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JAN 31 2007

# Public Schools of Hawaii Foundation GOOD IDEA GRANT APPLICATION 2007 – 2008



**Maximum grant request (per project or teacher) is \$3,000.**

- Applicant must be a classroom teacher (or in the same bargaining unit as teachers) in a Hawaii public school during the 2007-2008 school year. A team of teachers from the same school may apply, but one teacher on the team must be designated as the team leader/contact.
- Equipment purchases are allowed, but are limited to no more than 50% of the total amount of the grant request and must be an integral part of the grant project. The Foundation defines "equipment" as audio-visual or computer equipment that has a unit cost of \$250 or more and has a general life expectancy of one year or more.
- Grant applications that are in consonance with the Department of Education's focus areas (academic achievement/literacy; safety and well-being; civic responsibility) will be given priority consideration.
- Grant requests will NOT be considered for: travel, e.g., air or ground transportation; in-service training; hiring of consultants, substitutes, or positions; t-shirts, parties, or reward-type items; and other items generally provided by the State.

**APPLICATION MUST BE POSTMARKED BY Wednesday, January 31, 2007  
or received by email no later than 12:00 midnight on January 31, 2007.**

Name of applicant (or team leader): Mr./ X Ms. Marlene Stark  
First Name Last Name

Home Address: \_\_\_\_\_  
City, State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Home Phone Number: \_\_\_\_\_

Summer contact information (if different from above):

Street Address: same as above  
City, State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Phone Number: \_\_\_\_\_

Email address: marlene\_stark@notes.k12.hi.us  
Position at school: Biology/Chemistry teacher

School: Kapolei High School Complex Area: Campbell-Kapolei-Waianae  
School Address: 91-5007 Kapolei Parkway  
City, State: Kapolei, HI Zip Code: 96707  
School Phone No. 808-692-8200 ext. 3351

If more than one person is applying, list names of team members and their positions:

Project Title (5 words or less): Forensic Science for High School

Participants:  
No. of students: 90 Grade level(s): 11<sup>th</sup>-12<sup>th</sup> Grade Subject Area(s): Integrated Science Curriculum focusing on applications of science through the Forensic Science field. Integration will also include Social Studies and Language Arts standards as part of the curriculum.

**Public Schools of Hawaii Foundation**  
**GOOD IDEA GRANT APPLICATION 2007 – 2008**

**3. Specific objectives:**

Students will explore the application of basic principles of chemistry, physics and biotechnology through real world application in the field of forensic science. Students will engage in active learning by hands on experience from laboratory exposure to crime scene evidence collection and processing. Students will complete the project by conducting a mock trial which will present the results of their investigations. Specific objectives include the following:

- Students will research a forensic career of their choice and present their research to the class using Power Point or another visual display. Grading emphasis will be on content, accuracy and presentation skills. Additionally, students will interview a professional in the field and turn in a typewritten paper regarding the results of their interview.
- Students will properly observe, photograph and document a crime scene, following the rules regarding chain of custody with students achieving an 85% or higher accuracy rating.
- Students will process evidence from a crime scene using techniques learned from laboratory practice. Students will be able to establish and document a chain of evidence from the crime scene with 95% or higher accuracy.
- Students will process and analyze DNA patterns and correctly identify the perpetrator of the crime in 100% of the cases.
- Students will prepare a case for trial. Students will present a mock trial which will be assessed for preparation and presentation of the case. Students will also be evaluating their peers during the trial as part of a jury.
- The following standards will be addressed.

**Science Content and Performance Standard (HCPS III)**

**Standard 1: The Scientific Process: SCIENTIFIC INVESTIGATION-Discover, Invent, and Investigate using the skills necessary to engage in the scientific process**

**Topic: Scientific Inquiry**

**Students will be able to:**

Describe how a testable hypothesis may need to be revised to guide a scientific investigation,  
Design and safely implement an experiment, including the appropriate use of tools and techniques to organize, analyze, and validate data,  
Defend and support conclusions, explanations, and arguments based on logic, scientific knowledge, and evidence from data,  
Determine the connection(s) among hypotheses, scientific evidence, and conclusions,  
Communicate the components of a scientific investigation, using appropriate techniques,  
Engage in and explain the importance of peer review in science.

