

The pH-D of Pollution: A Crash Course in Crisis Chemistry

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Course Title: The pH-D of Pollution: A Crash Course in Crisis Chemistry

Duration: 1 hour, 50 minutes (110 minutes total)

Category: Science

Style: Activity-Style Class

Maximum Enrollment: 20 students (Ideal enrollment in multiples of 4 for group activity)

Course Description

The challenge is clear: industrial waste is polluting rivers globally with persistent, toxic dyes. In this intensive **1-hour and 50-minute, hands-on workshop**, you'll analyze cutting-edge water purification research, including Advanced Oxidation Processes (Fenton) and Nanotechnology (Graphene Oxide) that achieves over 90% pollutant removal. Your mission: choose the most viable cleanup technology and, working in teams, develop a comprehensive implementation plan and pitch for a water-stressed community. It's a race against pollution to design a sustainable, global solution.

1:50 (110-Minute) Class Schedule

Time	Duration	Activity	Description	Learning Objective
0:00 - 0:05	5 min	Introduction & Crisis Setup	Goal: Hook the students. Present the global problem of textile dye pollution (using the case study of polluted rivers) and the urgent need for sustainable cleanup.	Establish the real-world scale and urgency of the environmental challenge.
0:05 - 0:40	35 min	Lecture: Crisis Chemical Solutions (Exposing the Material)	Core Content Exposure: Analyze advanced solutions: POA/Fenton (pH critical), Electrocoagulation , and Graphene Oxide . Focus on key chemical concepts, comparative efficacy, and purification results. This is the main content hour.	Understand the scientific principles, comparative efficacy, and limitations of 3 different advanced water treatment technologies.

0:40 - 0:50	10 min	Transition & Global Task Explanation/ Q&A	Introduce the comprehensive design challenge clearly, distribute materials, and answer clarifying questions before students break into groups. Task: Select community, plan pitch (cost/practice/efficacy), and display on cardboard. The pitch guideline will be provided.	Translate abstract scientific data into a concrete, market-ready, and socially-aware solution plan.
0:50 - 1:30	40 min	Group Design Challenge (Hands-On)	Students work in groups of 4 to select their optimal technology/community and create their implementation pitch/visual display on the cardboard/poster board . Open internet access is allowed for research.	Develop critical thinking, resource management skills, teamwork, and visual communication.
1:30 - 1:50	20 min	Group Pitches & Final Vote	Each of the 5 groups delivers a 3-minute pitch (5 groups×3 min=15 min). The pitch must summarize their proposed method, community, and plan. A quick poll follows to vote for the favorite idea (excluding their own).	Practice persuasive communication, defend project feasibility, and engage in constructive peer evaluation.