

VIRAL VS. BACTERIA MODES OF INFECTION

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1. Title

Viral vs. Bacterial Modes of Infection

2. Overview and Rationale

This lesson is important for students in understanding patterns of infection and how viral and bacterial agents enter a cell by different mechanisms.

3. Objective/Outcome

Students will compare viral infection and bacterial infection of a mammalian cell.


4. Timeframe –

Block schedule – one 80-minute period.

5. Content Area

Biology, microbiology, virology, and cytology.

6. Content of DVD used

Section on DVD titled “DVD extras” sub-heading  Animations

- 1) Viral infection
- 2) E. Coli Infection.

7. Correlation with Standards – Massachusetts - State Biology standards

Biology Learning Standards for a Full First-Year Course in Grade 9 or 10

2. Structure and Function of Cells

Broad Concept: All living things are composed of cells. Life processes in a cell are based on molecular interactions.

2.1 Relate cell parts/organelles to their functions. *

2.2 Differentiate between prokaryotic cells and eukaryotic cells, in terms of their general structures and degrees of complexity. *

2.5 Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, and active transport). *

3. Genetics

Broad Concept: Genes are a set of instructions encoded in the DNA sequence of each organism that specify the sequence of amino acids in proteins characteristic of that organism.

3.2 Describe the processes of replication, transcription, and translation and how they relate to each other in molecular biology.

3.3 Describe the general pathway by which ribosomes synthesize proteins by using tRNAs to translate genetic information encoded in mRNAs.

Boldface type indicates core standards for full-year courses. An asterisk (*) indicates core standards for integrated courses.

8. Materials

- 1) Two televisions equipped with DVD players running a copy of the DVD **2000 and Beyond – Confronting the microbe menace**.
- 2) Art materials – papers, pencils, crayons, markers etc.
- 3) Coloring pages and readings on infection.

9. Procedure

- 1) Find what students already know about the mode of infection for a virus vs. a bacterium. On the board write, “what we know”, “what we think we know”, “what I would like to know more about”. Ask the students to contribute to the list, which will remain visible throughout the period, about how a virus invades a cell vs. a bacterium.

(10 minutes)

- 2) Divide the class in half “the virus people” and the “bacterium people”. Have the DVD’s playing in loop mode either the viral or bacterial infection clip. Have students observe and take notes on the loops.

(10 minutes)

- 3) Groups of 3 then discuss what they saw and how it compares to what they already knew. The groups are then to come up with their own interpretation of how a virus invades a cell (or bacterium). Students can either draw or act-out the sequence.

(30 minutes)

- 4) Each group will then pair off with a viral group if they were bacterial and visa-versa. If time permits they may then share with another group.

(20 minutes)

- 5) Bring large group back together and look at the list created at the beginning of the class and eliminate incorrect information and additional data that was gathered during activity.

(10 minutes)

10. Homework

Complete reading, highlighting and coloring of microbiology coloring book (handout).

11. Extension

Analyze the clip that includes the type-3 delivery system and compare and contrast to the type-1 delivery system (*E. Coli* vs. *Salmonella*)