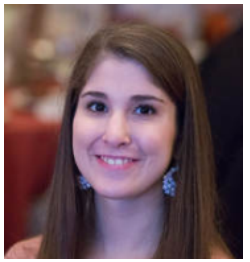
UTeach Maker - Showcase Lesson Overview

Kira Lowery (Spring 2018)



Lesson Title	The Cells and Me
UTeach Maker	Kira Lowery
Name of collaborator/s	Shelly Rodriguez, Patrick Benfield
Subject and grade level	Science 7th Grade
Link to lesson plan and materials	https://klowerymakered.weebly.com/maker-education.html

Lesson Description:

This lesson is a two week maker project that helps students really identify the main functions of plant and animal cell organelles. The project was presented as a challenge for students to design an interactive 3D model of a cell in order to use it for educational purpose. They were to invent a fun model that would be entertaining to younger students. Students were paired with a younger class of 5th graders at our school so that they could help students learn the parts and functions of an animal or plant cell.

Lesson Development:

When I first met with Shelly and Patrick to discuss the type of lesson I wanted to do I knew that cell structure and function was the topic I wanted to cover. It can be difficult for students to understand and many misconceptions can be formed. The content is hard to visualize and contains a lot of difficult vocabulary. The previous year I had done a cell project but it had many constraints. In order to make this lesson personalized and individualized for students I framed it as a challenge for them to make an interactive model that younger students could understand.

I also allowed students to choose any materials they wished to use and take control of how their model would be interactive.

Lesson Implementation:

1. Introduce maker mindset and tools that can be used during the project with a small introduction lesson. “Musical Celery” is a great way to introduce tools like Makey Makey and Scratch.
2. Have students make group contracts
3. Have students brainstorm and rough draft their project and needed materials. You can do a class materials list that is for bulk supplies.
4. Students start their project with a researching the cell structure. Students should identify each major organelle what it does in the cell and how they can represent it in their 3D model. This is were students start to make connections between function and appearance of organelles.
5. Once students have a plan for their model they can begin to code using Scratch or other interactive programs and build their 3D model.
6. Leave some days for testing and redesign of their models.
7. Publication to a group of younger students who are able to test the interactive models and provide feedback for the student makers.

Connection to important concepts and skills within the discipline and/or across subject areas:

7th Grade Science TEKS:
12.(D) differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;
12. (E) compare the functions of a cell to the functions of organisms such as waste removal; and
12. (F) recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life

Cross Subject Areas: Journaling of their maker project experience, technology by coding using programs such as Scratch

Reflection:

This maker project really brought out engagement among all my students. They were able to identify each organelle and its major functions in the cell. Students had fun while learning and were able to gain valuable time working with a peer. Things that should be considered when implementing this lesson is how to handle when one student in the group is absent. How is each student being held

accountable for the content and how to assess student learning during the timeline of the project. Most of my assessments during the project were warm-ups, exit tickets and formative assessment by asking questions during the period while students were working.

Providing accommodations for students who are multilingual learns is important during this project because of the amount of academic vocabulary being learned in a short amount of time. There are lots of animations and videos that help students learn and visualize cellular structure. For example the Introduction to the Cell video by Amoeba Sisters is a great resource: https://youtu.be/8IlzKri08kk

What Went Well:

Students were engaged throughout the maker lesson. Students were able to make connections with various everyday objects and the structures of organelles. Students were able to practice using academic vocabulary in a risk free environment that increased their confidence with words and their meanings.

Thoughts for the Next Iteration

To improve for next year I hope to have students make more structured project management timelines each day so that they will know exactly what they need to get done during a class period. I also hope to have more variety of assessments, both summative and formative during the project to help identify any misconceptions and areas of clarification.