

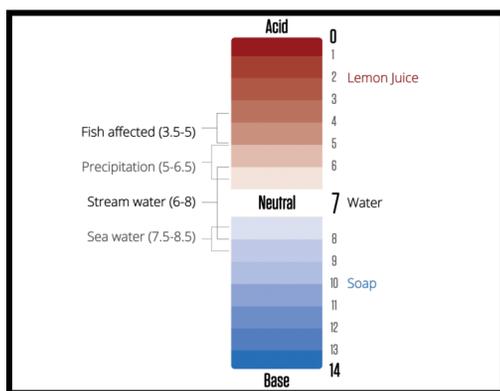
	Comparing pH of household items	Date	xx/xx/20xx
Grade/level	4-8	Length	55-60 minutes
Brief Description			
<p>Students will test the pH of the control, then add an acidic substance, testing the pH again. Then they will add a basic substance to a new sample. All results will be recorded either on Water Rangers notepaper or printed handouts/scrap.</p> <p>After the lab is carried out, students will be provided with a handout of questions intended to foster further inquiry. Students can brainstorm and answer these in groups, or with the instructor.</p>			
Guiding Question(s)			
What is pH? How do certain household products change the pH of water?			
Curriculum Connections			
This lesson applies generally to all of our curriculum mapping. For more information, see https://waterrangers.ca/curriculum-mapping/			
Learning Goals:		Success Criteria	
<p>Today I will:</p> <ul style="list-style-type: none"> - Learn about what pH is - Test the pH of water - Change the makeup of my water using different items - test for changes in pH - Record my result 		<p>I can:</p> <ul style="list-style-type: none"> - Understand what pH is, and what acidic and basic mean - Demonstrate how irregular pH can be harmful to life in waterways - Perform a lab experiment and record my results 	

<p>Why?</p> <ul style="list-style-type: none"> - pH is an important part of water health - pH changes can affect life in and out of the water - pH changes naturally but also in response to pollutants, we need to understand when and why. 	
<p>Learning Skills and Work Habits</p>	<p>Learning Environment</p>
<p>Responsibility Organization Independent Work Collaboration Initiative Self-Regulation</p>	<p>Indoors: Classroom or activity centre Science lab Outdoors: Activity area, picnic table, dock, etc</p>
<p>Resources and Materials</p>	<p>Technology Integration</p>
<p>Water Rangers teststrips Pen/Pencil notepad or scrap paper Containers for samples Lemon juice OR vinegar Baking soda OR dish soap</p>	<p>Use of videos Use of visual aids Option to write lab results digitally</p>
<p>Considering any exceptionalities</p>	
<p>Provide written summary of lesson to supplement instruction, in either note or digital form. Any colour test will cause trouble for the rare students with selective colour blindness - the pH parameter will be difficult for red-green colourblind students to see. Perhaps provide a chart: (from https://venngage.com/blog/color-blind-friendly-palette/)</p>	
<p style="text-align: center;">Lesson Breakdown</p>	
<p>Introduction (10-15 minutes)</p>	
<ul style="list-style-type: none"> • Present household items (baking soda, soap, vinegar, orange juice etc) and ask students what these items do 	

- Explain products that students are unaware of in plain language
- Introduce the idea of acids and bases, apply prior knowledge if this has been discussed before (https://www.youtube.com/watch?v=V5Mq_cL9Bck good for intermediate and senior learners)

Introductory information

- pH stands for “potential for Hydrogen”
- pH is measured on a scale; lower numbers are more "acidic," while higher numbers are more "basic"
- Pollution can change pH levels
- Acid rain and mining run-off can lead to acidic, lower pH water. Low pH can make it difficult for life to exist in waterways.



→ Use this scale that we have designed as a visual aid for your students when explaining what pH values mean.

→ Have students reflect upon the scales on the back of their test strip containers.

→ Further reading here: <https://waterrangers.ca/testkits/tests/ph-in-freshwater/>

Lesson Body (30-40 minutes)

Starting the lab: Break students into groups, and explain the following steps:

- Take a sample of water and dip a test strip into it. record the results. this will be your *control*.
- Next, take another water sample and add a small amount of one of your household products to it. Test for pH, record the results. What do you notice?
- Repeat this step using each product you have!
- Explain that students are creating acidic or basic **solutions**
- If you need additional aids, use this brief video we made for using teststrips: https://www.youtube.com/watch?v=FyyonM36rF4&feature=emb_logo

The closeout (10-15 minutes)

Questions for further understanding:

- Which solution changed your pH the most?
- Which solutions ended up with a higher/lower reading? What does higher/lower pH mean?
- How might water with a high/low pH affect the plants and animals?