5E Reflection

(Audio file names: Audio 1-1113, Audio 2-1114, Audio 3-1125, Audio 4-1116)

The engagement part of the third grade properties of matter lesson plan was going to be introduced by showing the class a short video clip from the movie Despicable Me. The video was approximately forty-five seconds long, and showed many different types of matter. I had prepared to show this video to the class by saving the link in my email so that I could pull it up on my collaborating teacher’s computer. Whenever I went to pull up the link, the video would not play because the source was from You Tube and the school had blocked this site. My collaborating teacher didn’t know how to override the block, so I had to improvise the engage and introduction to my lesson on matter. This was definitely a learning experience when planning for a lesson, and I learned that as a teacher you should always have a back-up plan for when things do not go as planned. I began a discussion with the class by asking them what do you think the word matter means? One student responded, “matter is like what matters, and stuff like that”, while another student responded that “matter is solids, liquids, and gases”(audio 1, 3:28). After listening to the audio, I noticed that I did not respond to the first student’s answer, but I responded to the second student that said solid, liquid, and gas. This was able to help me to reflect on how I should respond to every students’ thinking, and help them to make sense of their own understanding of the concepts they are learning.

Students are supposed to learn the properties and relationships of objects pertaining to solids and liquids in grade 1, while they are more focused on the changes in properties of materials in grade 2. It was evident that most of the students had very little understanding of matter when we began the class discussion, but this a great opportunity for the students to demonstrate growth and a better understanding of matter. I introduced the concept of mass by demonstrating the difference and similarities of a golf ball and a ping-pong ball. As I listened back to the audio, I think that I did a good job of comparing the two balls to demonstrate that mass is “how much stuff is in something”. When I first held up the two balls, I asked the class which one has more mass? I had several students respond by saying “the ping-pong ball”, while others said that the “golf ball” had more mass (audio 1, 5:50). After we discussed that mass is how much stuff, or how much matter is in something, the students began to understand that the golf ball had more mass than the ping-pong ball.

The students were able to give many examples of matter in the classroom when prompted such as: “the smart board, the white board, the computer, and the TV”(audio 1, 7:45). When I asked the students why all of these things were matter, one student responded by saying “that they take up space, and have mass”. I was really impressed with how the students were able to connect each type of matter they named in the classroom back to what they learned about mass. When I asked the students if the computer or the golf ball had a larger mass most of the students immediately responded by saying “the computer” because it is “bigger” and has more “stuff” (audio 1, 8:40). Although some of the students were confused that mass meant how big an object was, I kept repeating that is means how much stuff is in something to reinforce the concept of the golf ball and ping-pong ball. Overall I think that the engage went very well with my third grade class, and they were able relate to most of the concepts that were being developed in the introduction on matter. Although the Despicable Me video didn’t go as planned, I was still able to move forward with the lesson without indicating there was a problem to the students. The students stayed on task and very interested during the engage, and I could tell that they were very excited to learn more about matter.

The students observed different properties of matter by describing several different objects during the explore section of my 5E lesson plan. Students collected data based on the physical properties of a nickel, penny, cotton ball, a bottle of coke, bag of water, rocks, empty plastic bag, and crackers. The students focused mainly on what was inside of the objects. For example, the students observed what was inside of the coke bottle and described it as a liquid that was brown and didn’t make a sound. The class began the explore component of the lesson during science the next day after the engage. The students were grouped according to who was at each table for this activity. There are three different groups of students in my classroom, and I allowed the students to stay at their own desk and work with their team members for the explore. This worked very well because each group was given one of each object to record the properties in their science journal. The students rotated the objects around the table until every student was able to observe and record the properties of each object. Each group of tables had a table captain that was in charge of making sure that all of the students stayed on task during the activity, and this was very efficient because I saw all of the students collaborating with one another.

