

Ramkissoon- Mosquito Control and Prevention of Vector Borne Diseases in South Florida: A School-wide project

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Vamini Ramkissoon
Coconut Creek High School

Abstract: Vector Borne diseases, in particular those transmitted by mosquitoes, are responsible for the death of millions of people worldwide. In Florida, there have been increasing reports of vector borne diseases that have been detrimental to animals and humans. In recent years, there has been widespread media coverage of West Nile Virus and a less announced outbreak of Rift Valley Fever in Central Florida. At present, the state is becoming aware of an endemic of Dengue fever in the Florida Keys and the question of the impending spread to the widely urban areas of Dade and Broward County looms at large. This project will span most of the 2010-2011 school year and will incorporate and assess various elements of mosquito control. The objective is to heighten student awareness of their environment (in the case of vector-borne diseases) and involve them in the prevention aspect of public health and disease control.

Rational: Florida enjoys a tropical environment that also provides a suitable breeding ground for various species of mosquitoes. Over the past few years, the spread of vector borne diseases has increased in the United States. It is alarming that many students do not know that malaria, a vector borne disease, is one of the leading causes of death in the world. In this project, I propose to provide students with a better understanding of the global impact of vector-borne diseases (utilizing the maps from Dr. Tatem), to make them aware of the recent outbreaks in the United States due to insect carriers, and have them devise and test strategies to control mosquitoes in and around their homes and school environment (as mentioned in Dr. Connelly's lecture). In addition, the recent Dengue endemic in the South Florida Keys can quickly spread to the more urbanized cities of Miami and Fort Lauderdale since a similar vector species is also found in these areas. Students will learn how quickly viruses can spread through a population and how they can topple a country's public health system if not dealt with rapidly (drawing from

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the Gibbs lecture). Finally, I hope to make students more aware that the world they live in is now a global family in which borders are not clearly defined as they once were. They will understand that as a part of this larger family, they must play their part in their own environment, to contribute to the greater well being of the human population.

Description of teaching unit or module(s), including expected outcomes: (see attached lesson plan)

Data collection techniques and/or student assessments: Data collection and Assessments (formal and informal) will be conducted at various points in the project (see lesson plan).

ICORE summer institute elements specifically included (UF connections): Dr. Roxanne Connelly's lecture: *Insect-vectors and Florida's Public Health*, Dr. Andy Tatem's presentation (maps), Dr. Paul Gibbs' presentation: *Rift Valley Fever*, Classroom extensions using Dr. Charles Lawrence's immunoassay kits. An ongoing collaboration with the ICORE team may be necessary as the project progresses.

Literature Cited

Knudsen, A.B., Slooff, R. Vector-borne disease problems in rapid urbanization: new approaches to vector control. *Bull World Health Organ.* 1992; 70(1): 1–6.

PMCID: PMC2393336

Budget and budget justification:

In addition to the \$200 micro grant, the majority of the cost will be in the advertisement part of the project. Poster boards, markers, paints, and other artistic tools will be needed to complete the advertisement. Because the project is a school-based to community project, a field trip may be included in it, hence increasing the cost but not significantly.

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Time	Procedures Followed:	Materials/Text References
52 Minutes	Introduction to research methods and data collection. Students will create a log to document all experimental data. They will understand the importance of having and maintaining a notebook from which they can share data and collaborate	
2 days	Mini field trip to assess the amount of trash lying around the school and to find possible mosquito breeding places. -Students will examine samples of water collected for mosquito eggs and larvae -Students will be able to make the connection between trash that is not disposed of properly and mosquito breeding	
	Statement of Objectives: Students will become aware of vector-borne diseases and their impact on the world as well as the United States and their local communities. They will use scientific experimentation to devise a plan to limit the areas of mosquito breeding around their homes and the school campus. They will be able to develop an advertisement based on sound scientific research to share with their peers and school mates.	
52 <hr/> Minutes	Presentation of New Material: Class activity on vector borne diseases and the impact on the world.	Flipchart notes
3-52 <hr/> Minute sessions	Guided Practices with Corrective Feedback: Lab on immunoassay and testing for a viral infection Collection of water in containers around campus and the home (assess student understanding of proper lab technique here)	
<hr/>	Assign Independent Practice with Corrective Feedback: Log and student notebook (used for assessment).	

Teacher: Vamini Ramkissoon

School: Coconut Creek High School
"Where Learning Comes First"

Subject: Research methods class

Dates: Semester:

Blocks:

Standard(s) / Objective Met: SC.H.3.4.3: **The student understands that science, technology, and society are interwoven and interdependent.** knows that scientists can bring information, insights, and analytical skills to matters of public concern and help people understand the possible causes and effects of events.
4. knows that funds for science research come from federal government agencies, industry, and private foundations and that this funding often influences the areas of discovery.

Homework Given:

Research and plot areas of the world that have had severe outbreaks of mosquito borne viruses. Include the number of fatalities and the names of the viruses/diseases that ensued in each area. (beginning days homework)

Students will engage in:

- Independent Activities Think-Share-Pair Technology Integration
- Small Group Instruction Cooperative Learning Whole Group Instruction
- Other _____ Other _____ Other _____

CRISS/Cougar Strategies:

- Learning Log One-Sentence Summary Reciprocal Teaching Reading Log
- Column Notes Questioning Word Quest Frayer Model Graphic Organizers
- Other Other Other_ Other Other

ESOL Modifications:

- Buddy System One-on-One Extended Time
- Modified Lesson Visual Stimulation Realia

Other _____

Other _____

ESE Modifications:

ESE students will sit at the front of the class, interact positively and constructively with other classmates and practice reading aloud in class.

Teacher Notes/Backward Planning/What Do You Want the Students to Know: At the end of this project, students will understand that vector borne diseases are a reality and mosquitoes are carriers of some of the world's most deadly diseases. They will be able to use scientific understanding to carry out an investigation and come up with solutions and recommendations for a program to limit the number of mosquitoes around their school campus and around their homes.

Present Closure/End with a Review:

52

Minutes

Class presentations of posters and turn in completed reports, notebooks.