

What's In The Water



Purpose:

Learn how to know how to complete a water quality test on a local water source and in what ways we can make a difference in our community's waterways.

Objectives:

- Students will interpret the result of a pH test
- Students will identify two reasons why water testing is an important practice.
- Students will devise two ways in which they can help our waterways.

Materials:

- pH Testing Kit
- pH Chart

Time Required: 1 hr

Appropriate grades: K-12

NGSS and Common Core Standards:

HS-ESS3-5.

Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

2-PS1-2.

Analyze data obtained from testing different materials to determine which materials have the

Activity: (Can be done at a stream or in the classroom with samples from a stream)

<p>Introduction</p>	<p>Student Discussion (Think, Pair, Share)</p> <ol style="list-style-type: none"> 1. Has anyone heard the word "pH" before? What is it? <ul style="list-style-type: none"> ○ pH is a scientific measuring tool having to do with how acidic or alkaline/basic a substance is. Everything has a pH from your socks to some delicious pickles. 2. Pass around the PH Chart, and have the students make observations <ol style="list-style-type: none"> A. What on the scale is Alkaline? <ul style="list-style-type: none"> ○ Laundry Detergent B. What on the scale is Acidic? <ul style="list-style-type: none"> ○ Coffee C. What on the scale is Neutral? <ul style="list-style-type: none"> ○ Tap Water D. What pH of the water would you want to be swimming in, if you were a fish, and why? <ul style="list-style-type: none"> ○ You would want fish to be swimming in a pH of 6.5-7 (neutral). The reason for this is that fish cannot grow and survive in acidic or alkaline water.
<p>Body</p>	<ol style="list-style-type: none"> 1. Explain the recommended safety instructions (found in kit) 2. Divide students into 3-4 groups

	<p>3. Test the pH</p> <ol style="list-style-type: none"> a. 1 control of tap water and 2 river samples b. Instructions are in the pH Box <p>Assessment: Exemplary students will be able to get an accurate pH test</p> <p>4. Compare and contrast results from the different groups.</p> <ol style="list-style-type: none"> a. Do you think all the samples came from the same place? Why ?
Closure	<p>Debrief (think, pair, share):</p> <ol style="list-style-type: none"> 1. Why do we care about testing the pH? <ul style="list-style-type: none"> ○ By knowing what the pH of the river is, we can determine the health of the river, and understand what animals can survive in this waterway. It can also help us to determine what we can do in the future to clean up the river. <p>Assessment: Exemplary students will be able to give 2 reasons why ph testing is important</p> <ol style="list-style-type: none"> 2. What you think can make a stream or creek unhealthy? <ul style="list-style-type: none"> ○ Pollution, agriculture, clear cutting (getting rid of riparian habitat that it filtering out pollution) 3. What can we do to help? <ul style="list-style-type: none"> ○ Citizen science: give results of research to a local organization ○ Stewardship: Clean up the water by planting willow trees or other riparian plants, picking up garbage in or around a waterway. <p>Assessment: Exemplary students will be able to give 2 ways they can help our waterways.</p>

Modifications:

- **Elementary:** Model the experiment, then use guided practice as students complete it.
- **Middle School:** Use guided practice while students complete the experiment
- **High School:**
 - Let the students work as a team to complete the experiment
 - Have students develop a written plan at the end of how they want to help their local waterways

****All ages:** Take students to a local waterway and do a stewardship project to clean up their local waterways. ex: Plant willow trees by needed waterways, clean up pollution by the waterways, test the pH of a local waterway and give results to local scientists.

