

**WATER QUALITY TESTING**

**Project Overview:**

This experiment examines different aspects of our water quality including pH, nitrate levels, phosphate levels, and organismal activity.

* **Appropriate grade levels:** 3rd and up
* **Set-up and initial assessment:**About 2 hours, including water collection and microscope analysis
* **Total days:** 5

**Materials Needed for Each Pair of Students:**

* Plastic beaker
* Water collection tubes
* Nitrate and nitrite testing strips
* Phosphate testing strips
* pH testing strips
* Water from the tap
* Water from a local body of water
* Microscope

**Safety:**

* Situational awareness while outside collecting samples.

**Introduction**: VIDEO

**Procedure:**

First collect your water samples. Clearly label your collection tubes with your water collection site. Note if it is tap water or water from an outside source, the date collected, and the specific location it was collected from. The outside sample should also be labeled with the type of water body the sample was collected from (lake, river, stream, puddle, etc.).

Bring the samples back to the room for testing. You will be testing the water samples for nitrate and nitrite levels, phosphate levels, pH levels, and also for the presence of microorganisms, which you will look for under the microscope.

Before pouring your samples into the beakers for testing, clearly label the beakers with which water sample is in which beaker. This can be done by labeling tape and placing the tape on the beaker so that the beaker may be reused.

Once your beakers are labeled, pour your water samples into them.

# Nitrate and Nitrite Testing

Remove two test strips from the container, one for each water sample. Dip the test strips into each water sample for two seconds and remove. Wait one minute for results. After one minute, compare the color of the test strip to the colors on the bottle to determine the level of nitrate and nitrite in your water.

Determine if your samples have a good, fair, or poor quantity of nitrate and nitrites:

 **Good:**  Less than 5 ppm

 **Fair:**  5-10 ppm

 **Poor:** Greater than 10 ppm

# Phosphate Testing

Using the same water samples, remove two test strips from the container, one for each water sample. Dip the test strips into each water sample for one second and remove. Wait three minutes for results. After three minutes, compare the color of the pad on the test strip to the colors on the bottle to determine the level of phosphate in your water.

Determine if your samples have a good, fair, or poor quantity of phosphate:

 **Good:**  The closer to zero the better

 **Fair:**  10 ppm

 **Poor:** Greater than 10 ppm

# pH Testing

Using the same water samples, remove two test strips from the container, one for each water sample. Dip the test strips into each water sample and remove immediately. Compare the color on the strip to the color chart on the bottle.

Determine if your samples have a good, fair, or poor pH level:

 **Excellent:**  7 (neutral)

 **Good:**  6-8 range (6 is slightly acidic, 8 is slightly basic)

 **Poor:** 0-5 (acidic) or 9-14 (basic)

**Questions to Ponder:**

1. Which type of water is the best/healthiest?
2. What are some ways to prevent water pollution?

**Science Standards Covered**

1. Building a scientific vocabulary​
2. Organizing science information​
3. Visualizing data​
4. Thinking Critically​