

Lesson Plan - Acids & Bases

We need to collect data to measure how effective our lesson is. Here is one way:

1. Distribute the **Knowledge Test** to all participants and emphasize to please not guess at the answers. Emphasize it's OK to mark "I Don't Know" since we are all here to learn more about this topic
2. Gather the completed tests and mark them all with a "1" to indicate they are the first set of tests
3. Go over the **Fun Facts** (see page 2) prior to the video. Mention these **Fun Facts** will also be in the video
4. Play the video and pause on the **Fun Facts** if you want to (repetition is the key to learning!)
5. Distribute the **Knowledge Test** and mark them all with a "2" to indicate they are the second set of tests

Guide to doing the experiment:

Make the Indicator Solution:

1. Cut a Red Cabbage into Quarters
2. Dice one quarter of the cabbage into ½" bits and pieces and place them in a 4-cup cooling container
3. Boil 3-½ Cups tap water (on the stove or in a microwave)
4. Pour the boiling water over the diced cabbage and let it steep until it is cool/warm (about an hour)
5. Strain the cabbage solids out of the steeped mixture so that you end up with a clear purple liquid

Get the experiment ready:

1. Gather 7 clear glasses
2. Place ½ cup of each of the Acids/Bases into the glasses: (vinegar, lemon juice, Sprite, water, baking soda, Windex, and bleach).

NOTE: You must turn the baking soda (powder) into a solution by mixing ½ cup water with ½ tablespoon baking soda.

Do the experiment:

1. Measure ½ cup Indicator Solution and pour it into the glass containing vinegar and note the reaction
2. Repeat for all 7 liquids

Supplies/Tools Needed:

7 Clear & Tall glasses
4-Cup Measuring Cup
Cutting Board
Chopping Knife
4-Cup Container

Materials Needed:

Red Cabbage
Vinegar
Lemon Juice
Sprite Soda
Water
Baking Soda
Windex
Bleach

Fun Facts Acids/Bases and pH Indicator Acids & Bases

- Acids release protons (H^+)
- Bases accept protons (H^+)
- Acids taste sour/tart, like lemons
- Bases taste bitter and feel slippery, like soap
- Strong Acids and Bases can be dangerous
- The pH Scale measures Acids and Bases

pH Indicator

- “pH” stands for *potential of hydrogen*
- pH measures the concentration of *protons* (H^+)
- pH is a *scale of acidity* from 0 to 14
- pH of 7 is called *neutral*
- A *pH indicator* is a chemical compound added so the pH of the solution can be seen

Knowledge Test: Acids & Bases

1. Acids release Protons (H^+)
 - a. True
 - b. False
 - c. I don't know
2. Bases accept Protons (H^+)
 - a. True
 - b. False
 - c. I don't know
3. Acids taste sour like a lemon.
 - a. True
 - b. False
 - c. I don't know
4. Only Acids are dangerous chemicals.
 - a. True
 - b. False
 - c. I don't know
5. The pH Scale is used to measure Acids and Bases.
 - a. True
 - b. False
 - c. I don't know

Answer Key: 1A, 2A, 3A, 4B, 5A