Change Me!
Teacher's Guide

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The Initial View (Introducing the Activity)

Students should be very careful with these chemicals, as they can cause burns. *The phenolphthalein is dissolved in alcohol, which makes it flammable!! Goggles and gloves are required for the kids to remain safe*. Using distilled water might be a good idea, since its pH is right at the neutral point so you don't have to worry about pH of your local water supply.

Take a Deeper View! (More Science)

Acids and **Bases** are important parts of our lives. An acid, for example, works to help **Digest** food in your stomach. Bases are used to make things like soaps or drain cleaners. When you added the hydrochloric acid to the sodium hydroxide you made two new chemicals by doing a **Chemical Reaction**. These were water and table salt (sodium chloride). These two substances are pretty harmless materials made from the reaction between two very dangerous chemicals! The name of the chemical reaction between an acid and a base is called **Neutralization**. A common example of a neutralization reaction is when you take an antacid (another name for a mild base) for an upset stomach. (Upset usually means too much acid!)

Here's the chemical reaction for this neutralization.

hydrochloric acid + sodium hydroxide yields sodium chloride + water

HCl + $NaOH$ yields $NaCl$ + H_2O

More and Bigger Views! (Additional Classroom Ideas)

1. Use some universal indicator paper to check the pH of several substances. Bring in and test common liquids, but make sure they're safe to handle and don't need special ventilation or special handling.
2. Find some other examples of salts, check out some reference books. (Table salt is not the only salt! **Salts** are a combination of a **Positive Ion** from an acid and a **Negative Ion** from a base.) They are commonly made when an acid and a base react together.
3. Research what other acids, bases or salts are used in industry and manufacturing.
4. Phenolphthalein is also used in medicine, find out where. Tell about these uses.
5. Observe the **Chemical Formulas** for hydrochloric acid and sodium hydroxide in the equation above.. Make a drawing of what you think the chemicals look like while the chemical reaction is happening. Just let the kids be imaginative in this one, they can't know what the **Atoms**, **Ions**, and **Molecules** actually look like, just have some fun!
6. Find out what the pH of human blood is and why keeping the pH constant is so important. Read and write about blood pH and its importance.
7. From a pharmacist find out how antacids work and some different kinds.
8. What kinds of water testing is done at the local water treatment plant? Take a field trip and find out in person how water is tested for purity and safety.
9. People are very concerned about **Acid Rain**. Find out how burning fuels cause this and how we can reduce the problem.
10. Farmers and gardeners check the pH of soil. Some plants require a certain pH. Visit a garden center or have someone test some soil samples for the pH.

Answers

1. (slightly acid) 2. (the soil became more acidic)

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