

Mosquito: Infecting the Population with West Nile Virus

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Abstract

We are living in a world full of increasing technology to make life more efficient and exciting. However, we are living in a world full of competition for species survival. There are thousands of microscopic life forms that need hosts such as humans and domestic animals to procure their lives. This is becoming a problem that could result in huge ramifications not only with health issues but also economic issues. The population of people needs to be educated about these unknown dangers so precautions and solutions may be found.

Mission Statement

To coexist with the mosquito will be challenging to health of humankind and animals. Many emerging pathogens are threatening to establish itself in our bodies with serious consequences to our health and impacting social and global economics. I will educate students and the community about West Nile Virus and actively engage students in responsible activity of prevention and eradication.

Description

The teacher will establish the following criteria for students:

1. The student will identify the life cycle of the mosquito, environments of the mosquito, and characteristics of host's and vector's
2. The student will understand the pathogen causing West Nile. Positive identification of the pathogen will be confirmed with biotechnology.
3. The student will apply new knowledge into applications of research and debate to pursue possible solutions of eliminating this pathogen.

The student will engage in these objectives by:

1. Identifying the life cycle of the mosquito with prepared slides, research the environment along with illustrations, and describe the anatomy of the mosquito.
2. Simulation blood test of birds, horses and humans will identify antibodies of the virus with an ELISA test.
3. Research will be conducted in the computer lab to seek solutions to eradicating the vector or controlling the vector. A debate will be held in class for an expanded practice of critical thinking. A governing board will evaluate both sides of the presentation for consensuses.

Experience

Animal Medical Technology Degree which allowed me to work with Veterinarians for seven years.

Biology/Chemistry Degree

Master's Degree in Education/Biology

Six years as an Educator

Literature Cited

Professors at the HHMI ICORE Summer Institute

Ponds, Puddles & People, Lee County Mosquito District

Environmental Science, Holt, Rinehart and Winston, 2000 Austin, TX

Budget and budget justification

Class set of mosquito life cycle slides Ward's Natural Science catalog	11.50 x 10 = 115.00
Class set of mosquito anatomy Ward's Natural Science catalog	6.56 x 10 = 65.60
Paper for copies of handouts	19.40
Total	<hr/> \$200.00

**Mosquito and West Nile Virus
Lesson Plan**

Lesson Plan Ia: Mosquito

Objectives: the student will

1. identify life cycle, anatomy, and habitat.
2. calculate reproductive potential.
3. cause and effect on public health.

Lesson Plan Ib: West Nile Virus

Objectives: the student will

1. identify life cycle of a virus.
2. describe the anatomy of the virus.
3. describe the life cycle of the West Nile Virus including the hosts and vectors.
4. define Emerging Pathogen.
5. assimilate the origin of the West Nile Virus in the United States.
6. discuss the consequences of this disease in Florida.
7. discuss ways of preventing the spread of the disease.

Lesson Plan II: Biotechnology

Objectives: the student will

1. define biotechnology
2. apply biotechnology techniques to identify the West Nile Virus

Lesson Plan III: Critical Thinking

Objective: the student will apply his/her knowledge of the West Nile Virus and the possible results of this epidemic to debate possible solutions in resolving the threat to the population.

Standards which are met in this unit:

SC.H.1.4.1
SC.H.2.4.2
SC.H.2.4.2
SC.H.3.4.2
SC.H.1.4.7
SC.H.3.4.3
SC.H.3.4.5
SC.H.3.4.6
SC.F.1.4.8
SC.F.1.4.7
SC.F.2.4.3

**Mosquito and the West Nile Virus
Pretest**

1. The proper order of the stages of growth in complete metamorphosis is:
a. Egg, pupa, nymph, adult c. egg, larva, pupa, adult
b. Egg, nymph, adult d. larva, pupa, adult
2. Which of the following is not an insect
a. Spider c. grasshopper
b. Mosquito d. ant
3. The hard outer covering of an insect is called the:
a. Endoskeleton c. ectoskeleton
b. Exoskeleton d. molt
4. Controlling insect pests with natural enemies is an example of:
a. Biological control c. mechanical control
b. Chemical control d. inventive control

True or False

Please circle T if the statement is true or F if the statement is false.

5. By emptying containers around your house that are holding water, you may help reduce the amount of spraying needed for mosquito control and, therefore, help to protect the environment.
 T F
6. A virus must use a living cell in order to reproduce.
 T F
7. A vector carries a pathogen that may cause a disease.
 T F
8. Mosquitoes must have water to develop properly.
 T F
9. A human cannot contract West Nile Virus.
 T F
10. West Nile Virus can only be spread by direct contact.
 T F

Putting It into Perspective
Reproductive potential of one female mosquito

One female mosquito lays 200 eggs per batch. Approximately 50% of the eggs survive, and the ratio is 50% male and 50% female. Some mosquito species in Florida can go through one generation in as few as 7 days.

Goal:

Calculate number of eggs laid, number of survivors, and number of females produced in 4 generations. At the end of approximately one month, under perfect conditions, how many female mosquitoes will there be?

Generation 1. $F=200$ eggs= 100 survivors= 50 females

Generation 2. $F=50$ females \times 200 eggs each = 10,000 eggs = 5,000 survivors = 2,500 females

Generation 3. 2,500 females \times 200 eggs each = _____ eggs = 250,000 survivors = _____ females

Generation 4. _____ females \times 200 eggs each = _____ eggs = _____ survivors = _____ females.

How many females would you have if you started with 20 females at the beginning of the month?