**pH of water in our school and community**

**Standards and skills:**

3.1f Objects and/or materials can be sorted or classified according to their properties.

\*Constructing explanation and designing solutions -- Early in their science education, students need opportunities to engage in constructing and critiquing explanations. They should be encouraged to develop explanations of what they observe when conducting their own investigations and to evaluate their own and others’ explanations for consistency with the evidence.

**Deep Understandings**?

Students **apply** scientific thinking to understanding that objects have properties and these properties can be used to “polish” a penny. Some liquids are acidic, some are basic, and some are neutral.

Students will **conduct** an investigation, record and analyze results

Students will **reflect** on new learning and **compare** to prediction

**Materials Monica will bring: Teacher Materials**

Red Cabbage juice indicator Water sources in our school and community

Vinegar tap water \*\*

Baking Soda water from creek river, canal\*\*

Distilled water rain water \*\*

Pipettes

Petri dishes

#### \*\*Collecting the Rain Water --After your plastic containers are washed and rinsed well, place them in the open rain.  Immediately after the rain stops, pour the rainwater through filter paper and collect it in another clean plastic container.  Do not let the water sit for an extended period of time for this will alter the pH of the water.\*\*

PLE – Planned Learning Experience:

Introduction: Explain that cabbage juice is a pH indicator and what it does and demonstrate with acid and base and distillied water and show chart. Explain what we will do and have them predict what pH of different substances will be and circle in red prediction circle.

Give students 3 petri dishes, pipettes labeled for the water source, and container of cabbage water.

Fill bottom of perti dish with a sample of water, and place drops of cabbage water into each dish.

Record results in data table on yellow circle.

In green circle, write conclusion which relates their prediction to their results.

Discuss what happened and why.

**What happens if the pH of my drinking water is too low or too high?**

There are no health risks associated with consuming water that is slightly acidic or

basic. After all, we can eat lemons, drink soft drinks, and eat eggs. However,

when water has a pH that is too low, it will lead to corrosion and pitting of pipes in

plumbing and distribution systems. This can lead to health problems if metal

particles are leached into the water supply from the corroded pipes. The water

also has a slightly bitter and metallic taste that some may find objectionable. If

the pH of your water is too high, it will have a taste similar to baking soda and will

have a slippery feel to it. It will also begin to leave scale deposits on plumbing and

fixtures, which will decrease the efficiency of the plumbing systems.

**Why is rain water slightly acidic? What if it is too acidic?**

Rain will always be slightly acidic and this is important, as the weak acid dissolves minerals in the earth that are necessary for our health. This is also why rivers and streams are never "pure water', although they may be "clean".  
**Why Does It Matter?** Carbon dioxide is one of the causes of acid rain, but it is not the only contributor. Industrial plants emit large amounts of sulfur dioxide and nitrogen oxides from their smoke stacks. Like carbon dioxide, these gases undergo chemical reactions in the atmosphere, which return to the Earth's surface in the form of acid rain.

**Stop and Think:** ***Predict what will happen:***

* What do you already know about this topic?
* What is your prediction or hypothesis of what will happen or what will occur and WHY?

**Observe Carefully: *Use your senses to be aware of what is going on and record your data.***

* Observe what is happening
* Collect, record, and interpret your data (information you gather from your senses)
* Measure
* Make inferences (statement to explain the observations)
* Manipulate and/or use numbers and formula’s if necessary
* Replicate (repeat) when possible

**Go right ahead:** ***Make a conclusion based on what you know and what you have observed.***

* Interpret your data by analyzing the information you have collected and describing what occurred and why
* Identifying variables: characteristics of objects or events that stay the same (control) or change (variable)
* Compare what you thought would happened to what actually happened and explain your results
* Communicate your findings either visually or with a presentation

Make a prediction or hypothesis, aiquid will polish the penny.

**Circle your predictions in the red circle below:**

1. I predict the SCHOOL water will stay purple/ turn red/ turn blue
2. I predict the LOCAL water will stay purple/ turn red/ turn blue
3. I predict the RAIN water will stay purple/ turn red/ turn blue

**Observations:**

|  |  |
| --- | --- |
| **Water Source** | **Color it turns after we added cabbage water indicator**  **RED, PURPLE, BLUE** |
| School |  |
| Local (creek, river, or pond) |  |
| Rain |  |

1. MC900434389[1]My prediction about the SCHOOL water was:

MC900423159[1]

1. MC900434389[1]My prediction about the LOCAL water was:

MC900423159[1]

1. MC900434389[1]My prediction about the RAIN water was:

**MC900423159[1]**

**Why?**