**Topic: Scientific Knowledge**

**Students will be able to:**

Revise, as needed, conclusions and explanations based on new evidence,  
Describe the importance of ethics and integrity in scientific investigation,  
Explain how scientific explanations must meet a set of established criteria to be considered valid.

**Standard 2: The Scientific Process: NATURE OF SCIENCE: Understand that science, technology, and society are interrelated**

**Topic: Science, Technology, and Society**

**Students will be able to:**

Explain how scientific advancements and emerging technology have influenced society,  
Compare the risks and benefits of potential solutions to technological issues.

**Social Studies Content and Performance Standard (HCPS III)**

**Standard 5: Political Science/Civics: PARTICIPATION AND CITIZENSHIP – Understand roles, rights (personal, economic, political), and responsibilities of American citizens and exercise them in civic action**

**Topic: Rights and Responsibilities of Citizens**

**Students will be able to:**

Explain the rights, duties, and responsibilities of citizens in a democracy and the relationship between them.

### Language Arts Content and Performance Standard (HCPS III)

**Standard 7: Oral Communication: RHETORIC: Adapt messages appropriately to address audience, purpose and situation**

**Topic: Meaning**

**Students will be able to:**

Use relevant evidence and rhetorical devices to advocate and defend a position.

**Topic: Design**

**Students will be able to:**

Organize points so as to lead the audience to seriously consider an argument or stance.

#### 4. Project Description:

Briefly describe

- a) how the project will address the Department of Education's student priorities (achievement/literacy, safety and well-being, civic responsibility) and will help students meet state standards;
  - b) what is new and/or innovative about the project;
  - c) the major activities that will be conducted to implement this project and to meet project objectives.
  - d) how proposed budget items will be used to support project activities.
- 
- a) Forensic Science in High School is a pilot year long course designed to introduce students to the scientific, legal and historical perspective of crime scene evidence collection and analysis. By conducting research and hands-on investigation, students will be addressing standards from three different content areas and will be using the six general learner outcomes (self-directed learner, community contributor, complex thinker, quality producer, effective communicator and effective and ethical use of technology) in order to be successful during this project. The final mock trial assignment encourages students to be responsible citizens within their community while students are actively participating in and observing the final conclusion of their work.
  - b) This particular course is a pilot program within the school system. While many high schools on the mainland have had this course for several years as part of their curriculum, forensic science was only recently approved as a pilot course for Hawaii schools. The application of science increases student motivation by focusing on how laboratory experiments are relevant in the real world. Forensic Science also provides a unique opportunity to integrate science with social issues. Both the National Science Teachers Association and the American Academy of Forensic Science have reported "a surge in interest among students," in forensic science due to such shows as "C.S.I." This course is designed to capitalize on students' interest in the subject and to promote their interest in science as a possible career.
  - c) The major activities that students will be conducting during the course include: researching careers in forensic science and presenting research results to their peers, interviewing professionals from fields in forensic science and submitting a written report, documenting, investigating and processing evidence from different crime scenes, observing and hypothesizing from evidence, classifying data and creating reference charts to aid in the identification of evidence, and preparing a case for a mock trial.
  - d) The proposed budget items are requested to help with establishment of this pilot program. Textbooks are requested to encourage students to develop their reading skills and to provide a reference source for their investigations. A test generator from the book publisher is requested to help assess student performance. Digital still cameras are requested to document crime scenes and to provide photographic evidence which will be used for assessment and in the mock trial. The remaining items requested are used in direct laboratory experimentation as students investigate the crimes. A DNA typing kit (along with a mini-pipettor kit and gel electrophoresis system) is requested to help with the processing and classification of DNA from crime scenes and to introduce students to technology currently in use in science. A questioned documents forgery kit contains thin layer chromatography which is used to identify inks as well as chemicals during investigations. Luminol is used to check for blood which is not apparent to the naked eye. The latent fingerprint kit is used to dust for and identify fingerprints.

