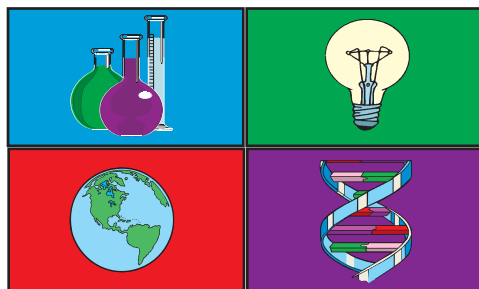


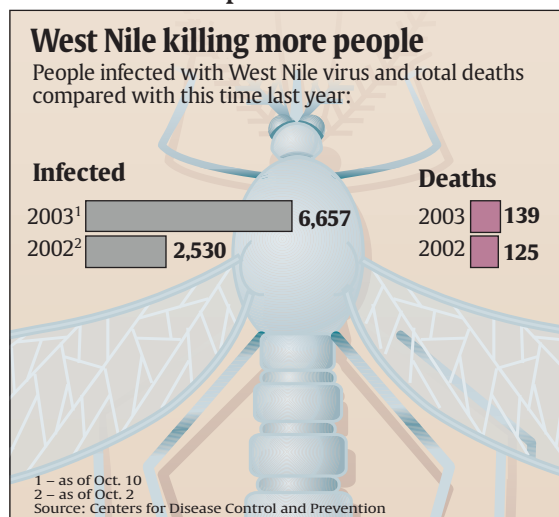
# Science TODAY™ Teacher Edition



## West Nile killing more people

By: Jeff Lukens

### USA TODAY Snapshots



By Shannon Reilly and Dave Merrill, USA TODAY

### Activity Overview:

After studying the USA TODAY Snapshot™ "West Nile killing more people," students will compare the number of West Nile cases in the United States over the past three years. From the data, percent increases and decreases from year to year will be calculated. In addition, students will calculate the percentage of West Nile cases that resulted in the deaths of the victims from one year to the next. Finally, three selected states' data will be examined, and conclusions will be made regarding the trend in the cases of West Nile disease.

### Concepts:

- Emerging diseases
- Disease prevention
- Vectors for pathogens

### Activity at a Glance:

- Grade level: 9-12
- Subject: Biology, Health
- Estimated time required: 30-40 minutes

### Materials:

- TI-83 Plus family or TI-84 Plus family
- Calculator for instruction/demonstration
- Student handout
- Transparency
- TI-Navigator™ Learning System (if available)
- USA TODAY Newspapers (recommended)

### Prerequisites:

Students should be able to:

- calculate a percentage using a graphing calculator.
- calculate percent change using a graphing calculator.
- navigate a website.



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This activity was created for use with  
Texas Instruments handheld technology.

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### Objectives:

Students will:

- examine the trend in the spread of West Nile virus in the United States.
- calculate percent change in the occurrence of infection.
- calculate the percentage of West Nile victims who die from the disease.
- make predictions about how selected states are coping with West Nile virus.

### Background:

Emerging diseases are a hot issue in our world today. It seems every year there is a new viral or bacterial threat. In recent years, the West Nile virus has burst on the U.S. scene and brought with it tremendous public concern, changes in public policy, and an increased awareness of environmental hazards. States and communities have put forth an aggressive effort to control the "vector" of this disease—the mosquito. The West Nile virus is carried in the blood of warm-blooded animals (birds and mammals), and is thought to be transmittable from one organism to another. The means of this transmission is one or more species of mosquito. Consequently, resources are being devoted to controlling mosquitoes, and educating people on reducing the risks of infection. This activity will examine some details of the virus.

### Preparation:

- Provide one graphing calculator for each student.
- Each student should have a copy of the corresponding student activity sheet.

