Lesson Plan Template
Date: 10/5/18
Melissa Mehlhoff

Grade: 5th Grade

Subject: Science

Materials:

- Small paper cups
- Scissors
- Glue
- Baking soda
- Water
- Grape juice
- Cotton swabs
- Pencils
- Plastic spoon
- Paper towels
- White copy paper
- Colored Construction Paper

Technology Needed: N/A

Instructional Strategies:

- ☐ Direct instruction
- ☐ Guided practice
- ☐ Socratic Seminar
- ☐ Learning Centers
- ☐ Lecture
- ☐ Technology integration
- ☐ Other (list)
- ☐ Peer teaching/collaboration/ cooperative learning
- ☐ Visuals/Graphic organizers
- ☐ PBL
- ☐ Discussion/Debate
- ☐ Modeling

Guided Practices and Concrete Application:

- ☐ Large group activity
- ☐ Independent activity
- ☐ Pairing/collaboration
- ☐ Simulations/Scenarios
- ☐ Other (list)
- ☐ Hands-on
- ☐ Technology integration
- ☐ Imitation/Repeat/Mimic

Explain:

Standard(s)

- 5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Objective(s)

By the end of the lesson, students will take part in an experiment to create invisible ink.

Bloom's Taxonomy Cognitive Level: IV. Analyzing

Differentiation

Below Proficiency: Students will complete the experiment with the assistance of a paraprofessional.

Above Proficiency: The student will explore the history of secret messages during the Revolutionary War.

Approaching/Emerging Proficiency: Students will complete the experiment independently.

Modalities/Learning Preferences:

- Visual: Students will have the lab worksheet to reference.
- Auditory: Students will listen to the teacher's directions.
- Kinesthetic: Students will use their hands to conduct an experiment.
- Textile: The students will be using various ingredients to create the invisible ink.

Classroom Management- (grouping(s), movement/transitions, etc.)

- Students will be respectful to their classmates and their teacher.
- Students will raise their hand when they want to speak.
- Students will use their walking feet in the classroom.
- Students will speak at a level 2 voice unless otherwise specified.
- Students will use their school materials in a responsible manner.

Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules, and expectations, etc.)

- Students will listen to the teacher's directions for the experiment.
- Students will be cautious when using the supplies for the experiment.
- Students will listen for the teacher to instruct the students to gather supplies.
- Students will not mix ingredients unless instructed.
- Students will clean up their work area.
- Students will not put anything in their mouth during the experiment.

Minutes	Procedures
	Set-up/Prep: • The teacher will have supplies set out and organized for the class. • The teacher will have the lab worksheet printed out.

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5	**Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)** • "Raise your hand if you wish you could make your writing invisible so that no one could decode your writing. Discuss with a partner if you think this is possible and how it could be done." • The teacher will give the students thirty seconds to discuss their opinion with their partners. • "Who would like to share their response?" The teacher will listen to a few students share their ideas. • "Today, we are going to determine whether it is possible to create invisible ink."
10	**Explain: (concepts, procedures, vocabulary, etc.)** • The teacher will hand out the lab paper to each student. • "The first step in the Scientific Process is to ask a question. Looking at our lab paper, who can tell me what the question of our experiment is?" The teacher will listen for the correct response. • "Very good, the question of our experiment is, "Will invisible ink work to hide secret messages?" • "Now, I want you to make a hypothesis whether you believe we will successfully make invisible ink. Write it down on the speculation section of the lab paper." The teacher will give students a minute to write their hypothesis." • "Now, I want you to listen to the directions for this lab carefully, so I don't have to repeat myself." • "First, you need to find a partner, and one of you needs to pick up the supplies for the experiment." • "Second, you each need to think of a word that represents the American Revolution because that word is going to be your secret message." • "Third, one of you is going to add water to the baking soda and take turns stirring the mixture. • "Fourth, you will dip one of your cotton swabs into the baking soda mixture and write a secret word on a piece of white paper. The word needs to represent the American Revolution. You will probably need to dip the swab several times while writing your secret message." • "Fifth, let the invisible ink dry completely. Watch what happens." • "Sixth, dip the other cotton swab into grape juice and "paint" over the hidden word. Observe what happens." • "Seventh, record what you saw on the observation portion of the lab paper." • Eighth, write a conclusion that answers the question we asked at the beginning of the lab and write whether your hypothesis was correct. Talk about your conclusion with your partner." • "Read your partner's word."
25	**Explore: (independent, concreate practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)** • The teacher will observe the students conduct the experiment and answer any questions they may have during the experiment. • When students have completed the experiment, the teacher will instruct students to cut out their secret message and paste it on a piece of construction paper. • Students will be instructed to clean up their workstation when they have completed the experiment.
5	**Review (wrap up and transition to next activity):** • The teacher will gather the students in a large group to discuss the experiment. • "Who would like to share their hypothesis or speculation of the invisible ink experiment?" The teacher will listen to the responses of a few students. • "Who would like to share their observation after you wrote your secret message and after you decoded the message?" The teacher will listen to a few students' responses. • "Who would like to share their conclusions about the experiment? Did the experiment work?" The teacher will listen to a few students share their response. • "Why do you think invisible ink would be useful to Patriots fighting in the Revolutionary War?" The teacher will listen to a few students' responses. • "Great work today, students. I will gather your lab worksheets and secret messages, and you may go to your next class."