**5. Evaluation:**

How you will determine whether your project is successful and your objectives have been met.

- Rubrics will be developed and created collaboratively with professionals from the community, such as HPD. These rubrics will be used to evaluate presentations and investigative techniques.
- Students will determine at the beginning of the course what goals they would like to achieve during the course and keep a chart to record and evaluate their progress toward their goals.
- Students will be assessing their peers during research projects and during the mock trial. Students will work together to brainstorm ideas for evaluation criteria of their peers during team projects.
- Students will be creating a portfolio of work which will contain the results from experiments as well as reference material from the course.
- An initial assessment or pretest will be utilized to determine the initial level of skill for each student. Formative assessment will be conducted during the course to evaluate their progress. Formative assessment can take the form of verbal checks for understanding as well as written lab assignments.
- A final post-test will be conducted to determine the final outcome and skill level for each student. The final assessment will be compared with the initial to determine the progress or lack of progress for each student.
- Students will complete a final evaluation of the course to determine the effectiveness as well as make constructive suggestions for improvement.

**6. Project Budget:**

Proposed items should enable you to meet project objectives and carry out proposed activities. Provide specific information about the quantity and kinds of items to be purchased, where items will be purchased, tax and shipping/handling if applicable, and cost (See table below). Note: If this grant is approved, applicant will be requested to furnish PSHF with an accurate accounting of all funds used and a completed evaluation form at the end of the project.

Item Description	Store/Source	Quantity	Unit Cost	Subtotal
Forensic Science for High School Textbooks	Kendall/Hunt Publishing Company	30	\$60	\$1800
Forensic Science for High School Teacher Edition with Teacher resource CD	Kendall/Hunt Publishing Company	1	\$110	\$110
Forensic Science for High School Test Generator	Kendall/Hunt Publishing Company	1	\$130	\$130
Sony Cyber-Shot DSC 5500 Digital Camera	Circuit City	2	\$150	\$300
Sony 1 GB Memory Stick Pro Duo (MSX-M1GS)	Circuit City	2	\$45	\$90
DNA Typing Kit	Vandalia Science Education	1	\$150	\$150
10 <i>ul</i> Mini-Volume Pipettor Kit	Vandalia Science Education	1	\$80	\$80
Questioned Documents Forgery Kit	Vandalia Science Education	1	\$130	\$130
Electrophoresis System II-Analyzing DNA Biotechnology Kit	Fisher-Scientific	1	\$140	\$140
Latent Fingerprint Kit	<a href="http://www.crimescene.com">www.crimescene.com</a>	1	\$40	\$40
Luminol	<a href="http://www.crimescene.com">www.crimescene.com</a>	1	\$30	\$30
SUBTOTAL OF EQUIPMENT COSTS: (Must be ≤50% OF TOTAL REQUEST)				\$390
TOTAL REQUEST: (Maximum=\$3000)				\$3000.

JUN 27 2008

Public Schools of Hawaii Foundation  
Good Idea Grant Evaluation  
2007-2008

Name: Marlene L. Stark

Position: Science Teacher School: Kapolei High School District: Leeward

Project Title: Forensic Science in High School

Amount Funded: \$3000.00 No. of Students: 90

1. State your project objectives as indicated in your project request.

Students will explore the application of basic principles of chemistry, physics and biotechnology through real world application in the field of forensic science. Students will engage in active learning by hands on experience from laboratory exposure to crime scene evidence collection and processing. Students will complete the project by conducting a mock trial which will present the results of their investigations. Specific objectives include the following:

1. Students will research a forensic career or their choice and present their research to the class using Power Point or another visual display. Grading emphasis will be on content, accuracy and presentation skills. Additionally, students will interview a professional in the field and turn in a typewritten paper regarding the results of their interview.
2. Students will properly observe, photograph and document a crime scene, following the rules regarding chain of custody with students achieving an 85% or higher accuracy rating.
3. Students will process evidence from a crime scene using techniques learned from laboratory practice. Students will be able to establish and document a chain of evidence from the crime scene with 95% or higher accuracy.
4. Students will process and analyze DNA patterns and correctly identify the perpetrator of the crime in 100% of the cases.
5. Students will prepare a case for trial. Students will present a mock trial which will be assessed for preparation and presentation of the case. Students will also be evaluating their peers during the trial as part of a jury.

