

# Mission Biotech Gaming

A Study of How Video Gaming can make difficult subjects in science easier to understand in  
High School setting

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## Abstract

I will be bringing in biotechnology into my classroom by using video gaming and introduction activities focused on biotechnology. Every year, more and more students have been using video games for entertainment, building hand-eye coordination, and education. Teachers and parents have known that when information is presented in game form, learning is a natural outcome to the game.

I will be using the biotechnology game called Mission Biotech. This 3-week lesson series will be teaching students about laboratory safety and equipment, basic cell anatomy, DNA and RNA structure and function, viruses, biotechnology careers, analyzing PCR results and understanding of the virtual learning environment.

## Rationale

The purpose of this study is to describe the effects of videogaming to teach a usually difficult concept for students to comprehend and retain. I chose this project because in recent years I have seen a decline in the basic knowledge of simple cell biology. Cell biology is taught in 10<sup>th</sup> grade biology and is a prerequisite to Honors Anatomy and Physiology. But by the time the students get to me, they have either not been taught it or have forgotten it. To me, the knowledge of microbiology is the key to understand anatomy and it's physiology at the tissue or systems level. I do also notice that in everyday conversation between the students, they talk about their afterschool activities and it always seems to turn to videogames. And within this age group, the question of higher education, and/or career is on the minds of the students, if

not their parents and guidance counselors. My research question naturally would be the following: If I taught cell biology and biotechnology within different career fields using videogames, would that improve the retention of the information? I would be infusing the information that is required for graduation using the preferred student vehicle of learning of videogaming.

I would start by having the students read a book, *The Immortal Life of Henrietta Lacks*, by Rebecca Skloot. This book tells of the history of obtaining viable human cells for research. Staying on the same lines as the videogame lesson plan, I would show an animation of DNA/RNA replication (<http://www.youtube.com/watch?v=NJxobgkPEAo>), and show the process of polymerase chain reaction video:

(<http://www.youtube.com/watch?v=HMC7c2T8fVk>). I would even show a light-hearted video featuring a song teaching the polymerase chain reaction:

(<http://www.youtube.com/watch?v=x5yPkxCLads>). I have learned that an idea or concept put to music is well-received by all students and quickly moved to memory.

I have also used our school's Honors Anatomy and Physiology textbook, *Principles of Anatomy and Physiology*. Tortora and Derrickson. Wiley Publishing. 2006. to teach to concepts of Cell biology.

#### Action Research Intervention

I will be implementing the Mission Biotech videogame. Moving through the levels throughout the game, students will get a chance to study different aspects of biotechnology. I plan on teaching this section near the beginning of the school year; after the general vocabulary lessons but before the systems chapter. I have made a powerpoint on cellular respiration and cellular microbiology. My lesson plan is included.

#### Connections to Bench to Bedside Summer Institute

Mission Biotech videogame was introduced to me while I was taking the Bench to Bedside Summer Institute June 20 – July 2, 2010. I believe it to fit perfectly into my anatomy lesson plans. The other classes and labs I was exposed to while at Bench to Bedside will be invaluable to me and my students to expand on the Mission Biotech lessons.

#### Data Collection and Analysis

Students will be given pre- and post standards-aligned content tests. There will also be a attitude survey geared toward careers we learned in biotechnology

#### Literature Cited:

Skloot, Rebecca. *The Immortal Life of Henrietta Lacks*. New York: Crown, 2010. Print.

"YouTube - From RNA to Protein Synthesis." *YouTube - Broadcast Yourself*. Web. 26 June 2010.

<<http://www.youtube.com/watch?v=NJxobgkPEAo>>.

"YouTube - Polymerase Chain Reaction Animated." *YouTube - Broadcast Yourself*. Web. 26 June 2010.

<<http://www.youtube.com/watch?v=HMC7c2T8fVk>>.

"YouTube - The PCR Song." *YouTube - Broadcast Yourself*. Web. 26 June 2010.

<<http://www.youtube.com/watch?v=x5yPkxCLads>>.

#### Budget and Budget Justification

Mission Biotech collaborators at University of Florida will be bringing in the videogame and will loan our school the computers needed to run the game. I will need \$200 to buy a classroom set of books. The Immortal Life of Henrietta Lacks book cost \$15.00. I would like to buy 15 books for the students to borrow if they don't have the means to buy the required reading.

#### Permissions

I will be getting permission from my principal.