Before the students began the hands-on properties of matter activity, I asked the students what an observation was? The first response from a student was “when you look at something” (audio 2, 6:55). After this response I asked the students to observe different things about me and share with the class their observations. Students responded by saying that “I am wearing green, I am tall, and I have brown hair.”(audio 2, 7:10) Most of the students understood that you make observations by observing and paying close attention to something using the five senses. As a class, the students were able to come up with the five senses that they were going to be using in order to observe the physical properties of all of the objects in the lesson- sound, touch, taste, sight, and smell. We also discussed why we were not going to taste any of the objects that they were going to observe, and that we were going to focus more on the four senses. I made sure to tell the students that they were going to be using adjectives to describe the objects given to their tables, and record the descriptions in their observation chart (audio 2, 12:25). One of the things that worked really well during this lesson was when I asked the students to freeze, and I had the table captains find out where all of the students at their tables were at with recording down the properties of each object (audio 2, 24:25). This worked very well, because it allowed me to know how much time each of the tables would need to finish the activity and what objects needed to be rotated more quickly. All of the students were very engaged in this activity, and worked very well with each other. I think that the hands-on activity was very useful for the students, because they were interested in what they were doing while learning. The students were given around twenty-five minutes to complete the properties of matter activity, then as a class we discussed the properties of each individual object and recorded the descriptions on the board for the students that needed to fill in their own chart.

The students did really well when recording most of the properties of the objects, but some students struggled when it came to observing the empty bag. Most of the students focused on the plastic bag, even after I gave instructions to observe what was inside of the bag. I decided that we would discuss this as a whole class to make sure that all of the students understood what we were observing. One student concluded that “they didn’t see anything, and there was no sound”(audio 2, 46:40). After listening back to the audio, I noticed that I didn’t ask the students what all of the objects had in common? If I were to teach this lesson again, I would make sure to ask the students about the similarities because I think this would help them to come up with the category of solid, liquid, and gas. In the conclusion of this lesson I asked the students what all of these objects are, and then pushed them to think a little further by asking what we have been studying? The students immediately responded that all of the objects were matter. I introduced the term physical property after the class had given the descriptions of each object, and instructed the students that we had described most of the physical properties of the objects (audio 2, 49:20). This was a great way to conclude the explore part of the lesson, because science time had ended and the students had a concrete example and understanding of different properties of matter.

I began the explain part of my 5 E lesson on the third day of teaching. I introduced this lesson by reviewing the activity that the students completed in class on the previous day with the properties of matter. The first thing that we reviewed as a class was the term physical property. I made sure the students understood that different types of matter have physical properties. The purpose for the explain was for the students to come up with a way to sort all of the objects they observed during the explore. I really wanted the students to come up with the category of solid, liquid, and gas on their own, but this task was harder than I had initially expected. I asked the students what some of the ways that we could sort the objects? Students responded with ideas to sort the objects by “alike and different, color, or using a chart” (audio 3, 1:50). After the students shared their ideas of different ways to sort the objects, they understood why some of the categories would not work for all of the objects. I instructed the students that scientists use a specific category of the states of matter to sort different types of matter. The students understood that all of the objects could be sorted into the three states of matter-solid, liquid, and gas. As a class the students sorted each of the objects into the correct state of matter in their science journals, until all of the objects were labeled as a solid, liquid, or gas.

The class began learning about the three states of matter by finger-point reading along with me from the informational text “Inside the World of Matter”. Solid was the first state of matter that the class began to learn about. I used a rock as an example of matter that is in the solid state. Three students represented how a hydrogen molecule forms when atoms bond together, so I was able to introduce to the class that the molecules in a solid have a particular behavior. One student said, “the molecules move slow” (audio 3, 16:43), and this was somewhat correct. I had one group of students from the first table come to the front of the class and to demonstrate how the molecules behave in a solid. The molecules are very close together, do not move relative to one another, but they are constantly wiggling. After the students demonstrated how the molecules in a solid behave, I asked them to write in their science journals what they observed so they could later share this with the class. One student shares with the class “the molecules never apart from each other” (audio 3, 20:10). I was very impressed with how well the demonstration helped the students understand how the molecules behave in a solid. In order to come up with the entire definition for a solid, and for the students to understand the concepts of definite shape and volume, I asked the students what the word definitely meant? The first response from a student was “it means that you are absolutely sure that that’s what it is” (audio 3, 21:25). This was the perfect response to introduce the concepts of definite shape and definite size, because the students would be able to relate to the student’s definition of being absolutely sure of what it is. To end this lesson, the class recorded their own definition of a solid in their science journal. I wrote my definition of a solid on the white board, and most of the students used this definition for the glossary in their journal. One of the things that made a huge impact on my teaching was when a student came up to me later on the same day after taking a school-wide picture and said, “Ms. Heather, we were all like the molecules in a solid today. We were really close together, but everyone was wiggling around”. This was awesome to hear from a student on the same day, because it showed that she really understood the demonstration of the molecules in a solid, and she was able to relate the concept to real life.

