



# What's the pH?



## *Raccoon Creek Explorers Activity 3*

### **Supplies:**

- A container with a lid that can hold water
- A pair of shoes that can get dirty
- About two cups of red/purple cabbage
- A knife (use with adult supervision)
- Filter paper or strainer
- Boiling water
- Clear glass containers and a heat proof container
- Cooler (optional)

**Time:** 40 - 60 minutes

### **Vocabulary:**

pH: is a scale used to specify the acidity or basicity of a solution and is used for measuring water quality.

pH scale: The range goes from 0 - 14, with 7 being neutral. pHs of less than 7 indicate acidity, whereas a pH of greater than 7 indicates a base. Most fish and aquatic life prefer to live in water with a pH ranging between 6.5 to 9.0.

Chemistry: is the study of matter and its interactions with other matter and energy.

Acid mine drainage: the outflow of acidic water from a mining site.





## **Background:**

pH is important when looking at the quality of water. Fish and other aquatic life can't live in water that has too high or low of a pH. pH is measured on a scale of 0 - 14 with 7 being neutral (health). A pH lower than 7 is an acid and a pH higher than 7 is a base. Pollution is one of the factors that can drastically change the pH of water. In the Raccoon Creek watershed acid mine drainage enters the watershed from many historical abandoned coal mines. The water from these mines is acidic meaning they can lower the pH of water to about 1-5 pH.

Raccoon Creek Partnership checks the water chemistry of the Raccoon Creek watershed often in order to make sure all the restoration projects are still in tip top shape. One of the most important measurements we record is the pH. In this activity you'll be able to sample a local water source and find out its pH.

## **Let's Start!**

1.) Collect your water sample. Make sure to wear weather appropriate clothes and shoes (it may be muddy close to the water). It doesn't matter what body of water you collect your sample from, but make sure you collect it on public land and you're not trespassing. Make sure not to muddy up the water by stepping around too much. If you mucked up the water wait a bit for the water to clear up. Rinse your container three times with the water from your collection source and then fill your container with your water sample.





2.) Preserve your sample. Keep your water you collected in a cooler with some ice or ice packs if you collected your water far from home. If the water was collected close to home than a cooler is less necessary. Put water sample in the fridge until your ready for the last step. Keeping your sample cold will keep the pH from changing too much.

3.) Make your pH solution. This step you'll need help from an adult! Chop the cabbage into small pieces. Chop enough cabbage until you have around 2 cups of chopped cabbage. Put cabbage into a large heat proof container and pour boiling water over the cabbage. Add enough water to cover the cabbage. Let your cabbage it set for at least 10 minutes.

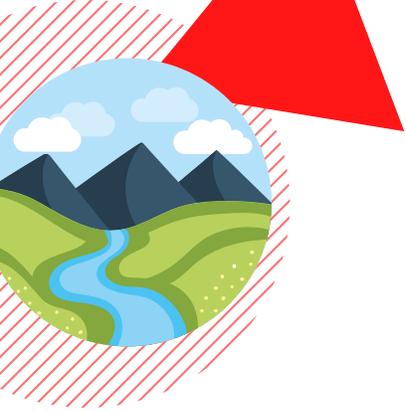
4.) Filter or take out all the cabbage for the water. Be careful it may still be hot. Your water should be red-purple-bluish in color and have a pH around a neutral 7.

5.) The cabbage water you just made will now act as your pH indicator. Now you can add your pH indicator to your water sample. The indicator will change color and tell you the pH of your water.

Here's the key to the colors:

- Red: 2 pH
- Purple: 4 pH
- Violet: 6 pH
- Blue: 8 pH
- Blue-Green: 10 pH
- Greenish Yellow: 12 pH





### **Reflect:**

What was your pH? Why do you think your pH was that way?

What color was the water you sampled? Was it clear, murky, orange, or etc.

Do you think the location you collected your water was affected by something that changes pH?

### **Apply:**

Why is it helpful to know the pH of water?

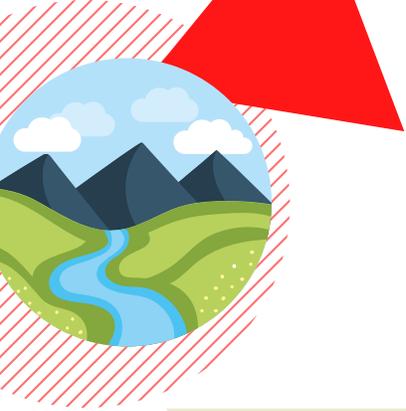
Is your water samples quality high enough for aquatic life to use?

When comparing your water sample to other types of liquids, what other liquid would have a similar pH?

### **Wrap Up:**

We all need good quality water in order to live happy and healthy lives. This is especially true for the animals living in the water. Raccoon Creek watershed's pH is consistently checked as well as other water measurements to make sure Raccoon Creek continues to be a health creek for the plants and animals of the watershed.

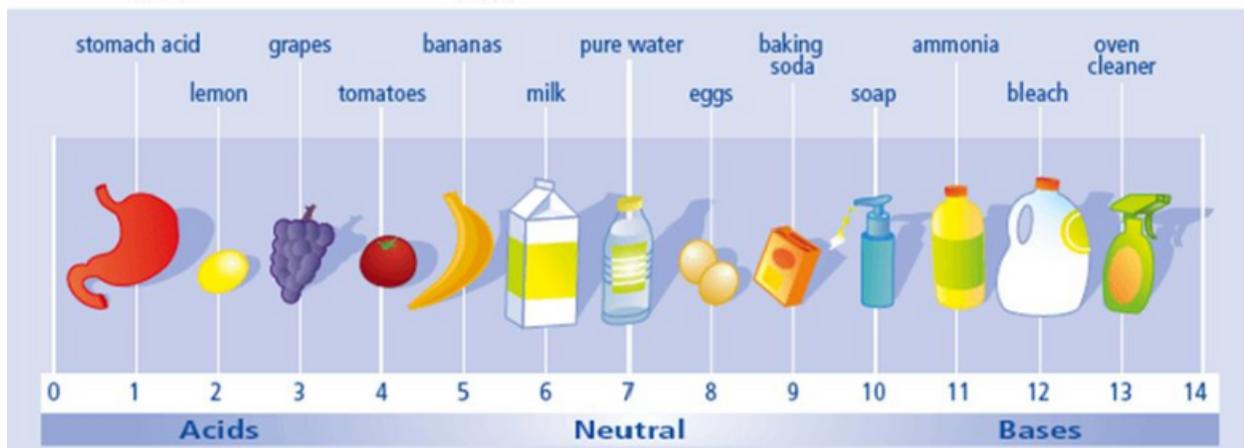




If you have left over cabbage and or cabbage water you can test the pH of other liquids. To test the pH of other liquids just do the some thing you did with your water sample.

Here's some examples of liquids you can test the pH of:

- bleach (use with caution)
- baking soda dissolved in water
- lemon juice
- vinegar
- antacids
- seltzer water
- soapy water



Thanks for exploring with us! If you would like to share your water sample results with Raccoon Creek Partnership email us at: [raccooncreekpartnership@gmail.com](mailto:raccooncreekpartnership@gmail.com).  
*See you next time!*

