

Name: _____ Period: _____

Nutrient Runoff

Background:

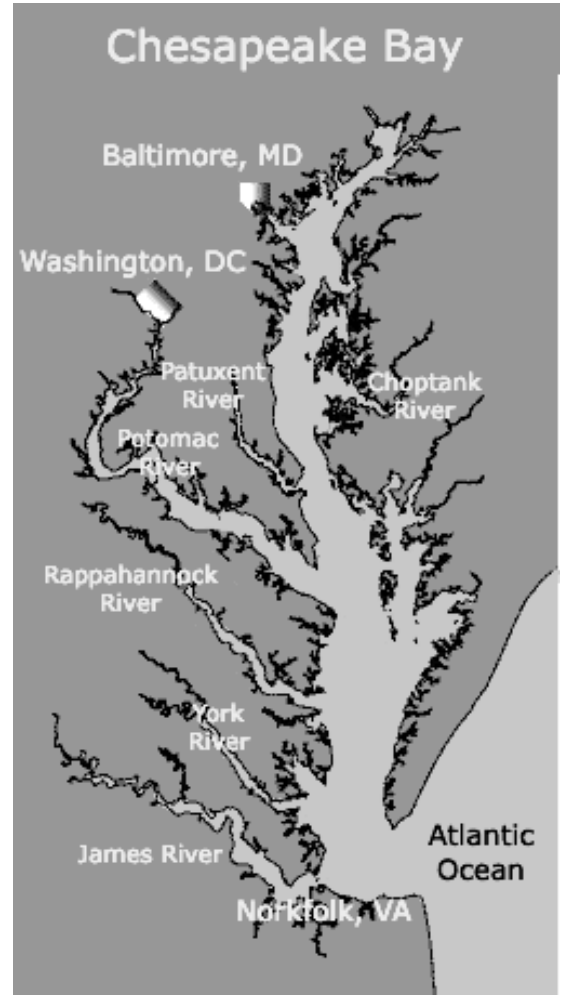
Many farmers and homeowners add a plethora of fertilizers to their plants and crops. Their primary goal is to increase the amount of crops and health of their plants. Many of the fertilizers contain nitrogen and phosphorus, also known as nutrients, are considered pollutants when they are used in excess. The nutrients run off into the Chesapeake Bay when precipitation occurs. With an increase in the nutrients running off into the bay, the result is an increase in algal blooms. Algae blooms float on top of the water, decreasing the amount of sunlight reaching the bottom of the bay. Consequently, the decrease in sunlight causes bay grasses, a vital organism in the Chesapeake Bay ecosystem, to decrease the amount of oxygen released into the bay. With this decrease in oxygen, many fish, wildlife and plants cannot survive.

Activity

Students will examine several water samples and test for the amount of pollutants, specifically Nitrogen, in their sample.

Directions:

1. Gather safety supplies: Gloves on hands and goggles on eyes
2. One water sample is placed on each of the lab stations.
3. Each lab group will test one of the samples. Then each group will rotate to the other stations to observe the other samples and record the nitrogen level in the data table.
4. To test the nitrate level of the sample, first use the eye dropper to place 3 mL of the sample water into the calibrated test tube.
5. Then add enough Nitrate Test Solution #1 (2 mL) to bring the sample up to 5 mL in the test tube.
6. Place the cap on the test tube and mix vigorously.
7. Carefully remove the cap on the test tube.
8. With a plastic spatula, add 2 level measures of the Nitrate Indicator Powder #2.
9. Replace the cover on the tube and shake vigorously until the powder is completely dissolved. Allow it to stand for 2 to 5 minutes for the color to develop.

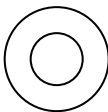


10. Using the color key at the lab bench, determine the nitrate level in the water and record in data table under trial 3.
11. Calculate the average nitrate level for each sample.
12. Leave the sample at the lab station for other groups to observe.

