**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Class\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Virtual Lab: When Is Water Safe To Drink?**

Suppose you were hiking along a stream or lake and became very thirsty. Do you think it would be safe to drink the water? In many cases, it wouldn't. Each source of fresh water on or beneath Earth's surface is affected by contaminants. Though the sources of these contaminants are varied, all can make water unfit to drink if they are allowed to increase beyond safe limits.

Go to the website:

<http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT04/CT04.html>

In this Virtual Lab, you will test a variety of water samples. Then you will determine how to treat the water samples to make them safe to drink

Look at the screen to your left, **READ** and find out about the most common types of water contaminants. Describe what they are and how they might affect water quality.

**Acidity:**

**.**

**Bacteria:**

**Metals:**

**.**

**Nitrates:**

**Pesticides:**

**Objectives:**

1. ·Define types of water contaminants.
2. ·Determine which types of contaminants are common to lake water, city water, well water, rural water and mountain water.
3. ·Identify treatments that remove contaminants from drinking water.

**Procedure:**

1. Click the right and left arrows to select a body of water to analyze.

2. Click **Test** to test the water sample.

3. Look at the results of the water analysis. Identify the “Safe Range” for each category and record this in the data table.

4. Identify which contaminants exceed the safe range.

5. Click the tabs to find information on how to treat each contaminant.

6. Enter the contaminant and treatment information in your data table.

7. Click Go To **Treatment** to go to the treatment screen.

8. Use the information in the table and click **the wheels** on the valves to add chemicals or additives to the water sample.

9. Click the **Treatment Switch** to start treating the water. The **Safe/Unsafe** Sign will indicate whether the water is safe to drink.

10. If the water is **safe** to drink, use Return to Lab to go to the lab screen and test another water sample.

11. If the water is **unsafe** to drink, check your information and treat the water sample again.

12. When you have tested and treated all the water samples, use your completed table to complete the analysis questions.

**Analysis**

1. What contaminants were found in the surface water samples? What contaminants were found in the groundwater samples?
2. Why might groundwater and surface water have different contaminants?
3. Generally, farmers do not farm on the sides of mountains or in remote areas. Industries also do not build factories in these areas. These areas are usually not highly populated by people. What might explain the high nitrate level in the mountain water in this activity?
4. What is pH level, what are its characteristics, and how does it contribute to pollution? What chemicals are used in treating low pH levels?

**Critical Thinking-Please read this carefully!**

Water in an old building tested recently, showed high copper and iron content, and low pH levels. A water reading taken 20 years before, showed low pH levels and only minimal traces of copper and iron. If none of the new buildings on the same street showed signs of metallic contaminants, but all reported lower than normal pH readings, how might these readings be explained?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **Acidity (pH)** | **Metals (mg/L)** | **Coliform Bacteria (ml)** | **Pesticides/Herbicides (mg/L)** | **Nitrates** | **Type of Contamination**  | **Treatment Performed** |
| **Safe Range** |  |  |  |  |  |  |  |
| **City** |  |  |  |  |  |  |  |
| **Lake** |  |  |  |  |  |  |  |
| **Mountain** |  |  |  |  |  |  |  |
| **Rural** |  |  |  |  |  |  |  |
| **Well** |  |  |  |  |  |  |  |