

Domain 4 Sample

4a. Reflecting on Teaching

After implementing this lab activity for this unit the past three years, I reviewed my previous notes on this lesson and decided to break it down into three separate stages. This decision along with information gained through informal daily observations of the students allowed it to be more of an effective review of the material prior to the DNA unit exam. By allowing for more time and detail in the lab, we were able to review the safety concerns in the use of chemical indicators to test the biological molecules prior to the lab instead of trying to fit everything in one class period.

In the days prior to the activity, the students and I filled out a graphic organizer outlining the steps of the experiment using the testing agents. This was beneficial because it allowed me to assess which areas of the lab the students were still unsure of and I was able to answer insightful questions students posed about their ability to actually see this microscopic material. At that time, students were also placed into heterogeneous learning pairs ahead of time allowing students to communicate more with each other before the activity to identify the procedure and expectations laid out for the lab. By placing them into groups ahead of time, I could then act as a facilitator overlooking and monitoring all of the groups during the lesson which is a continuous goal of mine. By pacing the activity this way, all of the student groups were able to complete the testing and data collection of the lab.

Other successful outcomes from this project were that students were actively engaged, communicating and working together to understand the correlation between biological molecules and their relationship to our everyday lives. In their written analysis they were able to identify specific test results and apply their results to the information presented in the beginning of the lab connecting it to the material covered in the unit such as DNA replication and the synthesis of proteins. In using this activity in the future I would continue to add more questions directly tying to biotechnology and genetically modified organisms. Hopefully, by posing those connecting questions, students will be able to see real life application and ideas to the material they are learning in class.

4b. Maintaining Accurate Records

Prior to starting this unit on DNA, students were given an informal pre-assessment assignment to trigger prior knowledge and key terms to understand how living organisms need genetic information that encodes instructions to form cellular structures and perform key functions in order for living things to survive.

Students were then given their assessment folders and student portfolios and were tasked to identify key areas in previous units that were connected to this newly introduced topic of DNA replication, transcription, and translation (protein synthesis). Through review of the students' assessment portfolios, we were able to review key ideas of found in the Biochemistry unit of how DNA is one of the four major macromolecules. Students also made connections to the cellular unit and introductory unit based upon the characteristics of living things. Also, by reviewing key components from our unit on biochemistry students were able to make a connection to the new material being introduced during this unit on DNA.

In order to track student progress throughout the year, each student has an assessment folder which contains their graded assessments and work products for the class. Having this system allows students and myself to reflect and view their progress and quality of work as they continue to navigate through this course.

As this activity was introduced, students completed a pre-lab assignment to check their understanding of the importance of biological molecules and their connection to living things.

At the end of this lab activity, students analyzed their collected data, discussed their findings with their partner and other groups and completed a written analysis of their findings while making authentic connections to their everyday lives. The lab data and analysis questions were collected and graded for comprehension. Upon further review of the lab activity, the students recorded their graded lab report in their assessment tracker and filed their completed assignment in their assessment folder.

4c. Communicating with Families

Throughout the year I have maintained communication in a variety of ways with several parents of students in this Biology class. There is a distinct transition period between Freshmen and Sophomore year in which academic rigor increases among other demand placed upon students. Together at the start of the year, the students and I addressed our goals both as a class and individually and together with input from parents and guardians we have opened a continuous line of communication and support so that their child has every opportunity to reach their academic goals. For example, bi-weekly emails updating academic progress, behavior, anticipated schedule of upcoming major assignments, and areas of needed remediation which are communicated to parents. Phone calls and parent conferences with the student in attendance have also helped students become more aware of their responsibilities. Additionally, having informal meetings with students has helped them voice their concerns and goals which has given them ownership of their learning. These meetings have also allowed me to effectively plan my lessons to meet a variety of needs expressed by students. As a result of this active communication with parents and students, I find that my students are more comfortable speaking with me regarding concepts and assignments that they find they are struggling with. This has allowed me to design future lessons to play to their learning styles and strengths while also working towards strengthening areas in which they continue to struggle.

4d. Participating in a Professional Community

In preparation for this lesson, I consulted with my PLC and other science teachers regarding my former lessons and approach with this lab activity. I was provided with a number of different suggestions of this activity and after speaking with them and reviewing my previous notes on the lesson I was able to adapt it to meet the needs of my students. Evidence of the modification was the addition of trying to extract DNA out of a banana in addition to the strawberry. After I modified and adapted the activity, I provided two of my colleagues in my PLC with a copy of the activity to review to see if the directions and goals of the activity were clear and if there were any other safety issues to consider. I also wanted to receive any constructive feedback on my approach or any other instructional strategies that may be helpful in engaging students in this activity. My PLC gave me great feedback and two of my colleagues who have never done the lab before requested a copy to use with their students.

4e. Growing and Developing Professionally

I had attended an informal review of how to use and interpret the data and information from our emetric system as well as a review of the projected student data from PVAAS. Reviewing that data has allowed me to see some background information on my students to help me better understand them and their needs in the classroom. Actively working alongside members of my PLC and using their constructive feedback has helped guide me to clearly identify the learning outcomes of the lesson. Additionally, working with some of my student's case managers other has allowed me to identify key areas of the curriculum that I need to adjust and present differently while effectively tying in the state standards that students are struggling in and coming up with more effective strategies to remediate those areas.

4f. Showing Professionalism

I've allowed the students to review previous assignments and perform corrections to assessments explaining where their errors on the material arose from. Students responded to prompted questions and were surveyed about different components of the lab that directly connect to their everyday lives such as nutrition and genetically modified organisms and the effects of mutations. Students were able to add comments and personally reflect on the activity, so that they may communicate and share their opinions and suggestions for the lab submitting their reflections and concerns to a private and trusted audience. This also allows me to reflect and improve and adapt the lesson for next year or for a different class. These reflections allow students to voice their concerns in a safe environment allowing them to take more ownership and responsibility to their own learning.