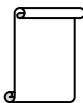
Key and Information

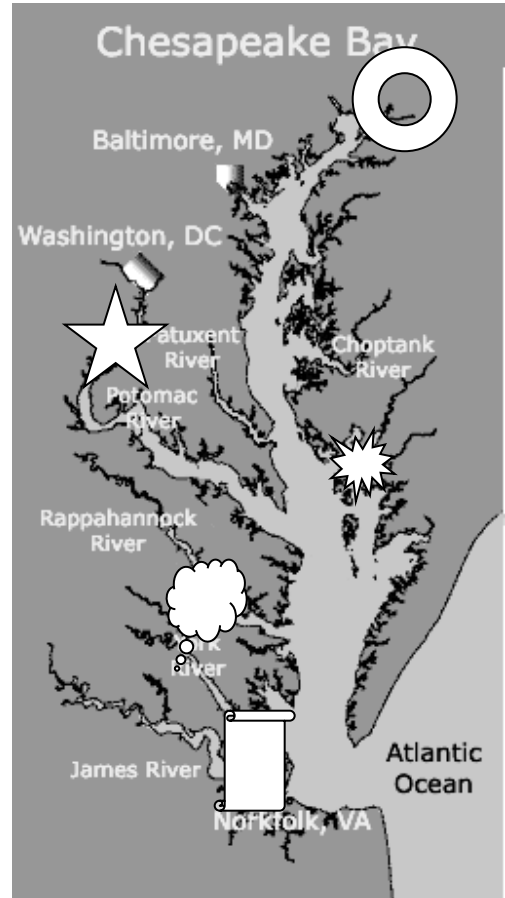
Sample A -  Poultry Farm

Sample B -  Golf Course

Sample C -  Rural Land

Sample D -  Land Fill

Sample E -  Fruit and Vegetable Farm

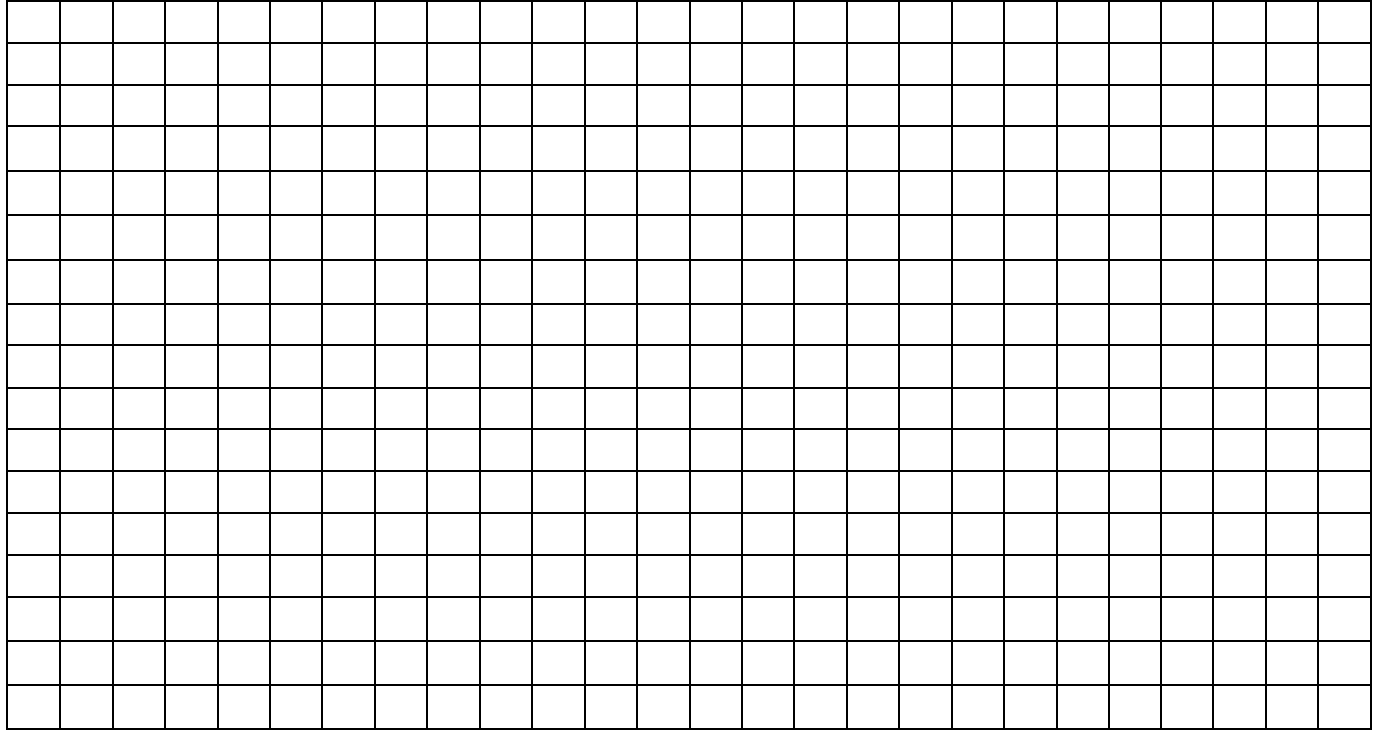


Data Table

Amount of Nitrate at Different Sample Stations along the Chesapeake Bay

Sample	Trial 1	Trial 2	Trial 3	Average
A	5	4		
B	5	7		
C	0	0		
D	4	3		
E	2	3		

Graph



Analysis

1. Identify the difference in Nitrate levels between sample B and C. Explain the differences and the possible causes.

2. Explain why sample A, B and D have the greatest amount of Nitrates in the Bay

3. Explain the effect of an increase of nitrates on the algae located in the Chesapeake Bay

4. Explain the effect of an increase of nitrates on the bay grasses located in the Chesapeake Bay

5. Explain the effect of an increase of nitrates on the amount of oxygen located in the Chesapeake Bay

6. Explain the effect of an increase of nitrates on the amount plants, animals and other wildlife living in the Chesapeake Bay

7. List 2 ways that humans impacted the amount of nutrients in the Bay and explain

8. Your family is about to plant a new garden, what suggestions would you make to your parents to decrease the amount of nutrients running off into the bay