The fourth lesson that I taught during the 5E was still part of the explain component. This lesson focused on liquids and gases, and how the molecules behave relative to one another in each state of matter. I began this lesson by showing the class three different sized containers with the same amount of water in each bowl. When I asked the students which container had the most water in it, almost all of the students responded by saying that the smallest container had the most. The students’ reasoning was that the water was higher in the container. After demonstrating that each container had the same amount of water inside, I showed the class a bag of water and had the students make an observation. The students described the bag of water in many different ways. “It is squishy in the bag, it is clear, it can change its shape” (audio 4, 1:50). When the student responded by saying that “it can change its shape”, I asked the students what would happen if I poured the bag of water into a glass? Most of the students understood that the water would take the shape of the container. I had the next group of students come up to the front of the class and demonstrate how the molecules behave in a liquid. The students moved around one another, but were not allowed to leave their circle, which represented their container. After listening to the audio where the students were demonstrating the molecules in a liquid, I don’t think that the students completely understood that the molecules move around each other constantly. One student said “they move around when you shake it”(audio 4, 5:00). If I were going to teach this lesson again, I would have a better way to verbally teach the students the concept of how the molecules in a liquid move relative to one another to take the shape of their container. To introduce the last state of matter-gas, I held up an inflated balloon and asked the class what was inside? All of the students were very excited to share with the class that air is inside of the balloon, and they all knew that air was a type of gas. When I asked the students how they thought the molecules in a gas behave, a student immediately responded, “that they go everywhere” (audio 4, 7:44). I discussed with the class that a gas does not have a definite shape or definite volume, and it takes up all of the space in its container. I explained to the students that if you put the same amount of air into a larger classroom, the air would spread out to take up all of the space in the room. Gas’ molecules are far apart and can move relative to one another to take the shape of their container. The last group of students demonstrated how the molecules in a gas behave relative to one another by walking around each other in the front of the classroom to show that they spread out to take up all of the space. The physical body demonstrations to represent how the molecules behave in the states of matter were one of my favorite parts of teaching the 5E lesson. All of the students responded to this type of modeling and demonstrating, and it really helped them to grasp and understand the science concepts.

I began to teach the expand on the same day after we demonstrated and learned about the molecules in a liquid and gas. To begin the expand I used a phase change demonstration called “ice and string”. The purpose for this demonstration was for the students to observe me picking up an ice cube with just a string. This demonstration immediately got the students attention, because they did not believe that I would be able to pick up the ice cube with the string. The students were able to observe what happened to the ice when I poured salt onto the string and ice cube. The concepts behind this demonstration were a little more difficult for the students to understand, so I focused on teaching them what I thought was the most important idea from the demo. I made sure to tell the students that whenever you add salt to the ice, you are adding heat and it begins to lower the melting point of the ice, causing it to melt more quickly. Overall, the demonstration worked perfectly and I didn’t have any trouble getting the string to stick to the ice cube. All of the students were amazed that I was able to lift the ice cube into the air on the string without anything holding them together.

I was planning on using the dry ice demonstration after the “ice and string” to model a solid changing into a gas, but by the time I went to get the dry ice from Kelly most of the ice had been used. Since things did not go as planned for this part of the lesson, I had the students write what they observed in the “ice and string” demonstration to end the fourth lesson and the introduction of the expand. The next day, I continued and finished the expand where the students built on their previous concepts of matter to learn and understand phase change. I chose to use an interactive game on the smart board for this part of the lesson the day before. I wanted to use a demonstration of a cup of ice to represent condensation and evaporation, but I found a really cool interactive that showed different examples of what happen to water in three different states when you add heat and cold energy so I decided to use both during this part of the lesson. The students worked really well together when we were using the interactive game, and it was evident that the students were learning what had to occur in order for matter to change states. One of the things that really showed that the students understood heat and cold energy was on their summative assessment when they understood that when heat was applied water would melt, and when cold was applied the water would freeze. I changed the expand section in my revised 5E where the students would use a hands-on activity to make ice cream. This activity will help the students to physically see what happens in order for matter to change states, in this case for a liquid to change to a solid-ice cream.

I really enjoyed teaching my 5 E lesson plan as part of my IDP, and I think that it really helped to have five days to teach this lesson plan. The students were engaged and excited for science every day that I taught, and I could really tell a big difference in student learning during science. Almost everyday, the students asked me if I were going to use a demonstration during science. This was very encouraging for me as a future educator, because the students let me know that they were enjoying my lessons and learning from the hands-on activities and demonstrations.

\*Student work is provided on the following page.









