

Investigating Earth's Spheres Paper

It is important to teach all the spheres in an Earth science class. I do feel that you need to teach the Hydrosphere, Lithosphere, Atmosphere and Biosphere. In teaching the spheres I learned how it is important to teach the spheres separately, so the students see the spheres as their own identity. I have taught Earth science for almost six years, and I did not really teach any of the spheres, especially the Lithosphere. The Lithosphere is the one sphere that I did not teach at first when started to teach I did not go into details about the Lithosphere. Now I am working on making sure I teach more about the Lithosphere when I teach the Earth's layers. The 8th grade Ohio Science standards focus more on Earth's layers, which do not include teaching the different spheres. However, After I started taking the Eyes on Earth: Teaching Earth Science from Space, I noticed that for students to fully understand Earth's layers that sphere should be part of their foundation knowledge.

What I have learned is to make sure I incorporate more technology into my lessons. One article that stood out to me it states, "the use of geospatial data in the classroom as supportive technologies used by learners to construct new understanding of the world, not unlike the role that conventional media such as print maps have played in advancing learning" (Doering and Veletsianos, 2007, p.218). This article states that to help the students to really understand what is happening on Earth need to use technology to enforce their learning. This means as a teacher I need to use NASA sites like NASA Earth Observatory, Google Earth: Voyager and many more sites. What these sites do they make the content that the students are learning come to life by making them more interactive and they can see things interact with other parts of Earth. Therefore, when I teach the Lithosphere, I can use these sites to show how the tectonic plates move and interact with Lithosphere. Now my students should have a better understanding how the Lithosphere works with the crust and the mantle.

When teaching all the spheres it is better to teach them separate so the students know that they are their own sphere, before they learn that they are connected to each other. By teaching the spheres individually, the students will have a better understanding of each sphere and why each one is important to the Earth. Teaching the spheres in isolation helps students focus in on and understand the sphere with greater detail. The teacher needs to make sure you do not overwhelm with all the spheres. I have noticed that when I give my students a lot of information

at once they have a very hard time understanding what I just taught. So, Teaching the spheres in isolation is a great way for them to fully understand each sphere.

What I learned from this class is I teach the spheres separately so you can focus on one part at a time. In learning to teach the spheres separately this will help me show my students how each sphere is affected by climate change when I teach them about climate change. Every year I take some time to have my students write an argumentative essay or make a presentation on if they believe in climate change or not. Now I am going to teach this a lot differently than previous years. I am going to focus on each sphere to teach my students how if one area is affected then it will start affecting the other spheres. In fact, “scientists have identified an unsettling trend—as levels of CO₂ in the atmosphere increase, 86% of land ecosystems globally are becoming progressively less efficient at absorbing it” (Smith, 2020). This shows that we are affecting the atmosphere with carbon dioxide then in result another sphere is being affected which this sphere would be the Biosphere. The students would be able to go to the website called NASA Climate Change: Vital Signs of the Planet where they can see firsthand how each of the spheres are being affected by the carbon levels. Once my students have looked at the two spheres of Biosphere and the Atmosphere and how climate change affects them, we would start looking at the hydrosphere. When my students start looking at the Hydrosphere, they will be surprised what makes up the hydrosphere. Therefore, when the students start looking into the Hydrosphere, they can break the Hydrosphere down into sections. Since they are just looking at one sphere at a time, they can focus on more of what makes the Hydrosphere. Then once they have a better knowledge, I can go over how each part of the Hydrosphere is being affected by climate change differently. In teaching each sphere separately the students would be able to just focus on one part at a time and would not be overwhelmed. This will be great for me when I start teaching my climate change section, because my students will be able to focus on one area at a time and make a better connection how climate change affects each sphere.

What I have learned is I need to teach each sphere separately, so my students fully understand how each sphere works and I have never done that before now. I teach in Ohio, so we do not follow the NGSS standards and for eighth grade Earth Science, we do not have a standard for teaching climate change. The focus is more about how Earth and the different layers were formed. Last year I started to add the Lithosphere, but I really did not go into details what the

Lithosphere was. Now I have learned more about the Lithosphere, and I will make sure I go more in details next years. The reason for this it is important for my students to understand how the upper mantle and crust makes up the Lithosphere and how it moves and changes the Earth's surface. With having the complete understanding of why we should teach each sphere now I can change how I approach my lesson differently. As I stated above, I do a small section on climate change to give my students an understanding what is happening in the world. A couple years ago I had my students do an argumentative essay on climate change and they had to choose a side. Once my students turned their papers in, I was really surprised that about eighty percent thought that climate change was a hoax. This showed me that I did not do a good enough job in showing how all the spheres where being affected by climate change. Now having a learned that teaching the spheres separately will be very helpful when I teach my class about climate change next week. The ELA teacher is going to teach about the climate change, and she was asking about it, because she does not have a great knowledge of climate change yet. In thinking about it right now I broke each sphere down for her and explained how when you affect one sphere it affects the other spheres. So, I just realized that it is better to teach the Lithosphere, Hydrosphere, Atmosphere and Biosphere separately.

When I think about what sphere my students would struggle with it, I feel it would be the Atmosphere. When I ask questions and talk to my students, I get the understanding that they have no idea what the Atmosphere does and why we need it. When I start teaching the Earth layers and we talk about Earth's core my students struggle to figure out why the core is so important for us. They are always surprised that the Earth's core makes are atmosphere. They don't realize how it protects us from the Sun and other objects in space. Once I start teaching about climate change and how it affects the Atmosphere they will be totally blown away. When we get into how CO₂, methane hurt the Atmosphere I feel they will struggle with it the most. The other spheres they have some ideas how they work and how we need to coexist with the spheres. I feel that they will have struggle with making the connection that the Atmosphere is also connected to the Hydrosphere, Biosphere, and the Lithosphere.

Since I started to this class Eyes on Earth: Teaching Earth Science from Space I found how many different sites and tools that NASA has for educators. The NASA Earth Observatory is a great site that I have already starting to use in my classroom. I have used some of the photos

of the before and after pictures of a major landslide to get my students attention. I have learned how important it is to use phenomena in a lesson to hook the students into the lesson. With this class I learned that “in science classrooms, we encourage students to collect data as much as possible” (Marrero, Gunning, Woodruff, 2016, p.282). This shows me that in my science classroom I must have my students collect authentic data as much as I can. So, I can use the “My NASA Data” site to have my students’ collect data on any topic that we a relearning at that time. With that said starting next week I am going to start a small climate change lesson with my classes. I will go over all the sites to show them how many sites and information “NASA” has out there for them to use. One site from “NASA” I will use right away when I introduce my climate change lesson will be “NASA Global Climate Change”. This site has all kind of great information and real time data for my students use and to see. For the rest of this year while I am teaching, I will include all these new “NASA” sites. Then next year right at the start of mu Earth science curriculum I will add these wonderful “NASA” sites in my lesson to help my students completely understand how all the spheres work on Earth.

References

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