com/booklets/do-bta.pdf) (below) which is connected to a laptop running [Logger Pro Software](http://www.vernier.com/soft/). Both methods of collection are very easy to use and provide accurate enough readings for establishing a baseline needed for comparison purposes.     |  | | --- | | Copyright © 2008 Amador Valley High. All Rights Reserved. Reproduction in whole or in part in any form or medium without express written permission of Amador Valley is prohibited. | |