Effects of Nitrates on Aquatic Ecosystems

A biologist obtained a sample of water from Lake Erie every week for ten weeks starting in early May. She analysed the samples in the lab each week and monitored the nitrate levels, number of phytoplankton and Bacteria in the samples. Her results are recorded in the chart below:
Plot the numbers of Phytoplankton and Bacteria against week number on the same graph.
Plot Nitrate Levels against week number.

Week Number	Nitrate Levels (ppm)	Number of Organisms	
		Phytoplankton	Bacteria
0	0	5	1
1	0.5	8	3
2	4.5	64	13
3	8	250	30
4	9	600	33
5	4	700	35
6	2	900	340
7	1	120	570
8	0.9	45	450
9	0.5	15	125
10	0.3	4	110

1. Draw a food chain for lake Erie.
2. Identify the role of phytoplankton and Bacteria in the ecosystem.
3. Explain why the nitrate levels may have increased so dramatically in May.
4. a) Describe the relationship between nitrate levels and Phytoplankton.
   b) Explain why this relationship exists.
5. a) Describe the relationship between Phytoplankton and Bacteria.
   b) Explain why this relationship exists.
6. a) How might the oxygen levels in the lake change throughout these 10 weeks?
   b) What causes this change?
   c) What effects might this have on the lake ecosystem?