**Lesson Overview**

My lesson is focused on the 3 states of matter, and more specifically the fact that matter expands when heated because the particles move more quickly and have to spread to accommodate the increase in motion and that matter contracts when cooled because the particles move more slowly and realign to fit more compactly. Students will learn about how matter is measured, how temperature affects matter, and the differences between the different states. Students should already have a basic understanding of the three states of matter and how matter can change from one form to another prior to beginning this lesson. Originally, I intended to use a rubric as the sole means of evaluation, but after further thought, I decided to add a student self-assessment to increase and gauge student metacognition.

**Implementation**

Since I am currently off for summer vacation, I was not able to do a test run with my own students. Instead, I implemented this lesson with my husband, Don. As a fellow teacher, he was able to provide valuable feedback and insight into what works and doesn’t work, both from the viewpoint of a student as well as a teacher. Overall, I was pleased with the flow and pace of the lesson; Don was able to complete the assignments more quickly than I would anticipate from a 4th grade student, which was not surprising and is not something I would be concerned with. He was able to find information within the provided resources to adequately answer the essential questions, a vital element in making this lesson successful. Like my students, Don is familiar with Discovery Education’s Science Techbook, so his ease would hopefully be similar to what the students would experience. His attempt at Board Builder, however, was a bit different. Since this is a new tool, released literally only a few weeks ago, this was his first time using it, just as it would be for my actual students. The Board Builder is fairly user-friendly, but it does take some getting used to. Don was able to quickly figure out how to add video, text, backgrounds, and more with very little guidance from me. All in all, the lesson went well and would be successful in my class with only very minor tweaking.

**Reflection**

In this lesson, my “student” learned about the three states of matter, how they are measured, and how temperature affects each state.  The goal was the create a deeper understanding of this topic, as well as clarifying that matter expands when heated because the particles move more quickly and have to spread to accommodate the increase in motion. In order to teach this, the student needed to have access to a computer.

In order for students to be successful, the students need to know how to login to the Discovery Education website and how to locate assignments in the "Student Center". The teacher must know how to create assignments and change the sharing settings on the Board Builder if they wish to have the students share their work.  The teacher must also be familiar with using Board Builder in order to help guide students through the process of creating their own board. My student was assessed using a rubric, as well as a self-assessment. He was assessed on his ability to answer the three essential questions, as well as the quality of his final project. Don were held accountable by presenting his project to the "class". I expected for Don to get through the lesson quite easily in terms of finding information to answer the questions, which he did well. I also expected that he would need more time and guidance with the Board Builder, since this was his first time using it. After some trial and error, and a few questions about certain functions, he was able to complete the project easily.

The Discovery Science Techbook is meant to be the primary science curriculum in our school, so this lesson is meant to be a part of the normal curriculum. If follows the MI GLCEs and provides everything a teacher would need in order to be successful in teaching science. It is an improvement over our previous curriculum in that the Techbook stresses deeper understanding and critical thinking, both vital to true learning. It also serves to support a variety of learners. While unnecessary for my trial run, the students can change the language, have the text read aloud, watch videos or use the interactive glossary if they need extra support, and can highlight and take notes right in the techbook, something we would never let our students do in a traditional textbook. The Board Builder is unique because it provides a new and interesting way for students to showcase their learning. This is a fun, interesting tool that will motivate students to do their best thinking.

Primarily, learning took place using the cognitive constructivist theory of learning. The student explored several resources independently, building upon prior knowledge in order to construct his understanding of the concept. Social constructivism would also be factored into this as well when implemented in class because of the group lab and collaboration. There are a few elements of behaviorism in that there is a minimum level of fixed knowledge the learner must understand as well as a good deal of repetition throughout the activities, labs, and readings.

Technology was vital to this unit. The student completed labs, readings, and videos using the computer and also completed a final project using the Discovery Board Builder. The advantage to implementing this much technology is that the student was able to access all the materials at home without needing a textbook. The technology was also helpful from a planning standpoint because it limited the amount of copies I needed to make. The only disadvantage is that our school sometimes exceeds our bandwidth, causing brief outages.  All of the Discovery materials can be downloaded ahead of time, so I normally have them saved on my computer as a backup.

1: From nurkose.net