

Inspiring Non-Science Students in STEM Courses: The Illustrated Novel Project

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History

- BIO 101 class (Introductory Biology)
- Illustrated novel
- Meiosis
- BIO 132 class (Human Biology)
- Full implementation of illustrated novel to all sections



Goals

- To inspire students to enjoy Human Biology
- To describe biological phenomena
- To teach students to communicate
- To address topics relevant to students

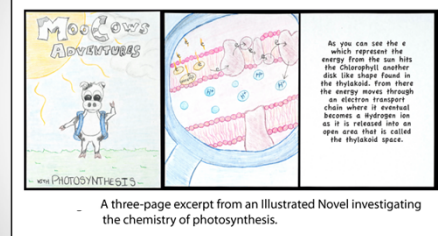
Introduction

- General education students:
 - Don't understand science
 - Scared of science
 - Cannot relate to science
- Only science course
 - Interesting
 - Relatable to their lives
 - Make it count!

Illustrated Novel

- A 15-20 page "illustrated novel"
- Graded on:
 - Effort
 - Creativity
 - Scientific depth
 - Scientific accuracy
 - Ability to communicate
- Not graded on art ability
- Incorporates a service learning component

Goal : To inspire students...



A three-page excerpt from an Illustrated Novel investigating the chemistry of photosynthesis.

to challenge themselves .

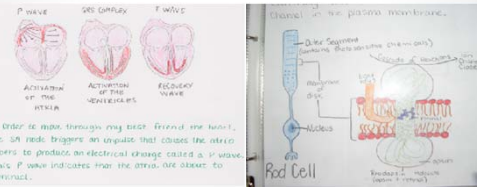
Goal: To inspire students...



Everything is going perfectly until they both decide to see the best plugging to defend himself against the might coach. Some of the kids start to get over to help him, but he tells they need to leave him behind if they want to get back to the heart in time. Reluctantly they agree, and they start their journey back to the heart without their football coach.

to express themselves

Goal : To describe biological phenomena...



In order to make through my test, I read the heart, the SA node triggers an impulse that causes the atria fibers to produce an electrical charge called a P wave. This P wave indicates that the atria are about to contract.

in detail!

Goal: To address topics relevant to students...



So, kids the party is almost over. Jess has had a little over 20 drinks in just two and a half hours. I see her cell phone there. I wonder who she was calling??? Her parents maybe? That's who she usually calls when she is in trouble.
Now her drunken friends will put her to bed.

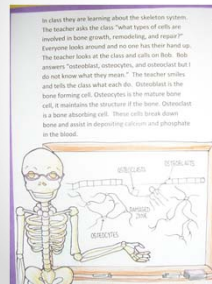
such as alcohol, tobacco and drug use

Goal: To inspire students...



to visualize cell processes

Goal : To teach students to communicate....



into a work that thoroughly explains a topic

Assessment

- Anecdotal evidence
- Pre-/post survey
 - o Attitudes towards science/biology

Results

- Pre- and post surveys administered Spring 2011

Pre-Survey Results		Post Survey Results	
Science is interesting	56%	IN made biology interesting	60%
Science is difficult	51%	IN help with studying biology	55%
Biology is interesting	51%	IN made me appreciative of biology	64%

- n= 110 (pre-survey)
- n= 80 (post-survey)

Results-Spring 2011

- Cell organelles
- Nervous system
- Blood
- Reproductive system- love story
- Cardiovascular system and pathologies
- Muscles and athletics
- Tonicity
- pH balance
- Many personal topics
 - Skin cancer
 - Atherosclerosis
 - Blood Transfusions

Future Directions

- Generate Novels (4 semesters worth)
- Service Learning Aspect
- Create an advisory committee
 - High School Teachers
- With the advisory board's leadership:
 - A. Distribute novels/proofreading paradigm
 - B. Create a website
 - C. Apply for grants
- Community of practice Fall 2011
- Attract faculty from wide range of disciplines
- Adapt illustrated novel beyond biology
- Assessment
- Guidelines
- Dissemination

Results

- **Pre-survey comments:**
- "I hope this project will help me to learn biology"
- "...become familiar with biological concepts"
- **Post-survey comments:**
- "This project really forced me to learn biology"
- "This is useful because I plan to use this project when I become a teacher"

Conclusions

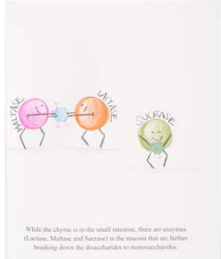
- Another learning style
- Allows students to draw on their personal strengths
- Infuse their personality while learning a scientific concept
- Student-student learning, rather than Professor-student learning
- 56% of class found science interesting (Pre-survey)

Illustrated Novel Website

- Folders for specific chapters
- A sharing resource!

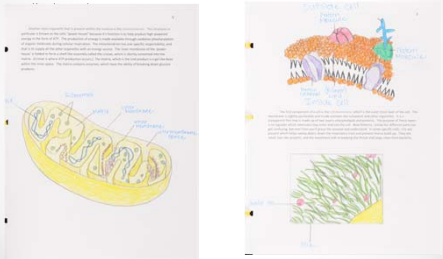
Project Samples

- Chemical Digestion



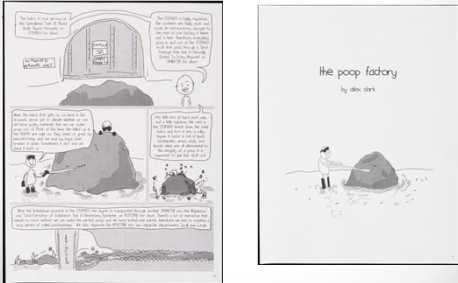
While the chyme is in the small intestine, there are enzymes (Lactase, Maltase and Sucrase) in the mucus that are further breaking down the disaccharides to monosaccharides.

Project Samples



Questions?

Project Samples



Acknowledgements

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