

**Nature of STEM assignment**

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One of the most important skills that I imbue in my students in science class is to look at everything with a critical eye and to continue to examine the world around them. According to the Science Learning Hub: “science is an ever changing field that evolves as we gather more information.” I have found this is an incredibly important concept to reinforce to students. At the start of our unit on fossils, I introduced students to the “Magdeburg Unicorn.” This “fossil” has a complicated history and sparks the interest of students when I begin the lesson with it. Assembled in the 1600’s, it is a combination of parts of a narwhal, woolly rhinoceros and a woolly mammoth. I show this “fossil” to students and first ask them if they think it is real. When most students say it isn’t real, I ask them to explain their beliefs. Students often point to the fact it is missing key parts like a neck, a chest cavity and two out of its four legs. I then ask students to gather information that supports or does not support the authenticity of this artifact. Students synthesize information from multiple sources in order to determine what they are looking at. This activity serves the purpose of providing students with an amusing phenomena to explain, gives them the opportunity to make inferences and then find evidence to support their inferences. At the end of this activity, we discuss how it may have been viewed at one time as an artifact of the past, but is now viewed as a poor example of reconstructing a once living organism. This demonstrates that our understanding of science changes over time. Students discuss at the end of this segment the reasons that this artifact may have been assembled and presented as a real unicorn. Students will generally say “to make money”, “to get attention” or “because they didn’t know what it should look like.” This discussion touches upon both the imaginative nature of science as well as the social and culturally embedded nature of science. The unicorn was a

product of the creativity of the “scientists” of the time, and reflects the lack of education that the average individual might have had during the 17th century. Although this segment is just part of a lesson, the phenomena of the “Magdeburg Unicorn” continues to be one of the most memorable parts of the fossils unit for my students.

I believe the most crucial component to enhancing my teaching and thinking dynamically is continuing to incorporate new sources, practices and peer review into my teaching. Engaging with my professional practice with a growth mindset and striving for improvement and the continued development of my skills as a teacher will only enhance and strengthen my use of the tenets of science in the classroom.

According to the Science Learning Hub, “All observation is preceded by theory and conceptual knowledge. Science tries to overcome this lack of pure objectivity through the scientific community, which scrutinises scientific work and helps balance individual scientists’ leanings.” This tenet’s focus on the subjective and theory-laden nature of science can be applied to my own classroom practice. I know that my strongest subject areas are earth science and life science. My fascination with animals and dinosaurs has translated into many hours outside of the classroom learning about topics such as scientific discoveries about animal behavior, new ideas about dinosaurs and evolution and the spread of invasive species over time. As a result, some of my strongest lessons in science class have allowed my students to explore these topics while building critical thinking skills. Although I am working towards spiraling all aspects of science into my classroom, I am not yet there. According to Allie Koleman “Spiraling allows repeated learning of a concept, each time with increased depth. By using a

curriculum rooted in inquiry and authentic phenomena, I could spiral scientific concepts, facilitating deeper understandings and connections for my students.”

When I objectively look at my classroom, I know that my weaker subjects such as physics and chemistry are not taught at the same level that my lessons about earth science and life science are taught. By embracing the idea that my tendencies for teaching demonstrate bias towards my strengths, I can work to change this by utilizing the multitude of sources that I have been provided with in order to expand my pedagogical knowledge in these specific areas. I can also utilize peer feedback for my lessons and teaching (just like scientists do in the scientific community) in order to balance my leanings towards focusing on certain aspects of science. By working towards improving my spiraling of all of the aspects of science, I will also be working towards improving my use of the tenets of science in my classroom.

Science ties in to the nature of mathematics in many different ways such as data analysis, problem solving and making connections. In our recently finished unit “A Place Called Home”, students looked at the impact of deforestation on the ecosystem and its inhabitants. One virtual lab that they worked on focused on the Bornean Orangutan. During this lab, students changed variables such as food and water in order to look at how it affected the orangutan populations over time. Students had to analyze graphs that demonstrated the effects of these variables and interpret the results. This particular lesson is a prime example of how data analysis directly ties into science.

According to NCTM, problem solving “is an integral part of mathematics, not an isolated piece of the mathematics program.” Problem solving is also an important part of science. Part of the exam that students completed for “A Place Called Home” involved

students reading about the depletion of a population of red pandas. Students had to read about multiple problems that resulted in the decline and determine the best program to give the red pandas a chance to repopulate. In order to successfully solve the problem, students had to distinguish between the major problem and minor problems that decreased the red panda population. Much like a math problem, this conundrum presented to students had to be solved in steps. Students also needed to connect their lab about the orangutans to the problem in the assessment. Students needed to make a connection that the deforestation that caused the decline in the orangutan population was also the primary cause for the decline of the red pandas. This connection would help them address the best solutions in order to protect the red panda population. This is similar to students making connections when they learn an equation in math class and must apply it to other problems. The connected nature of math and science demonstrates the need for more cross curricular opportunities to help students solve problems just as scientists do in the real world. Although math and science are traditionally taught as segregated subjects, they are in fact intertwined and should be taught in conjunction as they are used in the real world. Changing the way that science and math are taught will only help prepare students for colleges and careers where they will need to use skills from both worlds together in order to solve problems and complete tasks.

## References

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