

# Lesson Plan Design



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Name    (SAMPLE)   

Date \_\_\_\_\_

Time \_\_\_\_\_ to \_\_\_\_\_

Subject    SCIENCE    Grade(s)    3-6   

Topic    ACIDS AND BASES   

Approved by Cooperating Teacher \_\_\_\_\_

## A. Objectives / Learner Outcomes (knowledge, attitudes, skills)

“At the completion of this lesson, learners will be able to...” (Remember to use observable / measurable terms + strong verbs.)

**Cognitive:** At the conclusion of this lesson, learners will identify acids and bases using a color-changing indicator.

**Affective:** At the conclusion of this lesson, learners will apply the process of identifying acids and bases with common products found in the home.

**Psycho-motor:** At the conclusion of this lesson, learners will discriminate visually tests for acids and bases.

Relevant National Science Education Standards:

Science as Inquiry — abilities necessary to do scientific inquiry

Physical Science — Properties and changes of property in matter

## B. Assessment Plan: How will you know that the learners met the objectives?

What will you be able to observe and measure? What percentage of the class will be meeting your objectives? Incorporate this plan into the Input section of the lesson.

At the conclusion of the lesson, when students are given an unknown liquid, all of them will be able to explain whether the liquid is an acid or a base after testing the solution with the indicator.

## C. Multiple Intelligences: Select one primary (p) and one secondary (s)

\_\_\_\_\_ verbal linguistic

\_\_\_\_\_ musical/rhythmic

   p    visual/spatial

   s    logical/mathematical

\_\_\_\_\_ interpersonal

\_\_\_\_\_ intrapersonal

\_\_\_\_\_ bodily/kinesthetic

\_\_\_\_\_ naturalistic

## D. Materials/Equipment needed:

(Include technology, handouts, supplies)  
red cabbage juice, baking soda solution,  
vinegar, small beakers, eye droppers,  
grid for recording observations, 3X5 cards

## E. Essential Vocabulary

indicator(s), chemicals, acids, sour, bases, bitter

## F. Accommodations for Learners who have difficulty, ELL/ESL/LEP, LD, gifted, etc.

For gifted students in my class, I will have them “research” other plant juices that could be used as indicators of acids and bases.

## G. Lesson Planning of Teaching/Learning Activities:

### 1. Anticipatory Set/Set Induction/Introduction/Focusing Event

Did you know that an **indicator** shows or points out something to you. When you smile or laugh, you show or indicate that you're happy. When our stomachs growl, what would that indicate? *That we are hungry.*

*Transition:* Today we are going to discover how certain plant chemicals indicate acids and bases by changing color.

### 2. Input: Outline of Presentation — steps/strategies/modeling (means of instruction) *For science lesson plans, indicate the learning cycle: 1) Exploration, 2) Inquiry and Acquisition, 3) Discovery and Application.*

**Prepare the following in advance:** Each student should have a chart on which they can mark predictions and observations of any color change.

Each team should have 3 beakers with the liquid in each labeled: beaker #1 baking soda, #2 vinegar, #3 red cabbage juice.

- Ask the children, "What color is the liquid in beaker #1 (baking soda)?"
- Ask the children, "What color is the liquid in beaker #2 (vinegar)?"
- Ask the children, "What color is the liquid in beaker #3 (red cabbage juice)?"
- Let's explore: "What do you think will happen when we add a drop of the liquid from beaker #3 to beaker #1?" "Will the liquid in beaker #1 change the color of the drop of liquid you placed into it?" Have the children record their prediction and have them add the liquid. "What do you observe? Record any changes that you see in the color of the liquid."
- "What do you think will happen when we add a drop of beaker #3 to beaker #2?" Have the children record their prediction and have them add the liquid. "What do you observe? Record any changes that you see in the color of the liquid."
- Explain to the children that liquids like #1 are called bases (They have a bitter taste.) and liquids like #2 are called acids (They taste sour.).
- Discovery: Ask the children, "What did the red cabbage juice indicate the liquids in beaker #1 and #2 were? *How did it indicate that one was the acid and the other was the base?*"
- We call plant juices like red cabbage juice that change color, chemical indicators. "What does that mean?" *They show or indicate that something is either an acid or a base.*

*Transition:* *Do you think there are other plant juices that we could use as indicators for acids and bases?(This further exploration begins the learning cycle again.)*

### 3. Guided Practice: At a separate learning center, students can explore further by testing such things as lemon juice and very dilute ammonia with cabbage juice or grape juice or blueberry juice.

*Transition:* *In conclusion, I want you to tell me which of the two liquids I have is either an acid or a base. Show the children the two beakers. Put drops of cabbage juice into each liquid.*

### 4. Evidence of Learning: (*How will you know when the learners have reached the objectives?*) Give each child a 3X5 card to record his/her observations. When the students are able to correctly identify which liquid is an acid and which is a base by the color change, they have reached the objective. Ask the students how they know one is an acid and the other a base. *The red is the acid. The blue is the base.*

*Transition:* *Today we are going to do a painting with indicator solution.*

### 5. Closure and Independent Practice for transfer of learning (Assignment)

Give each student a black-line copy of a picture, e.g, cabbage patch doll. They should first paint the picture with the cabbage juice solution. Then taking a Q-tip they will paint dots, lines, and crosshatches over the various objects with the baking soda solution and vinegar. When pictures have dried, place on the bulletin board with an appropriate title with words acids and bases.

## H. Evaluation/Reflection of Teaching/Learning: (By the student teacher — How did I teach? What did I learn about my teaching? What specifically do I need to work on for improvement?)