Graphing Skills

The Effect of Temperature on Bioremediation

When an oil spill occurs in the ocean, certain factors can influence the effectiveness of oil-eating bacteria in cleaning up the spill during bioremediation. These factors include such things as the water's pH level, amount of oxygen, amount of certain minerals (e.g., calcium, magnesium, and iron), as well as its temperature. Factors that increase the growth of oil-eating bacteria will increase the rate of bioremediation, since the more bacteria there are, the faster the oil will be cleaned up.

Below are the results of an experiment conducted by researchers who wanted to know how the water temperature would affect the rate of bioremediation. They took a 16-ounce sample of water where an oil spill had occurred and measured its temperature (20 °C) and the amount of oil-eating bacteria in the sample (about 18 million). The researchers then divided the sample into two 8-ounce beakers. In one beaker, they gradually heated the water over a flame. In the other beaker, they gradually cooled the water by placing it in a freezer. The researchers checked both water samples at every five-degree change to determine the amount of bacteria in each sample. The table at right contains the results of their experiment.

Draw a line graph that shows how the amount of bacteria changes depending on the temperature of the water they are in. After you have graphed the results, answer the questions below.

Effect of Temperature on Amount of Oil-Eating Bacteria in an Oil Spill

Temperature of water (°C)	Amount of bacteria (in millions)
0	1
5	5
10	9
15	13
20	18
25	25
30	33
35	48
40	68
45	99
50	20
55	7
60	0
65	0

Questions

1. At what temperature will there be the greatest amount of bacteria? _____
2. At what temperature(s) will there be fewer than 5 million bacteria? _____