



Progress Energy Math, Science, and Energy Education Grant

Project Title Bloody Apples: The Mystery of the Missing iPods		Grant Category Math					
Lead Teacher Name Zachary Tullis							
Class Subject Biology		Grade Level 10/11					
School Oak Ridge High School		2011 School Grade Pending					
Phone 407-375-7151		Email Address zachary.tullis@ocps.net					
Other Project Team Members (Full Names... if any)							
Principal's Name Leigh Bradshaw				Principal's Email Address Leigh.Bradshaw@ocps.net			
Grant Application Request Amount: (example 1000) 1569.6							
Estimated Number of Participating Students 150							
2010-2011 Ethnic Distribution:	% White	% Black	% Asian	% Multi-Cultural	% American Indian/Alaska Native	% Non-Hispanic	% Hispanic
School	8	54	3	1	0	0	34

Project description (1,500 characters or less) Value - 25 points

How will the equipment/materials address your classroom needs and student needs as it relates to the grant for which you are applying (math, science or energy education).

Our school is seeking a grant to help implement a state approved course to teach biology, known as Biology Technology, to our at risk students. The course focuses on teaching students to master biology benchmarks through a combination of technology and hands on activities. The objectives for this course are: students will raise their knowledge, skills, and comfort in the expanding field of Biotechnology. This will be evidenced by an increase on standardized biology tests as well mastery of standardized techniques currently used by Biotechnology companies. To this end students will use specialized lab equipment to complete a simulated crime scene. Funding in the amount of \$ 1,569.60 is requested to purchase equipment and materials to fulfill the simulation. Students will engage in a simulated crime scene in which 10 iPods were stolen. Through the simulation students will collect evidence, run a gel electrophoresis, graph the results of the gel electrophoresis, and analyze the results. Students will start by participating in a role playing activity. During the role-play they will be introduced into the facts of the case; the suspects, motives, and evidence. From there they will work through several activities. First using a microscope they will examine fibers found at the scene. Next they will examine fingerprints. As a culminating activity they will perform a DNA gel electrophoresis, running blood samples, to determine which suspect committed the crime.

2. Project objectives (3,000 characters or less) Value - 20 points

- Explain how this project will enhance standard classroom math / science activities or energy education.
- What investigative math and/or science skills will be learned?
- What energy education lessons will be learned?
- How will it achieve academic gain for low-performing students?

A. Students are more engaged and successful when they are interacting with current technology and techniques. By simulating a crime, scene students will feel more confident and grounded as to how the topics learned in the classroom can relate to real world careers and furthering their education post high school. This proposal will enhance students' knowledge of some possible career and educational paths. It will also give them some familiarity with current techniques, giving them an edge should they decide to pursue a biotech career. Instead of reading about how DNA is manipulated, students will be involved in working with DNA. This approach can help their reading comprehension because they will have more connections from their practical experiences which will help them understand the text on DNA. B. The specific standards that are correlated with this proposal are as follows:

LA.910.2.2.3-The student will organize information to show understanding or relationships among facts, ideas, and events
 LA.910.4.2.2-The student will record information and ideas from primary and/or secondary sources accurately and coherently, noting the validity and reliability of these sources and attributing sources of information MA.912.S.1.2-Determine appropriate and consistent standards of measurement for the data to be collected in a survey or experiment MA.912.S.3.2-Collect, organizes, and analyzes data sets, determine the best format for the data and present visual SC.912.N.1.4 - Identify sources of information and assess their reliability according to the strict standards of scientific investigation SC.912.N.1.6 - Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied SC.912.L.14.6 - Explain the significance of genetic factors to health from the perspectives of both individual and public health SC.912.L.16.10 - Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues SC.912.L.16.12 - Describe how basic DNA technology is used to construct recombinant DNA molecules SC.912.L.18.1 - Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules Students will learn several biotechnology techniques. During the DNA gel electrophoresis students will learn how to use a micropipette to; load DNA into an agarose gel, how to set up and run a gel electrophoresis test, and post-test they will then learn how to stain and read the gel. D. This lesson's benchmarks are benchmarks that our students have struggled with in the past. Putting the benchmarks in a simulated case study allows students' knowledge, ability, and confidence of those benchmarks will increase. By completing actual lab techniques students will be engaged in the lesson and will experience how the benchmarks jump from abstract concepts to real life application.

