# Acid/Base Lesson Plan

**Teacher** **Date**
**School** **SLE #** PS.5.6.3: Conduct investigations using acid/base indicators, NS.1.6.1: Verify accuracy of observations, NS.1.6.5: Communicate results and conclusions from scientific inquiry.

**Objectives:**
**Content: I will be able to conduct investigations using acid/base indicators.**
**I will be able to verify accuracy of observations.**
**I will be able to communicate results and conclusions from scientific inquiry.**

**Language: I will use the terms conclusion, inquiry, hypothesis, variables, and sample while working with my group.**

**Assessment:** Students will be assessed based on completed data and observation sheet as well as their completed writing assignment.

**Technology/Materials:** Litmus paper OR Purple Cabbage water (used as pH indicator), different liquids (water, ammonia, soda, juice, milk, tea, energy drink, etc), small cups (1 for each type of liquid used), eye droppers or spoons, observation and data sheet, pencils, paper towels

**Vocabulary:** conclusion, inquiry, hypothesis, variables, sample

**Bloom's:** ☒ Remembering ☒ Understanding ☒ Applying ☐ Analyzing ☐ Evaluation ☒ Creating

**Questions:** What is an acid? What is a base? Give some examples of an acid. Give some examples of a base. Describe how we could test to see if a liquid is an acid or a base? Could a liquid be both an acid and a base at the same time?

**High Yield Strategies:** ☒ Identifying similarities & Differences ☒ Summarizing & Note Taking ☒ Cooperative Learning ☒ Reinforcing Effort & Providing Recognition ☒ Setting Objectives & Providing Feedback ☒ Generating & Testing Hypotheses ☒ Cues, Questions & Advanced Organizers ☒ Homework & Practice ☒ Nonlinguistic Representations

**Instructional Strategies:**

**Engagement:** Activate prior knowledge by asking questions above. Show the students the different liquids that they will be testing. Ask them to make a hypothesis about each liquid. "If I place a litmus paper into the soda, then the litmus paper will turn blue (or another color)."

[If using purple cabbage juice, then the hypothesis may say "then the soda will turn yellow (or another color)." When using the cabbage juice, the juice will turn the liquid a different color.]

**Exploration:** Allow the students some time to make observations about their liquids BEFORE placing litmus paper or cabbage juice into them. Make sure students are completing the Data/Observation sheet for each liquid. After they have completed that, they may begin testing using either pH indicator. After they dip the Litmus paper into the liquids, have students lay out to dry on paper towels. Again, make sure students are completing their Data/Observation Sheets.

Another way to do this is to give each group a different set of liquids to test. Then, later on they will share their data.

**Explanation:** Ask the students the following:
- Explain why the litmus paper changed.
- Were you surprised by some of the changes?
- Which liquid(s) fit your hypotheses?
- Which liquid(s) did not fit your hypotheses?

**Elaboration:** As an extension, you could have students test their own saliva. They could go out

of the room or into the bathroom to get a sample of their saliva to test using the Litmus paper or cabbage juice. Then, they could swish or drink one of the liquids (a FRESH sample from bottle/can) and retest their saliva to see if the liquids have changed their saliva's pH.

**Intervention Strategies: Remodel experiment as necessary, walk around the room to facilitate learning, ask Explanation Questions as you walk around the room (CALLA Method).**
**Accommodations & Modifications (IEPs) See individual IEPs or accommodations. Group students as needed.**

**Evaluation:** Have students create a chart that shows their results. The students will then share their data with the class and discuss the questions listed above in the Explanation section.

**Closure:** Have the students write about the following:
1. Were there any liquids that surprised you when the test showed they were an acid or a base? If so, which one(s)?
2. Describe how this test could be useful to someone. How would they use the results?
3. Why is it important to know about what liquids you put into your body?
4. Explain how some of the liquids might affect your body.

If the students completed the elaboration:
5. Did drinking or swishing the liquid change the pH of your saliva?
6. Explain why the liquid changed the pH of your saliva.
7. Describe how this could affect your body over time?

**Homework:** Have students find different household items to test. They could bring in an item or if there is extra litmus paper or cabbage juice, allow them to bring it home to test.