Science Lesson Plan Reflection

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Science Lesson Plan

Teacher Candidate Name: Amy Rawlings

1. Lesson Plan Information

Subject/Course: Science - Solids and Liquids

Grade Level: 1/2 **Date:** January 18, 2021

Time: 1:35-2:15 **Topic:** Properties of Solids and Liquids

Length of Period: 60 Minutes

2. Expectation(s)
Expectation(s) (Directly from The Ontario Curriculum):

UNDERSTANDING MATTER AND ENERGY PROPERTIES OF LIQUIDS AND SOLIDS

Grade 2 Big Idea: Materials that exist as liquids and solids have specific properties

Grade 2 Overall Expectations
2. investigate the properties of and interactions among liquids and solids

3. demonstrate an understanding of the properties of liquids and solids.

Grade 2 Specific Expectations

2.2 investigate the properties of liquids (e.g., conduct experiments to compare the rate at which different liquids flow) and solids (e.g., conduct experiments to find out ways in which solids can be changed)

3.2 describe the properties of solids (e.g., they maintain their shape and cannot be poured) and liquids (e.g., they take the shape of the container they are in and can be poured)

3.4 identify conditions in which the states of liquids and solids remain constant

3. Content

What do I want the learners to know and/or be able to do?
<u>By the end of this lesson:</u>

By the end of this lesson, Grade 2 students will be able to identify and describe properties of liquids and solids. Grade 2s will identify conditions in which the states of liquids and solids remain constant or change (liquids melt above 0 degrees and freeze below 0 degrees)

Resources/Materials
Power point, iPad/lesson plan, worksheets, ice, Ziplock bags, sticky notes, ice

Learning Skills:

Independent work – Students will be required to follow instructions to complete the worksheets

Organization – Students will develop a plan for completing their tasks. They will manage their time to complete the task. Students will gather information from the lesson and use this information to complete their independent work tasks.

Responsibility – Students will complete and submit their worksheets. Students will take responsibility for and manage their own behaviour during the lesson and during independent work.

4. Assessment/Evaluation

- I will collect the student's worksheets in their folder to assess understanding
- I will follow up with students who did not demonstrate an understanding in their work
- I will document this work and make notes on student progress
- I will assess students understanding during discussion, interactive activities, and the experiment (assessment for learning- where students currently are and where we need to go)

6. Learning Context

What prior experiences, knowledge and skills do the learners bring with them to this lesson?

- Students have been introduced to solids and liquids
- Students have begun to identify their properties (if they can change shape and form or not)

How will I differentiate instruction to ensure the inclusion of all learners?

- I will support students by walking around and being available to provide further instruction to students who are struggling

7. Teaching/Learning Strategies

INTRODUCTION:

Minds On

- Read the "Freezing and Melting" page from the book "Change it"
- Play the "Melting and Freezing" BBC Bitesize video from YouTube which shows ice and water freezing and melting in warm and cold temperatures
- This will get students to begin thinking about things in their environment which freeze and melt, and under what conditions

MIDDLE:

Shared & Guided Practice

- In order to ensure shared and guided learning, collaboratively complete an interactive fill in the blanks sheet on the smartboard with the students

- Students will be invited to take turns coming up to the smart board and fill in the blanks from a word box
- The sheet will have students identify what happens when liquids freeze and when solids melt
- Next pull up a page on only liquids which shows hot chocolate – asks about its shape, feeling, and what happens when it is below 0 degrees
- Next pull up a page on only on solids which shows an ice cube – asks about its shape, feeling, and what happens when it is above 0 degrees

APPLICATION:

Experiment Predictions

- Share with students that we will be doing an experiment where we will put ice in a Ziplock bag, and tape it to the window
- Ask students to make a prediction - what do they think will happen? (students will share that it will melt) Ask students how long they think it will take to melt? Why? How?
- Ask students to record their predictions on a piece of paper

Experiment

- Provide students with a Ziplock bag and a sticky note
- Invite students to go outside and put some snow inside their Ziplock bag
- Return to the classroom, and ask students to write the time on a sticky note to place on their Ziplock bag – this will help them determine how long it takes the ice to melt
- Invite students to tape their bag of ice to the classroom window

CONSOLIDATION/CONCLUSION: *5 Mins*

- Move on to the next lesson/recess etc.
- Once the teacher/students observe that the ice in the bag has melted, bring the students attention back to science
- Ask students what they observed happened?
- Ask students how long it took for the ice to melt?
- Ask students why they think the ice melted?
- Ask students what the energy source was for the ice to melt (connecting to what they learned about energy from the sun in gr. 1 last year)
- Discuss with students that it will melt from a solid and become a liquid – it would have been below 0 degrees when the snow was outside, but now in the bag at the window it will warm above 0 degrees from the sun’s energy/warmth

Lesson Reflection

The lesson presented in this reflection was created for the purpose of my teaching placement in grade two. Prior to this lesson, students had been introduced to solids and liquids, and had begun to identify their properties. By the end of this lesson, students were to be able to identify under what conditions the states of liquids and solids remain constant or change. In this reflection, I will first discuss the successes and appropriateness of this activity for Primary aged children. A critique and consideration of areas for improvement in the future will follow.

