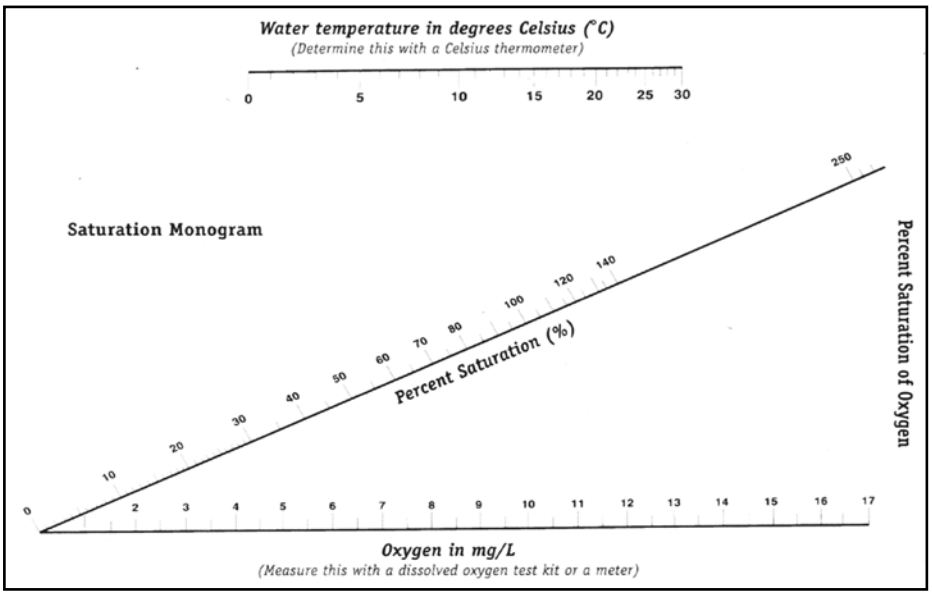
What is dissolved oxygen?

Dissolve oxygen (DO) is simply the oxygen that is dissolved in water. Stream and river systems both produce and consume oxygen. Waters gains oxygen from the atmosphere and from plants as a result of photosynthesis. Running water, because of its churning, dissolves more oxygen than still water, such as that in a reservoir behind a dam. Respiration by aquatic animals, decomposition, and various chemical reactions consume oxygen. If more oxygen is consumed than is produced, dissolved oxygen levels decline and some sensitive animals may move away, weaken, or die. Wastewater from sewage treatment plants often contains organic materials that are decomposed by microorganisms, which use oxygen in the process. The amount of oxygen consumed by these organisms in breaking down the waste is known as the biochemical oxygen demand (BOD).



DO levels fluctuate seasonally and daily! The levels also vary with water temperature and altitude. Cold water holds more oxygen than warm water and water holds less oxygen at higher altitudes. Thermal discharges, such as water used to cool machinery in a manufacturing plant or a power plant, raise the temperature of water and lower its oxygen content. Aquatic animals are most vulnerable to lower DO levels in the early morning on hot summer days when stream flows are low, water temperatures are high, and aquatic plants have not been producing oxygen since sunset.

Instead of using (mg/L) or (ppm) to report your DO results, it is sometimes more useful to determine percent saturation. Percent saturation varies with temperature, altitude, motion of the water and barometric pressure. The actual calculation of these relationships can be complex, so we use a saturation monogram to estimate percent saturation.

Dissolved Oxygen (**5860**)

Note: The test can be completed if starch is not added. Simply titrate until the yellow solution is clear.

1. Clean the DO-bottle by rinsing with sample water or distilled water (3-times) then fill the bottle completely, no spaces, with your sample water. There should be no air bubbles in the bottle.
2. Add 8-drops of Manganese Sulfate (4167).
3. Add 8-drops of Alkaline Potassium Azide (7166).
4. Cap the bottle and mix thoroughly, a precipitate will form. Allow the precipitate to partially settle.
5. Add 8-drops of 1:1 Sulfuric Acid (6141WT). Cap and mix until the precipitate dissolves.
6. Fill the test tube to the 20-mL line with the sample from the DO-bottle. Add 8-drops of Starch Indicator, a dark blue color will develop (See the note below the picture).
7. Fill the titrator with Sodium Thiosulfate (4169) by pushing the titrator into the bottle, and then turn the bottle upside down and pull the plunger on the titrator until the liquid reaches the zero-line.
8. Remove the titrator and push it into the cap at the top of the sample bottle; slowly titrate by adding the solution drop-by-drop into the test tube, swirling after each drop.
9. Continue the titration until the blue color just disappears.
10. Read the scale and record your result as ppm DO; determine the % saturation using the monogram scale provided