Earth science at Cheney high school has largely been taught in the context of how it impacts on other subjects. For instance we talk about chemical cycling (water, carbon, and nitrogen) in biology as it pertains to ecosystems and population growth. We discuss the implications of global climate change and how it impacting species when we discuss population ecology and natural selection. We investigate water quality in our chemistry classes with regard to properties of water, water availability and the crisis in Flint, Michigan. We have very seldom taught the NGSS earth science standards explicitly to students as we do not formally offer a class in earth science. This was a problem we set out to address over the last few years as we began to truly delve into NGSS and its implications for our state assessments but more importantly for our best practices with students.

I should start by talking about our course model at CHS. In my 6 years here we have always taught physical science to our freshman, biology to the sophomores, and chemistry to (most) of our juniors. We recently made a decision to swap biology and physical science because too many of our freshman struggled with the algebra concepts covered in both the physics and chemistry sides of the course.

In addressing the NGSS at Cheney we recognized the problem we had in not presenting a true earth science course and set out to rectify that. Our “Band-Aid” for the problem of not expressly teaching the earth science was to split the earth and space science standards between 8th, 9th, and 10th grade. We worked collaboratively with our middle school and high school teams to identify areas content “fit” and where students were hopefully ready to receive the information. A number of my colleagues and I put in many hours working to find a solution that met this need. The good thing about it was we found a solution that seems to work – at least in the meantime. The downside to our plan was the earth science became the background through which we taught our content – never really the focal point. One of the many reasons I pursued this professional development opportunity was to try and make earth science more of a center piece of my classroom.

Sustainability is a topic that has been growing in importance to our curriculum at Cheney HS over the last few years. In fact quite recently my biology students completed their “eco-column projects” where they plan, design and construct a terrestrial and aquatic ecosystem inside a series of sealed two liter bottles. The purpose of this project is for students to use their understanding of previous biology (and ultimately earth science) standards to create a model of a sustainable ecosystem on a much smaller scale. The project is not graded on success of the project but ultimately how do they interact with the results – if the pH of the water in their column rise or falls can they explain what might have caused it. Students make claims about the results, defend it with evidence and then provide a rationale/reasoning to support their claim. In other cases sustainability plays a role in how we talk about population dynamics/growth, chemical cycling, and ecology. Unfortunately, much like the earth science standards, sustainability has been a bit of an afterthought in our instruction.

Fortunately I work with a group of people in a department and in a school district that is highly supportive of science education and are excited about the potential of NGSS instruction. We are dedicated to implementing NGSS in our classroom in meaningful and important ways. As a part of our PLC (professional learning community) initiative started at the district level we have begun to “unpack” the standards to identify areas of strength and weakness within our current model – and have identified sustainability and earth science as two of the many places we would like to improve. Our goal is to use this workshop – among other opportunities – to support our work and build up our curriculum in such a way that we can meet the intended goal of NGSS and give students the skills and resources they need to be productive, analytical, and active members in their world moving forward. The only limitation that I can foresee to implementing this work comes from our current course structure – at least for next year we are teaching biology, physical science, and chemistry to the majority of our general education students and that means we will have to mix together our past work with new practices.