

Scientific inquiry is an essential component of any science lesson. This is a pretty basic idea, but complex in nature. Many times teachers “follow the script” and present lessons based on the instructional process where information is presented, practiced, and assessed. This definitely has a place in our lesson planning, but even more important than this, is fostering the inherent curiosity the children have to find out how the world works around us. I believe this is best done through an inquiry based instructional lesson.

According to the National Research Council in the “National Science Education Standards” (1996)¹, scientific inquiry is

“a multifaceted activity that involves observation; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answer, explanations, and predictions; and communicating the results.”

This statement on its own is an excellent beginning to back the need for scientific inquiry in the elementary levels. When we break the statement down into the basic components, there are many key words or phrases that give us direction on what scientific inquiry is. Through this reflection, we will also be able to determine what scientific inquiry is not.

In the elementary science lesson, we should understand that science truly is multifaceted. It is not solely linear in progression and often times draws upon other academic areas. It involves using various methods and materials. As it states above, it involves observations. When we look at this, observations play a key role. The students must be provided the opportunity to gather evidence through various means. This is evidenced in the Iowa Standards (iowacore.gov) such as 4-PS3-1 where it states “use evidence”; 4-PS3-2 “**make**

¹ National Research Council, *National Science Education Standards*, The National Academies Press (1996).

observations"; and 4-PS3-3 "ask questions."² Note that I am using the fourth grade standards as I taught this grade level. All of these standards use the data from observations. In fact, if we read all of the 4-PS3 standards in totality, we see that the basic components of the NRC statement quoted above are explicitly stated. This on its own should provide us enough reason to use scientific inquiry during our science lessons.

A second reason to have scientific inquiry based lessons is related to the natural curiosity our students bring to the classroom. Regardless of their science background knowledge, every child brings this trait to our classes. When we reflect on our own childhood, we all should have fond memories of mixing different liquids just to see what happens. We naturally took things apart, sometimes breaking them, to find out what is inside or to see how they work. We would sit and look at how creatures moved and wondered how they did it with all those legs, the wings, or other appendages. This natural curiosity should be fostered in our classrooms through a well-structured science lesson plans.

This thought is something that Anders Schinkel described in the article, "The Educational Importance of Deep Wonder." (2017).

"...wonder is not a single thing, and it is important to distinguish at least two kinds of wonder: active wonder(ing), which entails a drive to explore, to find out, to explain; and deep or contemplative wonder, which is not inherently inquisitive like active wonder and, as a response to mystery, may leave us lost for words.

The idea about this natural desire is that it allows our students to use this natural ability to observe what is happening in their environment, bridges the gap between classroom lessons and self-fulfillment of play, draw upon their own skills of inquiry to inquire and observe the

² <https://iowacore.gov/standards/science/4/energy>

phenomenon happening in the controlled laboratory/classroom setting, and use skills ranging from interpersonal to communication, to content areas to support their learning.

These two basic arguments for scientific inquiry provide enough rationale for teachers to use this in their classrooms. Whether it is to use current materials that have this built in, or to supplement the lessons/units/series which don't, scientific inquiry needs to be utilized to help foster that natural curiosity to help explain the world around us.