Xavier Carrion
Capstone
Ms. Gade
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Annotated Bibliography

Klane, Jonathan. "Lab Safety Rules and Guidelines." Lab Manager, https://www.labmanager.com/science-lab-safety-rules-guidelines-5727.

This article provides a lot of information on safety protocols and managing risks in a lab environment. Some things that were highlighted throughout the article are appropriate protective equipment, proper use of materials, and maintaining clean spaces. This content is especially helpful for me because I'm going to create lab safety rules for the students to ensure everyone is safe. Especially in an elementary classroom setting with young students, these guidelines will help students stay on task with hands-on lab experiments safely and responsibly. I also think the author's emphasis on preparation and vigilance is crucial for fostering a fun learning environment.

Helmenstine, Anne Marie. "The Science of How Slime Works." ThoughtCo, 3 November 2019, https://www.thoughtco.com/slime-science-how-it-works-608232.

"How Does Slime Work?- Science Explainer | STEAMWORKS." steamworks, https://www.steamworks.org.uk/how-does-slime-work/.

These sources focus on the chemistry behind how slime is created, including polymers, cross-linking, and the interaction between ingredients like glue and borax. Helmenstine provides many in-depth explanations of the molecule processes involved, breaking them down into simpler terms. The Helmenstine article and the STEAMWORKS article complement each other by focusing on how slime can engage children in science through hands-on learning. Both of these articles show how simple, interactive experiments can demonstrate complex scientific concepts, making them ideal for introducing young learners to fundamental chemistry ideas.

Both of these articles are specially used for a first science lesson for elementary students to introduce the concepts of states of matter, viscosity, and non-Newtonian fluids. By combining different substances, they can observe how slime behaves differently compared to everyday

solid and liquid substances. Also, after the lab students can observe the different properties of slime, like the stretchiness, squishiness, and resistance, and compare it to traditional states of matter. Students can also hypothesize how adding or changing slime ingredients can alter the properties of the slime, which fosters critical thinking and curiosity. The lesson can also demonstrate polymers, which could be simplified as links or paper clips to visualize chemical structures.

"Oobleck." Science World, https://www.scienceworld.ca/resource/oobleck/.

This source talks about oobleck, a non-Newtonian fluid made by mixing cornstarch and water. This article would be good after demonstrating my slime lesson because both slime and oobleck cover the same topics, such as non-Newtonian fluids and Newton's law of viscosity. This article explains how oobleck reacts differently to different amounts of pressure and demonstrates the principles of viscosity, showing the transition between the solid and liquid-like states. Another helpful thing is that it shows instructions on how to make the oobleck.

This article is perfect for a second lesson that teaches elementary students complex science concepts through simple experiments. By experimenting with oobleck, students can see how it behaves under different types of pressure, introducing them to another non-Newtonian fluid. This hands-on lab encourages curiosity and critical thinking while connecting science concepts to everyday materials.

Living Organism: Videos, Introduction, Components, Interaction, Questions, https://www.toppr.com/guides/science/the-living-organisms-and-their-surroundings/living-organism/.

"living things - Students." Britannica Kids, https://kids.britannica.com/students/article/living-things/275509.

Both of these sources provide characteristics and components of living things. The Toppr article demonstrates key traits of living things such as growth, reproduction, respiration, and responding to stimuli, while also offering videos and questions to reinforce learning. Similarly, Britannica Kids provides clear definitions and explanations of living organisms, making it easier for young learners to understand.

I planned to use these resources to create a lesson plan and a lab for an introduction to living things. I want to ask the class the simple question, " What makes something alive?" to see what they think. Then, I will use visuals from the websites to show all the key traits of a living thing. It might also be helpful for students to compare living and nonliving things to foster more understanding.

After the mini introduction, I want to involve the students in an activity to solidify their understanding. I could put them in groups and then find worksheets online to help them understand what is living and nonliving. Then I want to start to centralize this topic toward plants, demonstrating how they grow, reproduce, and interact with their environment.

Finally, the lesson will finish with a hands-on lab experiment where I'll give them a flower seed to plant in a small cup. Then I'll tie this back to the lesson they've been learning about living organisms, and how they need sunlight, soil, water, and air to grow. Over time, the students can observe their plants to understand the life processes of living things. These resources of the planting lab make learning interactive, fostering curiosity and a deeper understanding of living organisms.

Harris, Tom, and Nicholas Gerbis. "How Volcanoes Work | HowStuffWorks." Science | HowStuffWorks, https://science.howstuffworks.com/nature/natural-disasters/volcano.htm.

Osterloff, Emily. "How to make a volcano." Natural History Museum, https://www.nhm.ac.uk/discover/how-to-make-a-volcano.html.

The HowStuffWorks article demonstrates the science behind volcanoes, including their structure, how they form, and the processes that lead to eruption. It provides detailed information about the different types of volcanoes and their impact on the environment. The Natural History Museum article complements this by offering a step-by-step guide to creating a volcano model, making it a practical source of information for engaging students in hands-on learning. Together, these resources provide a comprehensive foundation for teaching elementary students about volcanoes.

To teach elementary students about volcanoes, I want to open it with a short video introducing what volcanoes are and how they function, leading up to a class discussion about what they got from the video. This conversation would consist of their parts and why they erupt. Then I would

use HowStuffWorks to explain how volcanoes work in simple terms while also explaining lava flows, and tectonic plates, to simplify details to suit younger learners. To make it more engaging and interesting, I will talk about famous volcanoes and give information about them.

Following the intro, I want to have them label a volcano based on what they learned about the parts. I would also encourage students to ask questions and ask for help if they need it so they could have a better understanding of the world around them.

I would end the lab with a hands-on activity where students would create their volcanos. I would provide them with things like clay, a plastic bottle, food coloring, and a guide for students to erupt their volcanos. As the "eruption occurs I'll explain how this experiment mimics real volcano activity, helping them visualize pressure build-up and magma release.

"Make Ice Cream | STEM Activity." Science Buddies, https://www.sciencebuddies.org/stem-activities/ice-cream-bag.

"How to Make Ice Cream in a Bag Using Science – Thoughtfully Sustainable." Thoughtfully Sustainable, https://thoughtfullysustainable.com/ice-cream-in-a-bag/.

Both resources provide a step-by-step guide for making ice cream in a bag which is a fun way to learn about states of matter, freezing point, and heat transfer. Science Buddies mostly focuses on the STEM aspect of the experiment, showcasing how salt lowers the freezing point of ice to solidify the ice cream from liquid to solid. Thoroughly Sustainable demonstrates the actual procedure, explaining the materials and the steps on how to experiment.

I thought that since this was my last experiment in chemistry, it would be a fun experiment to do with my students! I would begin my lesson by explaining heat transfer and how it works, and then I'd demonstrate how ice lowers the freezing point of ice, causing it to melt at a lower temperature. Then I'd compare these things to real-life scenarios to create ice cream and icing roads when it snows.

As demonstrated, I would provide milk, half and half, vanilla, and sugar for them to put into baggies and shake to create ice cream (this is the procedure that I did for Ms. Sessa's class so I'm gonna go with this route instead of the one demonstrated on the website). I'd also encourage them

to notice the changes occurring as they shake the bag like the ice melting, the temperature getting colder, the ice cream starting to solidify, and others. I would also ask to discuss based on the lesson earlier.

Afterward, they could eat the ice cream and enjoy the fun experiment that will hopefully stay in their memories for as long as they study science so they can look back and remember what they learned about these topics related to ice cream.