*Effect of Temperature on Dissolved Oxygen Content in Water*

**Westminster College**

**TEACHER NOTES**

**TIME TO COMPLETE LAB:**

~40 min

**TARGET GRADE LEVEL:**

~7

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­10th

**OBJECTIVE/MAJOR CONCEPTS:**

* Study the effect of temperature on the amount of dissolved oxygen in water.
* Predict the effect of water temperature on aquatic life.

**PREPARATION:**

The manual calibration of the DO sensors does take at least 20 minutes. For the most efficient use of class time, it is recommended that the SIM mobile educator or the instructor perform this prior to the lab. This calibration should be performed each day of the lab, as local weather conditions may change enough to affect how the DO sensors read. Tables for barometric pressure conversion and 100% DO capacity are included at the end of the student lab protocol; the instructor may have to explain how to use these.

**EXTRA INFORMATION:**

1. If there is no time for manual calibration, there is an internal calibration for the

LabQuests which is the default when the equipment is turned on. As long as you keep the DO sensor attached to the LabQuest for both days of the experiment, the readings should remain fairly consistent.

1. If you need to use the sensors for several consecutive classes and/or days, the DO sensors should be placed in a beaker with water. For the best results, the sensors should also stay attached to the LabQuest until all the classes are finished.

**SAMPLE DATA:**

|  |
| --- |
| **Table 1. Individual DO at Different Temperatures**  |
| **Temperature (°C)**  | **Lab Group DO**  | **Lab Group % DO Saturation**  |
| 13  | 7.0  | 75  |
| 22.9  | 5.3  | 80  |
| 39.9  | 3.7  | 83  |

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**ANSWERS TO QUESTIONS:**

1. Why is it important to know the temperature of the water and the barometric pressure when you determine the DO content of your water?

*Both factors affect the total amount of oxygen that can be dissolved in water. Knowing these allow for a prediction about the maximum amount of DO that can be in the water being tested.*

1. Consider the difference between a stream and a pond. What factors (biological or physical) do you think affect the DO concentration in these two samples?

*In general, you would expect a higher DO reading in the stream water in comparison to the pond water. As the stream moves over rocks in the stream bed, the tumbling action oxygenates the water. Also, the shallowness of the stream means that more water comes in contact with the atmosphere, thus increasing the amount of oxygen carried in the water. The pond water may also be warmer than the stream water, decreasing the level of DO in it.*

1. Which water could support more organisms, the pond or the stream? Why?

*Given the above answer, the stream will probably support a larger variety of organisms because its dissolved oxygen content is higher.***Westminster College SIM** Page 2