



Hydrolab® Answer Key

Graph 1

1. How does the temperature of Flathead Lake change with depth?
It's typically warmer closer to the surface than in the deeper parts of the lake. The lake water is usually coldest in the deepest parts of the lake. This holds true except for January where the entire water column is virtually the same temperature.
2. What happens to the temperature of the lake in the deepest 10 meters (90 to 100 meters)?
No matter the season, the temperature in the deepest layers of the lake (90 to 100 meters) hovers right around 4°C.
3. What causes the temperatures to change over the seasons?
The temperature of the water changes over the seasons due to change in air temperature and increased sunlight. As the days get longer, the sun heats up the earth and the water. This means that the surface layers of the water start to warm up. In fall, we see less solar radiation and more wind. The wind helps to mix the cooling lake water until the entire lake is essentially the same temperature. It takes a lot of energy to heat and cool water, so it takes a long time to raise the temperatures in the lake in spring and a long time for the heat to leave the lake in fall.
4. During what months could mayfly larvae hatch?
Mayfly larvae could hatch starting in May and again in November. While water temperatures in November may still be warm enough for mayfly hatching, hatches may not occur due to the impending winter and cold temperatures. January is too cold and August is too warm for larvae to hatch.
5. Extra Credit: What temperatures in ° Fahrenheit would mayfly larvae be able to hatch at?
46°F to 56°F





Graph 2

1. How are the maximum amounts of dissolved oxygen and algal biomass related to water temperature?

Dissolved oxygen and algal biomass concentrations start to increase and peak between a depth of 10 meters and 30 meters. As the temperatures in the lake start to cool and level off around 40°F, the dissolved oxygen and algal biomass also decrease and level off. Dissolved oxygen and algal biomass are greatest in water temperatures between 43°F and 55°F.

2. What happens to the amount of chlorophyll and amount of oxygen in the water column as you get deeper in the lake?

As you get deeper in the lake the amount of chlorophyll and dissolved oxygen greatly decreases from what it was closer to the surface. This is in part due to the lack of sunlight at lower depths, making it hard to impossible for photosynthesizing organisms such as phytoplankton to survive. Since oxygen levels are higher in the atmosphere, the highest levels of dissolved oxygen tend to be near the surface of the water. Photosynthesizing organisms like plankton and algae produce oxygen. Since these photosynthesizers depend on sunlight, they tend to produce more oxygen closer to the surface of the water.

