pH of Water

Sections

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Cub Scouts
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Scouts VICTORIA

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Challenge Areas

COMMUNITY
CREATIVE
OUTDOOR
PERSONAL GROWTH

Scout Method Elements

COMMUNITY INVOLVEMENT
LEARNING BY DOING
NATURE AND THE OUTDOORS
PROMISE AND LAW
PERSONAL PROGRESSION
PATROL SYSTEM
SYMBOLIC FRAMEWORK
YOUTH LEADING, ADULTS SUPPORTING

SPICES Growth Areas

CHARACTER
EMOTIONAL
INTELLECTUAL
PHYSICAL
SOCIAL
SPIRITUAL

The Adventure

Explore the pH of water in our environment using and electrical pH meter.

Plan

1. Investigate acids and bases their properties. What acids and bases do you encounter in your everyday life?
2. Investigate the pH scale as a way to measure the strength of acids and bases. What is the pH of a weak acid, strong acid, weak base, and strong base? What is the pH of water? Discuss what might affect the pH of water?
3. Collect the materials required for the experiments and recording your results. Communicate with your patrol and leaders. You will need a set of different water samples, an electronic pH meter, some containers to hold the water.
4. Develop hypotheses regarding what the pH of the different waters will be and why.
5. Read the safety requirements and discuss with your leaders/adult supervisors what supervision and safety requirements might be needed.

Do

1. Set up the experiment and record materials and hypotheses.
2. Make sure everyone is aware of the safety rules.
3. Collect your environmental water samples, for example; lake water, tap water, bottle water, demineralised water etc.
4. Learn how to use the electrical pH reader and use the pH reader to measure the pH of the different types of water.
5. Record your results.

Review

1. Evaluate your hypotheses. Which types of water had an acidic, basic or neutral pH, why? Was this what you had predicted?
2. Is water an acid, base or neutral liquid?
3. What other household liquids or water could you test? Would these have acidic, basic or neutral pHs and what makes you think so?
4. Can you think of any examples of these reactions occurring in the real world?
5. If you were to do this activity again, what would you do the same? What would you do differently?

Safety

- Equipment warning: When working with electrical equipment make sure you follow instructions and use the equipment properly to avoid damage that may introduce hazards.
- Sharps warning: If you collect your water samples in glass there is a risk for breaks and cuts. Ensure any broken glass is handled and disposed of appropriately. Seek first-aid from leaders in the event of a cut or other injury.

Variations

- What other liquids can you use the pH meter to test?
- Try heating or cooling the water samples. How does water temperature affect the pH?
- For older sections, with supervision try making a neutral solution using household weak acids and bases? What is this process called and how does it work? Can you think of examples of this process being used in real life?
- Try testing some other methods of measuring pH such as those listed in the 'Indicators' Challenge Card
- A larger program can be build using other ‘Acid and Bases’ or chemistry challenge cards.