

**Title: Help—I'm Being Eaten Alive**

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**Abstract:**

This action plan will allow students to act as epidemiologic zoonotic researchers. This is designed to introduce bloodsucking arthropods through analysis of differential anatomy/physiology and the pathology of their impact on other animals, primarily humans. The students will study this from a public health perspective. By examining the life cycle of mosquitoes they will be able to understand public health prediction of mosquito outbreaks and population curves within geographic occurrences. Students will be able to express the cause and effect relationship to public health threat through GIS technology and government websites.

Students will research the pathology of disease from contact with blood sucking arthropods, from a full medical protocol beginning with etiology, signs and symptoms, diagnostics, treatment, complicating factors, morbidity, mortality and prevention. Students will be prepared to perform public health outreach by creating a public health brochure on a specific blood sucking arthropod.

**Rationale:**

Students will have the opportunity to study vector borne diseases in geographical area of personal interest. A majority of the Fort Lauderdale High School (FLHS) are from the Caribbean. Many of the students are from adjacent islands to south Florida, as well as south Florida, exposure to many of these arthropods is an everyday occurrence. These arthropods have an impact on quality of life most months of the year and interfere with outdoor activities, sports, and jobs. Many students have not been able to have family members present for viewing participation in sporting events because sitting outdoors meant "Being eaten alive" by bloodsucking arthropods. Most individuals in south Florida have no alternative and are forced to interact with these vectors.

This unit will empower students with an understanding of the chain of events that increases the prevalence of these vectors, the possible health impacts, and teaches proactive methods that may assist the community in safety and quality of life.

**Timeline Overview:**

This will be approximately a four week unit.

Opening hook- Speaker from Extension Service  
The mosquito life cycle is a three week process.  
Dot Blot Lab one day  
Research and arthropod data collection with photography--- three week  
Trifold brochure development---two weeks

**Student Outcomes:**

Students will be able to predict arthropod vector outbreaks

Students will understand the medical protocol for arthropod vector diseases

Students will produce a public health brochure on a specific bloodsucking arthropod

**Standards:**

NGSSS Science Research

Level 2-Basic application of skills and concepts

Level 3-Strategic thinking and complex reasoning

SC.912.N.1.4—level 3

Identify sources of information and assess reliability according to strict scientific standards

SC.912.N.1.5---level 2

Describe and provide examples of how investigations conducted in many parts of the world result in the same outcome

SC.912.N.1.6---level 2

Describe how scientific inferences are drawn from scientific observations and provide examples from content being studied

SC.912.N.2.1---level 3

Identify what is science and what is not and what superficially resembles science but fails to meet criteria for science

SC.912.N.2.2---level 3

Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing such as art.

**Lessons:****Students will:**

Day 1—Extension Service speaker—Hook to engage students

Day 2---Begin mosquito life cycle using mosquito breeders

Days 3-5---students on laptops--to government weather mapping-

*Weather.IFAS.gov and CDC.gov*

*Disease Maps.USGS.gov and CDC.gov*

*Mosquito.IFAS.edu and CDC.gov*

*Students will create a graph displaying any relationship between mosquito populations, wet and dry weather and mosquito borne disease outbreak*

Week 2—Lab report-due Tuesday

Mosquito predictions complete

Students will review history and make 30 day predictions on mosquito outbreaks

Students receive individual bloodsucking arthropod for medical research

Laptop research using protocol

Week 3---Tuesday-Dot Blot Lab-Materials from ICORE locker

Students produce arthropod photography for their brochure

Brochure creation and layout production

Week 4---Monday-Student brochure review

Tuesday and Wednesday—Final revisions

Brochure completion—print ready

Presentation, discussions and delivered to printer for publication

**Data Collection Techniques:**

Student observation data sheets  
 Student lab reports  
 Independent research  
 Student photography  
 Brochure production  
 Student presentation

**Use of Equipment Lockers/Field Trip to UF:**

Dot Blot kits  
 Mounted Arthropods samples

**Connections to ICORE Summer Institute:**

Dr. Roxanne Connelly---Mosquito identification and-Mosquito-borne pathogens  
 Dr. Phil Kaufman—Ticks-life cycle, pathology and identification  
 Julie Bokor—ELISA for Dengue Fever  
 Dr. Houda Darwiche---Dot Blot-to use Dengue Fever Scenario

**Improvement on Traditional Teaching Techniques:**

This is an curriculum expansion of the Public Health Honors course. This is a new important focus area that is relevant and rigorous. If this had been taught in the past, it would have been just a power point lecture strictly from the focus of pathology and signs and symptoms for disease recognition. Students would not have had any of the technology interactions. ICORE has provided me with the enrichment and reality that students will experience. ICORE has changed this from a lecture to an actual learning unit.

**Budget and Budget Justification:**

Breeders for life cycles  
 Posters for arthropod reference-1 poster for 5 students  
 Printer cartridges for final printing submission  
 Invisible ink for Dot Blot Lab

Item	Cost	Vendor
12 mosquito breeders	\$9.45 each=\$113.40	
8 Bloodsucking Arthropods posters	\$4.95 each=\$39.60	IFAS extension book store
1 color printer cartridges	\$24.49	Office Depot
1 black printer cartridges	\$20.49	Office Depot
3 Invisible ink RSINVP3	\$2.49=\$7.49	Blacklight.com

**Literature Cited:**

Kay Tomashek (2011). Dengue Fever and Dengue Hemorrhagic Fever  
[www.cdc.gov/dengue/travelOutbreaks/index.html](http://www.cdc.gov/dengue/travelOutbreaks/index.html)

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