

# Water Quality Testing

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

You will be running four different water quality tests on the provided samples.

Water Test	Information	Safe Levels for Living Organisms
pH	Scale of 1 to 14; pH=7=neutral; pH<7= acid; pH>7= base	6.5 to 9
Nitrate	Nitrogen and oxygen containing chemicals	<1mg/L for aquatic life; <10mg/L for drinking
Phosphate	Phosphorus containing chemicals	0.01-0.03mg/L
Chloride	Chlorine levels	<0.01mg/L for aquatic life; < 1.0mg/L for drinking

## Question Part 1: How does water quality vary in different water samples?

You will be testing tap water, bottled water, and outdoor water to find how they differ.

### Hypothesis: Prediction Chart

Water Source	pH: Acid, Neutral, or Base	Nitrites: Safe or Unsafe	Phosphates: Safe or Unsafe	Chloride: Safe or Unsafe
Tap Water				
Bottle Water				
Distilled Water				
Outdoor Water (          )				

### Materials:

Tap water                                  Bottle Water                                  Distilled water  
Outdoor water(                                  )                  Testing supplies

### Procedures:

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

### Data Table 1:

	pH (A)	Nitrites (B)	Phosphates (C)	Chloride (D)
Tap Water				
Bottled Water				
Distilled Water				
Outdoor Water (          )				

Use Data Table 1 to answer the following questions in complete sentences.

How does pH vary between tap, bottled, distilled, and outdoor water? \_\_\_\_\_

\_\_\_\_\_

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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## 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

	<b>pH: Acid, Neutral, or Base</b>	<b>Nitrites: Safe or Unsafe</b>	<b>Phosphates: Safe or Unsafe</b>	<b>Chloride: Safe or Unsafe</b>
Soap				
Fertilizer				
Roadside soil sample				
Agricultural soil sample				

### 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				
Roadside soil sample				
Agricultural soil sample				

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 roadside soil sample? \_\_\_\_\_

\_\_\_\_\_

5. Which water quality tests were affected by the agricultural soil sample? \_\_\_\_\_

\_\_\_\_\_

**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 roadside water sample “safe”? Use data to support your answer. \_\_\_\_\_

\_\_\_\_\_

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9. Is the agricultural 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.

• \_\_\_\_\_

\_\_\_\_\_

• \_\_\_\_\_

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