3. What results or positive effects do you expect? (1,000 characters or less) Value - 25 points

Explain and quantify expected results (i.e., improved student work habits, academic gains, higher FCAT scores, improved math or science skills). Be specific.

The goal of Bloody Apples: The Mystery of the Missing iPods is to enable at-risk students and students with learning and science disabilities to improve their science skills to the point where they can succeed in school and develop the science skills that will prepare them for further high school and post-secondary education. The main objectives include: 1. Providing a measurable increase in Next Generation Sunshine State Standards (NGSSS), in science, math, and language arts. The objective is that the students will raise their abilities to the point that they will be on target to master these standards on standardized tests. 2. Enabling student's poor at science to access the NGSSS is a new, meaningful and innovative way. 3. Providing an opportunity for students to expand their awareness of careers and career options within the field of biotechnology. 4. Providing students an opportunity to use and hone 21st century skills, such as collaboration, critical thinking, and problem solving Students will be asked to collect and analysis their data, giving them an occasion to use math skills, tied to a real issue. This will increase performance in the selected math benchmarks. Finally throughout the unit students will be asked to read, interpret, and comprehend reading passages as well as technical readings. Technical reading, the ability to read technical manuals, textbooks, charts, and instructions, is a skill that our students need assistance with. By having a student centered, engaging simulation, with teacher supported activities, student ability in three different disciplines will be increased. This is directly in accordance with our schools SIP, we requires that we provide students with meaningful and rigorous experiences with our classrooms.

4. Discuss and provide timeline. (3,000 characters or less) Value - 10 points

What is your project timeline - start to finish? (NOTE: No expenditure should be referenced in timeline before notification of awards.)

Activities 1. Submit Grant Proposal August 1, 2011 2. Expected Grant Notification September, 2011 3. Obtain Equipment and Supplies December, 2011 4. Administer Pretest January, 2012 5. Student Introduction January, 2012 6. Students complete Bloody Apples lesson January, 2012 7. Administer Post Test February, 2012 8. Prepare Results Report March, 2012 9. Submit Results April, 2012

5. School Improvement Plan. (1,500 characters or less) Value - 10 points

Describe how the grant proposal relates to your SIP ([click here for current SIP](#)). Highlight the specific area of the SIP that correlates with project objectives. Specify the area of the SIP that applies to this grant. DO NOT use your School's name in any part of this grant application's narrative.

One of our school goals is to increase the number of students that pass the FCAT Reading test. In 2010 21% students scored at Level 3 or above on the FCAT Reading Test. For 2011 our goal is to increase that number to 60%. Similar goals hold true for Math and Science goals on our SIP. Our goal in 2011 is to have 70% of students to pass FCAT Math we a score a 3 or higher, this in an increase from 53% in 2010. Our goal in science is to double the number of students scoring 3 or better on state mandated testing. We want to move from 20% of students earning a 3 to 42% earning a 3. We believe that our request will help improve student performance in all three areas. The main focus is science, and the benchmarks that this unit addresses are weaknesses for our students historically. Since this unit is framed as a simulated crime science students will have opportunities to use the skills that those benchmarks address. Giving students a concrete experience in which to anchor the abstract benchmarks will increase student success on standardized testing.

Budget (10 points)

Description	Supplies	Equipment	Computer Software	Computer Hardware	Other
3 mini sub cell GT 2 Comb setups - machines used to run the gel electrophoresis	0	675	0	0	0
18 agarose gels, used to run the DNA test	135	0	0	0	0
1 class set of 10 µl micropipets	0	144	0	0	0
1 class set of 20 µl micropipets	0	144	0	0	0

