

Water Quality Testing

Name _____ Date _____ Period _____

Question Part 2: How do common chemicals affect water quality?

You will be testing the effects of soaps, fertilizers, pesticides, and petroleum based products on water quality.

Hypothesis: Prediction Chart

| | pH: Acid, Neutral, or Base | Nitrites: Safe or Unsafe | Phosphates: Safe or Unsafe | Chloride: Safe or Unsafe |
|-------------------|---------------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|
| Soap | | | | |
| Fertilizer | | | | |
| Petroleum Product | | | | |
| Pesticide | | | | |

Materials:

Soap water Petroleum water Testing supplies
Fertilizer water Pesticide water

Procedures:

Procedures will be at your lab stations. Follow all lab procedures carefully and clean your area as directed.

Data Table 2:

| Chemical Type | pH (A) | Nitrites (B) | Phosphates (C) | Chloride (D) |
|---------------|--------|--------------|----------------|--------------|
| Soap | | | | |
| Fertilizer | | | | |
| Gasoline | | | | |
| Pesticide | | | | |

Use Data Table 2 to answer the following questions in complete sentences.

How does pH vary between these water samples? _____

How do nitrate levels vary between these samples? _____

How do phosphate levels vary between these samples? _____

How do chloride levels vary between these samples? _____

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Water Quality Information

| Water Quality Indicator | Safe Levels | Sources | Effects of Unsafe Levels |
|-------------------------|---|---|--|
| pH | Between 6.5 and 9 | Decaying matter causes acidic conditions; | Too high or too low can kill organisms; NOT all organisms can live in 6.5 to 9 range |
| Nitrate | <1mg/L for aquatic life; <10mg/L for drinking | Fertilizers, animal wastes, decomposing matter | Can cause excessive plant and algae growth in a process called eutrophication; this process harms or kills animals and can kill plants due to overcrowding |
| Phosphate | 0.01 to 0.03mg/L | Phosphate containing rocks and solids; animal waste, fertilizers, pesticides, cleaning products, and industrial processes | Can also cause excessive plant and algae growth in a process called eutrophication; (see above); |
| Chloride | 0.01mg/L for aquatic life; <1.0mg/L for drinking | Added to drinking water and swimming pools to kill microorganisms that might cause disease | High levels can harm larger organisms; Chlorine gas is toxic, can irritate eyes, nasal passages, and lungs |

Source: <http://www.h2ou.com/h2wtrqual.htm>

Part 1: Use your data from Question 1 to answer the following questions. Use complete sentences.

1. Which water source had the best water quality? Use your data to support your answer.

Part 2: Use your data from Question 2 to answer the following questions. Use complete sentences.

2. Which water quality tests were affected by the addition of soap? _____

3. Which water quality tests were affected by the addition of fertilizer? _____

4. Which water quality tests were affected by the addition of gasoline? _____

5. Which water quality tests were affected by the addition of pesticides? _____

Use the data from Part 1 and the information from Part 2 to answer the following questions:

6. Is the soap water sample "safe"? Use data to support your answer. _____

7. Is the fertilizer water sample "safe"? Use data to support your answer. _____

8. Is the gasoline water sample "safe"? Use data to support your answer. _____

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9. Is the pesticide water sample "safe"? Use data to support your answer. _____

10. Which of these chemicals had the greatest impact on the water? Explain your reasoning using data from the experiment.

11. What is runoff?

12. Track the path of soap water from your household to a water source? _____

13. How might fertilizer make its way to a water source? _____

14. In what ways might petroleum based products enter a water source either directly or indirectly?

15. How might pesticides enter a water source? _____

16. Which sources of water do you use in your house for drinking? _____

17. Which sources of water does the school use for drinking? _____

18. For each of the sources named in #16 and #17, explain why it is safe or unsafe.

- _____
- _____
- _____
- _____
- _____