

# Lab Report Template

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Project 4.2.3 Soil Buffers

## Problem

This experiment will determine what soil texture has the highest buffering capacity.

## Hypothesis

Clay will have the highest buffering capacity compared to sand and loam.

## Materials

- 3 9-oz Plastic cups
- Distilled water
- 2 250ml beaker
- Permanent marker
- Laboratory tape
- 3 plastic spoons
- LabQuest2
- Vernier pH sensor
- Buffer solution
- Stir rod
- HCL
- NaOH
- Clay soil
- Sandy soil
- Loam soil

## Procedures

1. Use marker and laboratory tape to label one cup “sand”, a second “silt”, and a third “clay”
2. Place four spoonful's of sand into your cup labeled sand.
3. Repeat this process for silt and clay.
4. For each sample measure 100ml of distilled water and add the water to each cup
5. Stir each sample with a stir rod for two minutes
6. As the samples settle, develop your own procedure for testing the buffering capabilities of each soil solution. Note: Samples should settle for 2 – 3 minutes before measuring pH with pH sensor.
7. Record your procedure and materials on the lab plan.
8. Develop a data table for organizing your data.

## Data Collection

Soil	Added	0 Drops	5 Drops	10 Drops	15 Drops	20 Drops	25 Drops	ΔpH
Loam	Base	5.27	6.65	6.70	7.31	7.46	7.47	+2.10
Sand	Acid	6.03	4.63	4.49	4.36	4.29	4.21	-1.82
Clay	Acid	5.92	5.27	5.25	5.25	5.19	5.17	-0.75

## Analysis of Results

The results of the experiment showed that clay changed by .75, sand changed by 1.82, and loam changed by 2.10.

## Conclusions

With the results of the experiment I can infer that the buffering capacity is determined by the soil texture. This experiment proved my hypothesis by having clay have the highest buffering capacity compared to loam and sand. I made a mistake by putting in a base for loam and using acid for sand and clay. I wonder what the buffering capacity of gravel is.