When applied to the grade two classroom, this science lesson presented on solids and liquids was successful. This activity was successful and effective for primary aged students as I focused on concrete experimentation. This decision aligns with Piaget's cognitive development theory, which outlines the series of stages which people move through as they develop (Pedretti et al., 2015, p. 255). In grade two the child has not reached the ability to engage in abstract thinking, but rather, the students learn about classification in general ways, using and observing important characteristics – in this case scientific experimentation (Pedretti et al., 2015, p.256). Further, when students learn through hands on experiences, they are more likely to retain and recall information (Stolz, 2014, p. 474). Stolz suggests hands on embodiment is a key element in the process of understanding and explaining what is meaningful (2014). Through this, learners gain an understanding of both themselves and the world around them (Stolz, 2014).

Constructivist Lee Vygotsky found that the adult is crucial to the learning of the child (Bliss, Askew, & Macrae, 1996, p. 37). Vygotsky's thinking was the child learns best within the Zone of Proximal Development. To facilitate learning within this zone, the adult or teacher must scaffold learning (Bliss, Askew, & Macrae, 1996, p. 37). Scaffolding occurs when the teacher or the expert helps the student who is unable to carry out a task independently (Bliss, Askew, & Macrae, 1996, p. 38). The lesson presented supported students' movement through the zone of proximal development as I scaffolded student learning. I began the lesson by visually modelling and introducing the properties of solids and liquids and how they might change under certain conditions with a book and a video example. This was followed by shared and guided practice, as I collaboratively supported students in answering questions and investigating properties of solids and liquids. Each student received support appropriate to their needs when they took turns coming up to the smart board to provide an answer. I concluded the lesson by providing the students an opportunity to independently explore the properties of solids and liquids, as they had been prior equipped with the knowledge necessary to do so. The success of the scaffolding applied to my lesson was evident when reviewing student work following the lesson and at the end of the unit.

Although successful, this lesson has significant room for improvement. The first component of the lesson I will critique is the scientific method for experimentation. When creating this lesson plan, I did not carefully plan for the experiment to follow a specific scientific method, which meant students did not learn to follow a proper procedure. I believe that following the predict, observe, explain (POE) method, a strategy to explore children's ideas through experiential learning, would have been most appropriate, and simple enough for grade two students to grasp (Pedretti et al., 2015, p. 161). Moreover, when teaching in the future, I would consider how I can implement more effective questioning throughout the experiment. When teaching the lesson, students got distracted as they carried out the experiment and did not necessarily focus on what they were learning when getting ice, preparing the bags, and taping. In the future, I would re-consider how I set up my questioning throughout my lesson to ensure I follow Blooms Taxonomy, starting with recall to enhance student learning (Pedretti et al., 2015, p. 116). In this lesson, I did not ask students to reflect on their learning, but rather, I informed them about what they were seeing during the experiment, making this more of a teacher centered lesson. In the future, I could instead ask students to draw a picture of what they saw to facilitate further learning (Pedretti et al., 2015, p. 116). This would have enabled me as the teacher to gain better insight into student understanding and to facilitate more effective learning (Pedretti et al., 2015, p. 116).

Further, I believe this lesson would have been more effective if the experiments had occurred in partners, as students would have had the opportunity to collaborate and learn with one another. This would have allowed me to implement strategies to extend student thinking such as a think-pair-share activity (Pedretti et al., 2015, p. 117). This strategy would allow students to process, organize, and retain their thoughts and ideas (Pedretti et al., 2015, p. 302). As well, this strategy would ensure students have sufficient time to produce a response, rather than the group discussions presented in the lesson (Pedretti et al., 2015, p. 302). Another area which could have been improved was the lesson introduction. In this lesson, the minds on activity involved reading a book and watching a video. At the time, this was the most appropriate due to social distancing restrictions. In the future, I would modify this lesson to involve an interactive, embodied, and engaging minds on activity. For example, in groups, students could create physical movements which represent what they think might happen when a solid becomes a liquid, to embody the learning (Stolz, 2014). Overall, I am satisfied with the success of this lesson, but I also value the importance of reflection to improve the implementation of this lesson in the future.

References

Bliss, J., Askew, M., Macrae, S. (1996). Effective Teaching and Learning: Scaffolding Revisited. *Oxford Review of Education*, *22* (1), 37-61. https://www.jstor.org/stable/1050802

Pedretti, E., Bellomo, K., Jagger, S. (2015). Explorations in Elementary School Science: Practice and theory k-8. (Pearson Canada Inc.) https://bookshelf.vitalsource.com/#/books/9780133553475/

Stolz, S.A. (2014). Embodied Learning. *Educational Philosophy and Theory, 47(*5), 474-487. Doi: 10.1080/00131857.2013.879694