2. Were your objectives met or not? Please describe.

All objectives were met. Details for each objective are as follows:

1. Students formed groups and after a week of research, created Power Point presentations to inform the class about the career they had selected to research. Students selected various careers including forensic anthropology, criminal lawyer, medical examiners or coroner, crime scene investigators and criminal profilers. Part of this particular objective was modified because during the course of the school year, guest speakers from various fields such as Honolulu Police Department's traffic investigators, Joint Pacific Command's forensic anthropologist and Honolulu Police Department's ballistics expert gave lectures for the students. After the lectures, students would fill out a reflection form to detail what they had learned from the presentation. All students, or 100% presented during this project.
2. Students had one initial crime scene to practice on and then, during the course of the year, they had 2 more crime scenes that were evaluated. The final crime scene was followed through to the mock trial. Students formed groups to photograph, collect evidence and to investigate potential witnesses and suspects. This particular part of the course engaged students' attention and 95% of students were able to accurately process the crime scenes.
3. Students were able to follow the chain of evidence from crime scene to lab. The second crime scene was an outdoor crime scene so students had to transport evidence, after carefully documentation, back to the lab. Students were able to establish and document the chain of evidence with a 95% or higher accuracy rating.
4. Students prepared gels to analyze DNA patterns. The battery operated electrophoresis kit did not provide definitive gel bands because of the low voltage level (only a 9 volt battery). Lab fees funds were therefore used to purchase electric operated gel electrophoresis equipment, which could generate 100 volts. With this particular equipment, students were able to, after 4 trial gel runs, correctly identify the perpetrator of the crime based on the DNA gel band pattern.
5. Students prepared and presented the second crime scene at a mock trial that was presented in the downtown classroom courtroom. This particular mock trial was recorded by the students. The mock trial was run by the students who formed trial teams, jury

members, expert witnesses as well as the judge. After the trial, students completed a mock trial reflection paper to detail their experience and what they learned about the trial process and the role forensic science has at a trial. 95% of students turned in a final reflection and evaluation.

3. Will this project be continued or not? Please check where applicable and provide an explanation for your response.

will be continued  
 will be continued with modifications  
 will not be continued

This particular course proved to be very engaging for the students and will be continued at this high school. At least three classes have already been filled for next year (90 students), so the course will be ongoing. The only modifications will involve adding another field trip to Chaminade University to view their forensic science program. Also, other labs may be added to include analysis of glass fragments and an additional chemical analysis lab.

4. Can your project/idea be applied at other schools?

Yes, this particular project/idea has been shown to interest students in the field of science. Students are able to see the connection between science and the real world. At this time, Maui High School currently has this course and the course is being implemented at other high schools, such as Waianae High School on the island of Oahu.

5. How did you hear about this grant program?

A workshop was held during Teacher Institute Day in October of 2006. After this workshop, I learned how to apply for this grant.

6. Why did you apply to the Public Schools of Hawaii Foundation for a Good Idea Grant?

Setting up a new course at the high school involves a large expenditure up front. Applying for this grant, I wanted to help offset the initial cost of starting up a new course, plus I wanted to be able to purchase materials and supplies for students to have. Without this grant, those materials and supplies would have taken several years to fund. It was important for the students to have some initial materials to work with in order to engage their interest in the subject.

7. Provide an expenditure report using the project budget you initially proposed and attach all receipts (see attached form).

8. Do you have any suggestions on improving the grant making process?

My only suggestion would be to have an online application for the grant.

Date due: **June 30, 2008**  
Mail to: Public Schools of Hawaii Foundation  
P.O. Box 4148  
Honolulu, HI 96812