

2014-2015 Educational Grant Application

Submission Date	2014-03-27 10:52:41
Name of Grant	Amplifying Genes: Boosting Biotech Ed at AHS
Primary Contact	Lee Ferguson
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Additional Teachers/Staff who are applying for or will be working with this grant:	Tasha Mills, AHS Heidi Reese, AHS
Campus	Allen High School
Curriculum Area	Science
Grade Level(s)	11-12
Students Impacted	400
Approver Name	Shannon Watson
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Project Purpose	<p>The biological sciences influence every aspect of our daily lives. Whether it is in making decisions about what foods to consume, how to grow a home garden, or what type of medical treatment should be pursued for whatever ails us, biological principles are at the heart of each and every consumer decision we make. Because biology in the 21st century revolves around discoveries in biotechnology, there is a need for students to get exposure to practical laboratory experiences involving DNA technologies. As many of our students go on to pursue post-secondary education in the life sciences, there is a great need for them to have experiences similar to those they will have in undergraduate labs. These lab experiences include learning techniques such as DNA electrophoresis and the polymerase chain reaction (PCR).</p>
Project Description	<p>This project aims to get students engaged in the same types of investigations that professional scientists perform on a daily basis. Students in AP Biology, IB Biology and Environmental Science courses will utilize the equipment purchased with grant funds to complete investigations with biotechnology applications, all of which are performed by professional scientists and lab technicians. This includes investigating food items for the presence of genetically modified organisms (GMO's), determining evolutionary relationships of organisms, DNA barcoding of organisms to determine their evolutionary origins and relationships, and determining allele frequencies of a particular trait in a population of organisms.</p>

Allen ISD Goals/TEKS	Students will master the skills needed to design innovative solutions within independent and team settings. Students will develop critical thinking and analysis skills. Students will effectively communicate the findings of their investigations.
Measurements	Students will be assessed using the following methods: Small group poster presentations by students that allows them to communicate the results of their investigation to others. Development of infographics that provides results of investigations and how the results apply to everyday life. Production of short informational videos that explain investigation findings to others in a public service announcement format. Authoring blog posts that tie the results of investigation to current research and bioethical issues.
Teaching Methods	Students will be led through the investigation using inquiry-based learning strategies that allow students to develop their own questions for exploration. Small group instruction as well as individual instruction on lab protocols will be implemented.
Timeline for Project	The project will begin in September 2014 and run throughout the 2014-15 school year and beyond.
Curriculum/System Support	The objectives this project aims to achieve tie directly to the AISD Strategic Plan. Furthermore, the aims of this project align with the goals set forth in the AISD graduate profile. This project will involve and support the curriculum objectives of students in 4 different upper level science courses.
Additional Comments	This project will not only meet objectives in science courses, but will meet objectives found in career and technology education as well.
Instructional Supplies or Resources	This grant is being written for thermal cyclers, the machine required to perform PCR reactions. A thermal cycler replicates DNA millions of times in a short period of time. Due to the large class sizes, number of students and potential for two classes to be doing the same activity at the same time, we are requesting funds for two machines at a cost of \$3750 each, for a total of \$7500. We are also requesting one copy of a biotechnology teacher's guide published by Bio-Rad at a cost of \$120.
Supplies Budget	\$7620
Technology	Not required.
Technology Budget	0
Staff Training / Staff Development	Not required. Bio-Rad, the manufacturer of the equipment, is able to provide teacher training at no cost if necessary.
Training Budget	0
Transportation/Field Trip	None required.

Transportation Budget	0
Other	Not required.
Other Budget	0
Total Budget	\$7620
Additional Funds	We are unsure if additional funds are available. We will not be requesting funds from another source.