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Methods of STEM Education
Missed Class 6/1/2020

I loved the quote you shared from Vince Bertram. That is basically how I approach teaching my STEM classes, regardless of whether I am teaching my junior high kids at school or my K-2 kids at the after-school program. I also believe that STEM is at the heart of everything! That quote certainly does resonate with me.

In comparing the two representations of the scientific method, I feel the circular representation is more how scientific investigation and study work in the real world; however, I can see benefits and detriments to both. One benefit of the "traditional" method is it gives people a specific place to begin. When taught as a beginning or introduction to scientific investigation, it can be an invaluable tool. The danger in teaching this as *the* method is that people grow to believe this is the *only* way science is done, which simply is not true. It is how science is done *sometimes*, but certainly not always. I loved the example Stephanie gave about the different teams at NASA and how some teams were brought in only at specific points in a project. NASA would never accomplish anything if they had to start back at the beginning every time a new team was brought in!

This is one instance in which having a more generalized version of the scientific method is useful. There is no one specific starting point, and it illustrates that there is no definite end. This is helpful to teach students because they need to understand that scientific investigation does not always begin with a hypothesis. Sometimes, it begins with a question or a person saying, "I wonder what would happen if..." Those questions or statements can then lead to a formal hypothesis after initial investigation and data collection, and that formal hypothesis gives others a chance to then repeat the experiment under varying conditions to see if the initial findings still hold true. Of course, this is only one of many ways this model of the scientific method can be used.

One person mentioned that the circular model could even look like a spider web, which I had kind of initially thought as well. Science can be messy, and investigations can go in many directions. What I am wondering as I am pondering this is what if the "traditional" scientific method is not so much a blueprint for conducting investigations as it is a model for organizing findings and writing lab reports? When I was in junior high and high school, this was not only how our lab directions were arranged, but it was also how our lab reports were to be written. The advantage is that information related to the investigation is organized and (usually) easy to follow, making it easy for others to repeat.

By the way, thank you for sharing the resources! I like the stuff from NOAA and NASA for STEM/science classes. I can absolutely see the bird site being useful in math, science, and STEM classes. What a cool resource! Is there also one that tracks butterflies or other migratory animals?