### Classroom Management Tips:

- Students will have a better understanding of how to read the graphic and retrieve data if you use the transparency for a class discussion before the students start working.
- Remind students to read carefully all parts of the graphic before they start collecting data.
- Students can work individually or in small groups on this activity. Working in groups is especially helpful as they learn the various features of the calculator.

### Data Source:

Centers for Disease Control and Prevention

### National Science Education Standards:

#### Grades 9-12: Personal and Community Health

- Hazards and the potential for accidents exist. Regardless of the environment, the possibility of injury, illness, disability or death may be present. Humans have a variety of mechanisms—sensory, motor, emotional, social, and technological—that can reduce and modify hazards. The severity of disease symptoms is dependent on many factors, such as human resistance and the virulence of the disease-producing organism. Many diseases can be prevented, controlled, or cured. Some diseases, such as cancer, result from specific body dysfunctions and cannot be transmitted.

### Additional Resources:

- TI Technology Guide, for information on the following:  
Calculating percentages and percent change on the home screen of the calculator
- TI Navigator™ Basic Skills Guide for information on using the TI-Navigator Classroom Learning System

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### Activity Extension:

- USA TODAY often has articles about West Nile and other diseases. Ask students to read USA TODAY for updates and more information, data and graphics.
- The Centers for Disease Control website ([www.cdc.gov/ncidod/dvbid/westnile/](http://www.cdc.gov/ncidod/dvbid/westnile/)) has excellent information on West Nile. Have students access the website to research the means of transmission of the virus.
- "Vectors" are common transmitters of disease. Instruct students to discuss other diseases that have vectors, and describe their means of transmission. Some possibilities include HIV, malaria, Lyme disease, bubonic plague, and African sleeping sickness.
- Controlling the vector often controls the disease. Encourage students to research how states like Pennsylvania and Nebraska have coped with West Nile, because the prevention methods appear to be working.
- This would be a great opportunity to introduce or revisit the topics of symbiosis and parasitism.
- Direct students to find articles in USA TODAY about the West Nile Virus or other emerging diseases

### Curriculum Connections:

- Advanced/AP Biology
- Ecology/Environmental Science
- Statistics

### Teacher Notes:

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### Assessment and Evaluation:

**Q. By what percent did the number of West Nile cases increase from 2002 to 2003?**

A. 163%

**Q. By what percent did the number of West Nile cases decrease from 2003 to 2004?**

A. 198%

**Q. In 2002, what percentage of infections resulted in the death of the victim?**

A. 4.9%

**Q. In 2003, what percentage of infections resulted in the death of the victim?**

A. 2.1%

**Q. In 2004, what percentage of infections resulted in the death of the victim?**

A. 3.3%

**Q. Pennsylvania reported 237 cases of West Nile in 2003, and only 11 cases in 2004. Explain why you think the number of cases of infection dropped so significantly.**

A. Action was taken to prevent the disease. Answers may include using an aggressive mosquito control program, and educating people on prevention.

**Q. On the other coast of the United States, California reported only 3 cases of West Nile in 2003 and 710 cases in 2004! Why do you think there was a tremendous increase?**

A. The disease seems to have spread across the United States from east to west.

**Q. Nebraska reported 1942 cases of West Nile in 2003 and only 30 in 2004. Explain.**

A. Similar to Pennsylvania, Nebraska adopted a very aggressive mosquito control program. Considerable money was spent and continues to be spent on prevention.

**Q. Based on historical data from other states over the past two to three years, predict the number of West Nile infections that will be reported in California in 2005. Explain your response.**

A. Assuming that California will follow the lead of other states, we can expect the number of infections to decrease. However, because California is so highly populated, the incidence of West Nile infection may not decrease as dramatically as it did in a state such as Nebraska. This is an opportunity to discuss disease transmission in large populations.



If you are using the TI-Navigator Classroom Learning System, send the provided LearningCheck assessment to your class to gauge student understanding of the concepts presented in the activity. See the TI-Navigator Basic Skills Guide for additional information on how this classroom learning system may be integrated into the activity.