



## Basics of Chemistry

**BUILDING BLOCK FOR SUCCESS - reusable across all programs**

Applies to: Cosmetology, Barbering, Esthetics, and Nail Technology

Suggested time: 3 hours (theory and a guided pH demonstration)

**How to use this plan:** The lines under "Say" are scripted word for word so every class hears the same information - read them aloud. *Italic in brackets is what you do.* The jade "Teaching move" names the method; the "Students" line is their involvement.

### Learning Objectives

By the end of this lesson, students will be able to:

- Explain why chemistry matters to safe, effective salon services.
- Define matter, elements, compounds, and mixtures using salon examples.
- Describe the pH scale and how pH affects hair and skin.
- Handle salon products safely using the label and SDS.

### Materials and Equipment

- SGS chapter slide deck, projector, and whiteboard
- pH test strips and several sealed sample products (shampoo, conditioner, toner)
- pH scale handout and the product pH lab worksheet
- SDS binder, gloves, and the student workbook

### Key Terms

chemistry, matter, element, compound, mixture, solution, emulsion, surfactant, pH, pH scale, acid, alkaline (base), neutral, oxidation.

### Lesson Sequence

#### 1. Opening Hook - 10 min

**Teaching move:** *Lower the fear, raise the relevance.*

**SAY (read aloud):**

When I say chemistry, some of you just tensed up. Relax - you are already a chemist. Every product you will ever touch is chemistry: shampoo, conditioner, color, perm, polish, remover. You do not need to be a scientist. You need to understand just enough to use these products safely and get beautiful, consistent results. Today we make chemistry simple and useful.

- **Students:** name one salon product and guess whether it is acidic or alkaline.

#### 2. What Everything Is Made Of - 15 min

**Teaching move:** *Define the basics with salon examples.*

**SAY (read aloud):**

Everything around us is matter - anything that takes up space. Matter is built from elements, the basic ingredients. When elements combine they form compounds - water is a compound of hydrogen and oxygen.



And when things are simply blended without combining chemically, we get a mixture.

Most of your products are mixtures and solutions. A shampoo is a mixture; a conditioner is often an emulsion, which is oil and water held together by a surfactant. You do not need the deep science - you need to know your products are blends designed to do a job.

- **Students:** sort three examples into element, compound, or mixture.

### 3. The pH Scale - 20 min

*Teaching move: Tell-show-do; demonstrate with pH strips.*

**SAY (read aloud):**

Here is the single most useful idea in salon chemistry: the pH scale. *[Draw the 0 to 14 scale on the board.]* It runs from zero to fourteen. Seven is neutral, like pure water. Below seven is acidic, and above seven is alkaline. Your hair and skin are naturally a little acidic, around four-and-a-half to five-and-a-half.

Why does this matter? An alkaline product, high on the scale, swells and opens the hair's cuticle - that is how color and perms get in. An acidic product, low on the scale, smooths and closes the cuticle - that is what a conditioner does. *[Test two products with pH strips and read the results aloud.]* Watch - the shampoo and the conditioner test at different points on the scale, and now you know why.

- **Students:** predict, then test, whether a product is acidic or alkaline using a pH strip.

### 4. Acids, Alkalis, and Oxidation - 15 min

*Teaching move: Connect chemistry to real services and safety.*

**SAY (read aloud):**

Let's name the players. Acidic products close the cuticle and add shine - think conditioners and toners. Alkaline products open the cuticle - think permanent color and perms. And oxidation is a chemical reaction we use on purpose: hair color and developer rely on it to work.

The safety point is simple but serious: these are real chemicals. You never mix products the label does not tell you to mix, you always check the strength, and you respect the reaction you are starting.

- **Students:** name one acidic product and one alkaline product.

### 5. Handling Products Safely - 15 min

*Teaching move: Tie back to infection control and the SDS.*

**SAY (read aloud):**

Chemistry safety and infection control go hand in hand. Before you use any product, you read the label and the SDS for the hazards, the protective equipment, and the first aid. You wear gloves, you ensure ventilation, and you store products upright, capped, and labeled. *[Hold up the SDS binder.]* If you do not know what a product is or how to handle it, the answer is always in here. Never guess with chemistry.

- **Students:** find the handling and first-aid sections on a sample SDS.

### 6. Activity - Product pH Lab - 15 min

*Teaching move: Hands-on application.*

**SAY (read aloud):**

Now you run the lab. *[Hand out the pH lab worksheet and strips.]* In pairs, test each product, record its pH, and write whether it is acidic, neutral, or alkaline and what that means for the hair. We will compare results as a class.

- **Students:** test products, record pH, and classify each on the worksheet.

## 7. Check and Recap - 10 min

*Teaching move: Recall the key idea, then close.*

**SAY (read aloud):**

Quick check. What number is neutral on the pH scale? *[Pause.]* Seven. Does an alkaline product open or close the cuticle? *[Pause.]* It opens it. To recap: everything is chemistry, the pH scale tells you how a product behaves on hair and skin, and the label and SDS keep you safe. Master the pH scale and you will understand half of everything you do at the chair.

- **Students:** state one product they will now choose more wisely because of pH.

## Assessment

- Performance: completed product pH lab worksheet with correct classifications.
- Written: quiz on matter, the pH scale, and key terms.
- Verbal: participation in the pH demonstration and lab.

## Assignment

Read the Basics of Chemistry chapter and complete the workbook. Memorize the pH scale: where neutral, acidic, and alkaline fall, and where hair and skin sit.

## Instructor Notes and Safety

*Keep all demo products sealed or use the SDS-allowed simulation; require gloves.*

*Emphasize the pH scale - it is the highest-value concept and recurs in color, texture, and skin care.*