Log book

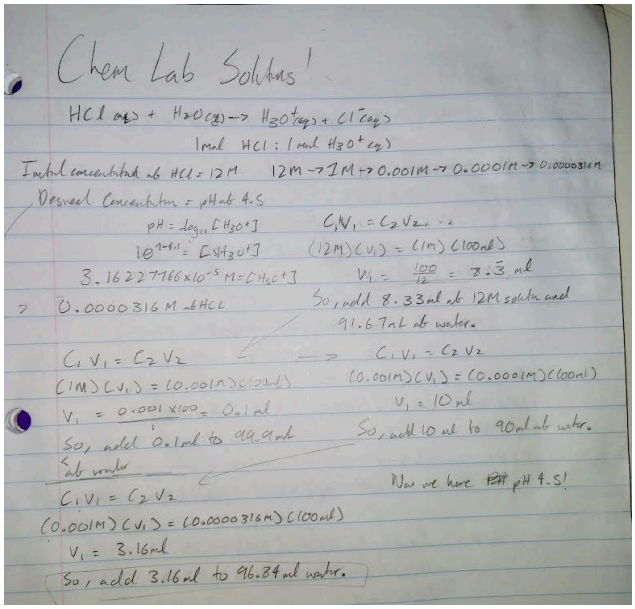
Jan 10–20 – Conducted background research on wound pH ranges and infection indicators. Gathered information to inform experimental design and selection of pH-sensitive pigments.

Research done:
The pH on an acute infected wound will turn from slightly basic to slightly acidic due to the presence of bacteria that produce alkaline byproducts like ammonia, raising the pH levels. This pH shift to more basic helps the bacteria grow more easily and can slow the body's natural repair process.
Turnips and red cabbage both contain natural pigments called anthocyanins that act as pH indicators.
Red cabbage will turn blue/green as the pH levels get higher.
The best way to make turnip extract is to juice it.
The best way to make cabbage extract is to boil it in either distilled or tap water (distilled is preferred as tap contains minerals)

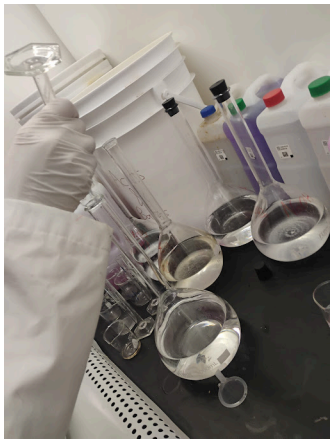
Jan 21 – Purchased and juiced turnips for initial testing.

Jan 22 – Encountered difficulties determining accurate pH values using turnip extract. Discovered that purple cabbage also exhibits pH-sensitive color changes. Decided to switch to purple cabbage and resume the experiment on Monday/Tuesday.

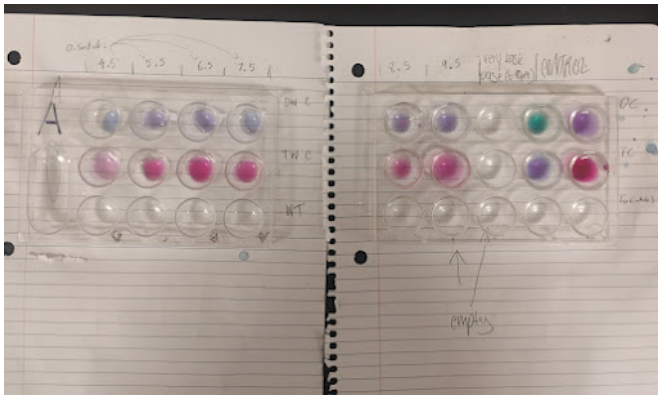
Jan 23 – Performed calculations to prepare diluted HCl solutions to create acidic pH solutions ranging from 4.5 to 9.5. Planned a total of six solutions with 1 pH unit increments between each.



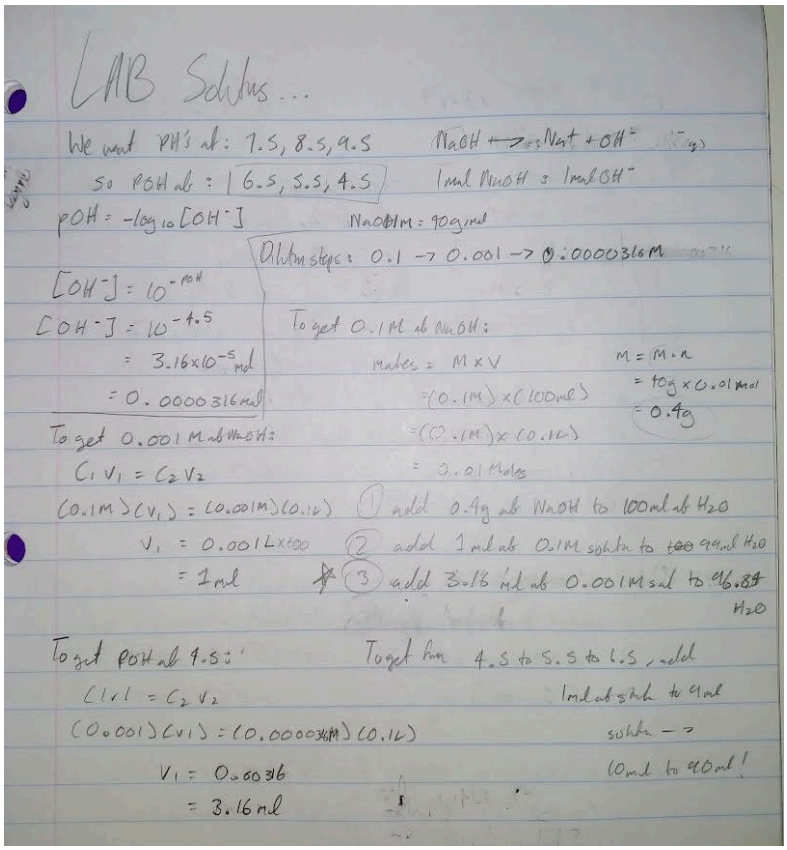
Jan 26 – Prepared new pH solutions and extracted pigments from purple cabbage for testing.



Feb 5 – Tested initial pH solutions. Results were not accurate, but confirmed that cabbage extract functions as a pH indicator. Observed that the cabbage solution changes color even when mixed with tap water (pH ~7–7.5), confirming its sensitivity.



Feb 10 – Realized that dilute HCl solutions could not create basic solutions because hydronium ions would always exceed hydroxide ions. Calculated and prepared dilute NaOH solutions instead to achieve controlled basic pH levels. Adjusted the experimental range to pH 7.5, 8.5, and 9.5 (instead of 4.5–9.5) to better reflect infected wound conditions.



Feb 25-26 – Remade pH solutions using NaOH to create a stronger base. The solutions produced consistent and observable color changes when combined with cabbage extract.

Mar 1 – Began testing pH-responsive cabbage extract with cotton gauze soaked in the solution. Observing and recording color changes to evaluate the feasibility of using dyed gauze as a pH-sensitive wound dressing.

Mar 3 – Completed testing of pH-responsive cabbage extract with cotton gauze soaked in the solution. Successfully finished the experiment and analyzed the results to evaluate the feasibility of using dyed gauze as a pH-sensitive wound dressing.