

Chapter 20



Anna McGowan: Cells Alive! An Exploration of Animal Cells

Teaching was my first passion as a student in Boston. Before becoming a teacher, I worked in other professions such as the music industry, social work, health care marketing and advertising. I realized that I wanted to share my love of learning with students and to contribute positively to urban public schools.. After completing the Chicago Teaching Fellows Program, I have worked as a Middle Grades science teacher for the past 5 years, most recently at Sauganash Elementary School. Next, year, I will be teaching STEM for students in grades K-8. I have a Bachelor of Arts degree in Biological Anthropology from Harvard College, a Master of Health Services Administration from the University of Michigan (Go Blue!) and a Master of Arts in Teaching from Dominican University. When I am not teaching, I enjoy spending time with my three children, cooking Italian food, reading and listening to music.

Cells Alive! An Exploration of Animal Cells

Grade Level: 7th

Content Area Topic: Life Science - Cell Structure and Function

Content Area Standard(s):

MS-LS1-2: Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.

Learning Objective(s):

The purpose of this activity is to explore the structure and function of animal and plant cells. The students will then be able to construct a model of an animal cell using household items and will be able to explain their choices for selecting the items in order to represent the parts of the cell, students had to define.

Suggested Time Allotment: 60 minutes

Sequence in Learning:

We just finished a unit on human body systems, where we learned that each body system has a collection of organs and tissues that perform very unique functions or jobs in the body. Now we are going to explore the next level in your body - the cellular level. The lesson will prepare students to dive deeper in the individual parts of the cell so that they have some contextual knowledge. The next lessons will involve exploration of cells on microscopes, and creating a cell model of plant cells.

Materials & Resources Needed:

- Ziploc bags (2 per student pair)
- A variety of materials to represent cell parts, such as buttons, pasta, pipe cleaners, and beads
- 1 cup of Karo syrup for each student pair.
- Inside a Cell worksheet
- Cells Alive interactive website (www.cellsalive.com)
- Access to computer or tablet

Activity is based on the lesson below:

<http://sciencenetlinks.com/lessons/cells-1-make-a-model-cell/>

Lesson Activities & Sequence:

Teacher began by connecting the lesson to the previous unit on human body systems and explained that the next unit would explore the structure and function of cells. Teacher then directed the students to log into the Cells Alive website (www.cellsalive.com) and explore the simulation that shows the parts of the animal cell. Students were then given an Inside the Cell worksheet and were then directed to work in elbow pairs to complete the worksheet using the simulation as a guide. The goal of the exercise was to expose students to the structure and function of animal cells using technology. Students were given fairly dense definitions of the cells, and they were directed to simplify the definitions and paraphrase them in their own words. After ten minutes of this activity, the teacher explained that the next section of the activity would allow them to “build” a cell model using various items (i.e., skittles, pasta, beads, etc). Students were given the remaining 20 minutes to put their cell models together, and also complete the worksheet.

Proficiency:

Students will have completed the “Inside the Cell” Worksheet that has the descriptions of the organelles and their functions paraphrased in their own words. Students will also have completed a model of an animal cell using the materials that were provided in class. Students will also have a baseline understanding that the cell is similar to a human body system in that it too has parts that perform specific functions. I will evaluate the assignment based on the degree of completeness of the worksheet and the verbal explanations that students gave about their cell model. The lesson is designed to be assessed formatively. Teachers should grade the worksheet based on the level of effort completed and the cell model should have a minimum of ten objects within the “cell membrane.”

Feedback

Teachers As Learners:

Students enjoyed the interactive nature of the cells alive website in exploring the defining the parts of the cell. They also enjoyed creating unique cell models using a variety of interesting items. Some students preferred to play around on the simulation and complete the worksheet while the others took more delight in the selection and justification of the items used to represent the parts of the cell. Students felt the manipulatives helped convey the meaning of the parts of the cell. Initially students had trouble finding the website and the correct link that they needed to find, so possibly the directions were not as clear as

they should have been. The sixty minute session was condensed into 30 minutes for demonstration purposes, so a few students did not have an opportunity to finish the worksheet.

Students could have been prompted more frequently to explain why they were choosing the specific objects they did to represent the parts of the animal cell. Students were asked to move on prematurely from the worksheet phases so they could experience putting together the cell model, and students in a real classroom setting would have been given more time to complete those sections.

Teacher was very warm and approachable. Teacher also encouraged people to work through the difficult words in the simulation and focused on understanding the big picture in addition to the specific parts. Students liked the exploratory and interactive nature of the lab, and appreciated that the teacher did not model a sample “cell model.” The goal was to get an introduction to the cell structures and functions, and it was OK to work through the difficult parts of the simulation. Teacher was very flexible when issues arose with the technology and facilitated students quite successfully.

Elements of Pretty Good Practice:

Teacher connected the prior unit on human body systems to the lesson, which was the beginning of the cell unit and explained the parallels between a system and a cell. Teacher also activated prior knowledge and asked students what cell structures and functions that they already know. Teacher used an interactive website (www.cellsalive.com) to allow students to explore the names and jobs that the organelles have in an animal cell. Teacher also provided a kinesthetic exercise that allowed student pairs to create a unique cell model, all the while asking them to complete a worksheet which asked them to paraphrase and synthesize the complex text in the cells alive simulation. Students worked cooperatively in pairs, and teacher acted as a facilitator for the majority of the teaching demonstration. The lesson was great for differentiation - the number of cell parts could have been shortened for the first lesson.

Modifications and Adaptations:

In other classroom settings, students could have been asked to bring materials from home to increase their engagement in the cell model building. Also, students could have been asked to extend the activity to a plant cell.

Questions Arisen:

My colleagues wondered if students should have been asked to formally explain why they chose the items that they did in their model. They also wondered whether students would have access to technology to complete the assignment. They also wondered whether it was a one-day or a two-day lesson.

Peer Feedback:

Overall, my colleagues enjoyed the lesson and thought it was a good mix of technology, language arts, and hands-on learning. They appreciated that I did not model how to build the cell model, because they felt that would bias a learner to make the same creative choices.