

INTRODUCTION TO VIROLOGY

OBJECTIVE/RATIONALE

The presence of a virus has a tremendous effect on global economics. The study is important because of the impact on individual and community health. The student will identify characteristics of viruses and the diseases they cause.

TEKS 121.14 5C

TAKS ELA 1, 4, 6
Social Studies 1, 4, 5
Science 1

National Science Education Standards A9-12; C9-12; F9-12; G9-12

National Health Care Skills Standards .01 .07,.09

National Curriculum Standards for School Mathematics S1; S3

KEY POINTS

- I. A virus is a submicroscopic acellular particle containing genetic material surrounded by protein. Virus particles can only be observed by an electron microscope.
- II. The classification of viruses is based on the type of nucleic acid contained within.
 - a. RNA viruses
 - b. DNA viruses
- III. Recognizing the shape, size and structure of different viruses is critical to the study of disease.
 - a. Viruses have an inner core of nucleic acid surrounded by a protein coat.
 - b. Most viruses demonstrate a helical or polyhedral symmetry and some are brick-shaped.
 - c. Most viruses range in size from 20 to 300 nm.
- IV. Viruses replicate within a host cell while utilizing the host cell's DNA. The viral life cycle consists of six stages:
 - a. Attachment
 - b. Penetration
 - c. Uncoating
 - d. Multiplication
 - e. Assembly
 - f. Release
- V. The cultivation of viruses is complex and includes three common methods.
 - a. Chicken egg culture
 - b. Cell culture
 - c. Animal inoculation
- VI. Viral Diseases
 - a. Influenza
 - b. Rabies
 - c. Equine Encephalitis

ACTIVITIES

I. Research and design a multimedia presentation on one of the following viruses:

(Include the prevalence of the virus, the mode of transmission, signs and symptoms, disease, course of the disease, treatments vaccinations available, and the morbidity and mortality rates for each.)

- a. Ebola
- b. Marburg
- c. Influenza
- d. Varicella
- e. Smallpox virus
- f. Rhinovirus
- g. Yellow fever virus
- h. Poliovirus
- i. Cytomegalovirus
- j. Herpes virus
- k. Parainfluenza
- l. HIV
- m. Epstein-barr virus

II. Watch an excerpt from the video, “And the Band Plays On” and debate the impact of the discovery of the aids virus on world politics and ethics.

MATERIALS/RESOURCES

<http://www.virology.net/big-virology/bvhomepage.html>

<http://www.geocities.com/capecanaveral/3504/>

“Brock Biology of Microorganisms; Madigan, et al.; Prentice Hall, 2000; chapter 8

HOSA Biomedical Debate Event Guidelines

ASSESSMENT

Multimedia Rubric

HOSA Biomedical Debate Event Rubric

ACCOMMODATIONS

For reinforcement, the student will diagram stages of viral replication.

For enrichment, the student will research professional journals to identify possible links of viruses to cancers.

REFLECTIONS
