SCIENCE FAIR LOGBOOK

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Project Title: ***The Science of pH: From Molecules to Everyday Life***

Category: Chemistry

School Year: 2025–2026

Brainstorming Ideas:

- Natural Vs Chemical cleaners
- Natural vs Artificial pH testers
- Making Biodegradable plastic
- Plant growth under different soils

Research: [Dec 22, 2025]

I researched on my project. I found ways to make natural pH strips. I studied important topics in pH like:

- What pH stands for?
- Where can we use pH in real life?
- What are acids and bases?
- How can we measure pH?
- Who discovered pH?
- What affects the pH readings?
- What is a pH scale and what does it represent?

Hypothesis and Variables   [Dec 24, 2025]

Hypothesis: Natural pH testers won't be the best but are eco friendly and safe to teach young children pH. Artificial pH strips will be accurate but are expensive. Substances like lemon and vineger will have less pH. Whereas substances like bleach and baking soda will have more pH.

Variables:

Independent Variables:

- Types of natural pH strips I use

Dependent Variables:

- Color change of strips
- Classifying if the substance is acidic, neutral or basic

Controlled Variables:

- Same paper for making natural pH strips
- Same temperature of the indicator

Materials [Dec 30, 2025]

- Blueberries, beetroot, spinach, turmeric, tea, coffee
- Coffee filter paper, Artificial pH strips
- Vinegar, lemon juice, water, baking soda solution, coffee, tea
- Scissors, bowls, spoons, plate

Writing script [from Jan 3, 2026]

- I started writing script for my video today

Changes in script and plan [Jan 9, 2026]

Preparation [Jan 10, 2026]

- Blueberry: Crushed with little water
- Beetroot: Crushed with little water
- Spinach: Crushed with little water
- Turmeric: mixed with warm water
- Tea & Coffee: brewed

Testing the strips and recording video   [Jan 10, 2026]

I tested each strip and wrote my observations for artificial and natural pH strips.

Data recording [Jan 10, 2026]

I recorded the data on the portal in the table format. I recorded the color change and classified which tester was a better choice.

Analysis [Jan 16, 2026]

- I analyzed the data and found out:
- Blueberry strips showed widest color ranges as it has the pigment anthocyanins showing the color in all three categories
- Beetroot has the pigment betalains that reacts with more acidic substances.
- Turmeric has the pigment curcumin that reacts mostly with bases
- Spinach has chlorophyll which mostly reacted to bases

Comparing artificial and natural pH testers [Jan 17,2026]

Artificial pH testers showed accurate results. Natural tester helped me to only classify if the substance is acidic, neutral or basic.
In the natural pH testers blueberry strip showed the best result showing various color schemes making it the best natural pH tester among my other strips.

Analyzing and Drawing Conclusion   [Jan 23, 2026]

I analyzed the data and found that the pigments in different natural testers affected the accuracy of the result. I concluded by stating which is the best choice and in what way.

Source of Error and Citations   [Jan 24, 2026]

I analyzed the possible errors that I can’t fix or would have fixed. I referred to different sources and websites and noted them.

Application   [Jan 30, 2026]

I filled out the information analyzing how I can use natural and artificial pH testers in real world

Presentation and Acknowledgement   [Feb 20, 2026]

I uploaded my video on the portal and finished the credits section. I finished the whole project and was only left with the trifold.

Trifold and Preparation

I am still preparing the trifold and am making some changes. I am done with the project and practicing my presentation.