Formative Assessment: (linked to objectives, during learning)
• **Progress monitoring throughout lesson (how can you document your student's learning?)**
  • The teacher will ask the students questions when they are conducting the experiment to monitor learning.
  • The teacher will listen to the responses that students provide for questions.
	Summative Assessment (linked back to objectives, END of learning)
	• The students will hand in their lab worksheet for the teacher to assess learning.
	• The students will conduct an interview with the teacher and share their learning from the American Revolution Pocket Book.

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Reflection (What went well? What did the students learn? How do you know? What changes would you make?):

I believe my science lesson went well for both classes. I taught the lesson to the two groups of fifth graders at Cathedral. The students were intrigued with the question where I asked students whether they thought it would be possible to create invisible ink. I had students share with a partner whether they believed it was possible and how they could possibly create invisible ink. After introducing the purpose of the experiment, I had students determine the question of the experiment. I believe I followed the scientific method well when I taught the lesson. I went over all the different steps and explained the different steps. The students were a little confused with wording on the worksheet as it stated speculation instead of hypothesis, but I explained hypothesis is like speculation. Before the students gathered their supplies, I had students write their hypothesis whether they believed we would be able to create invisible ink by mixing water and baking soda.

Then, I had students gather their supplies for the experiment. I think it was a good idea to take the experiment step by step, so the students were all on the same page, and I didn't have to repeat directions. I did have a few students who were not listening to directions and mixed the baking soda with the dark juice, but I just had students get new ingredients. Then, I explained the next step to students that they needed to mix the baking soda and water. The cups were a little small that I used, so we had to clean up a little from the liquid spilling. If I were to teach the lesson again, I would have a discussion on mixtures. I think students would have benefited from going more in-depth on the scientific background of mixtures.

When the students created their mixture, they were instructed to write a message using the mixture that related to the American Revolution. The first time the students didn't listen to the instructions, so I emphasized to the second group that their message had to relate to the Revolutionary War. When the students began writing their message, I noticed the paper was going to need to dry. So, I mentioned to students they should try to fan the paper or blow on their paper. I think the experiment required the paper to dry completely, but since we didn't have enough time to wait for the paper to dry, we continued with the experiment. The next part of the experiment was a little disheartening because the dark juice didn't really

result in the mixture being visible. The students were a little upset the mixture didn't result in the desired outcome, but I reminded students that Science is about trial and error. I made sure students recorded their observations and conclusion on their lab worksheet. After the students recorded, we cleaned up the experiment. The class and I had great discussions about whether our hypothesis was correct. When the students stated the experiment didn't really work, we discussed some alternate solutions that we could test such as allowing for a longer drying time, using thicker paper, and creating a new mixture.