High School Science Virtual Learning

Applied Biological Science
Viral Reproduction

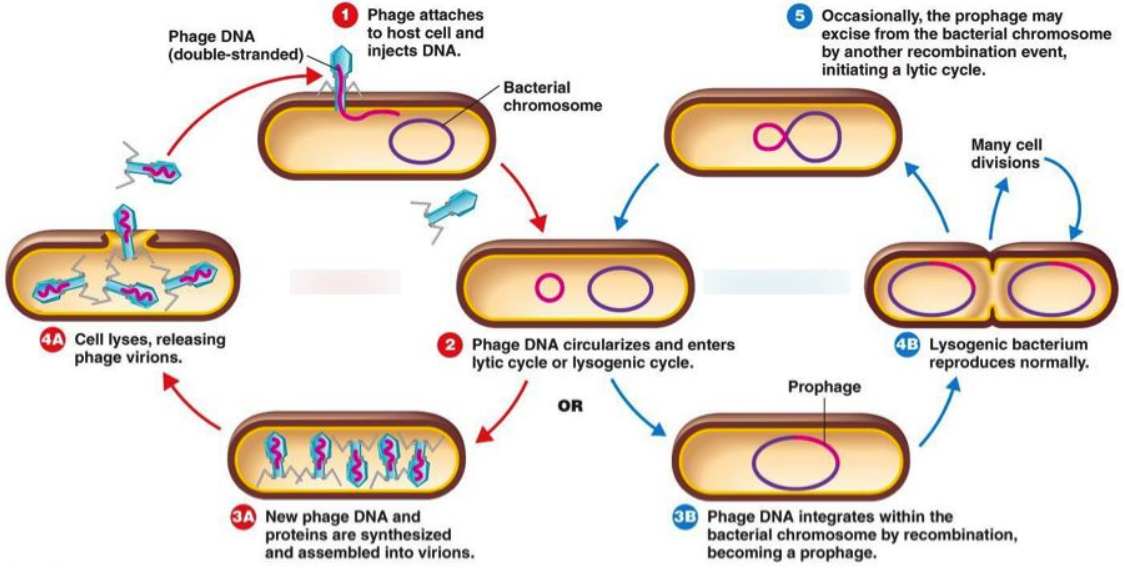
April 22, 2020

High School Applied Biological Science
Lesson: April 22, 2020

Objective/Learning Target:
Describe how a virus reproduces including the difference between the lytic and lysogenic cycles.

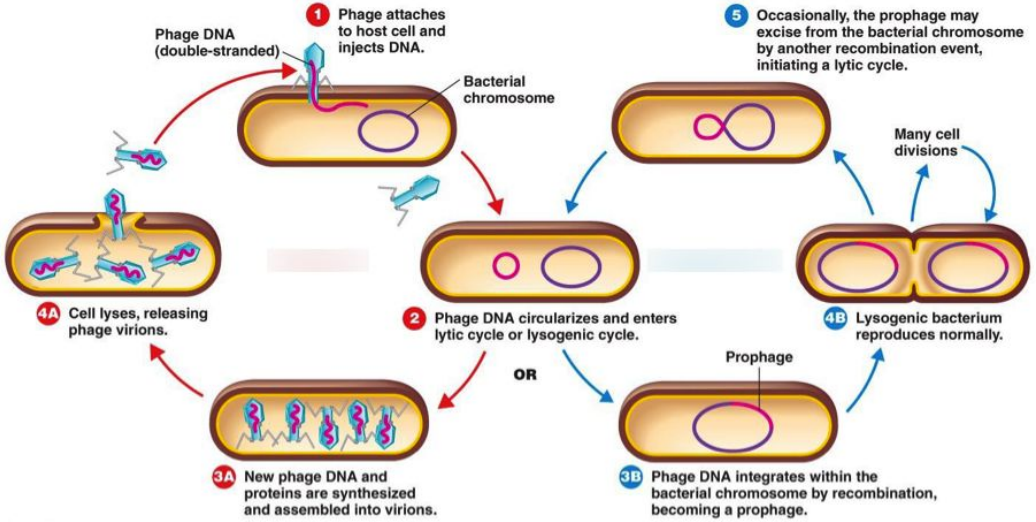
Let's Get Started:

1. Watch this video on viral replication from Khan Academy.
2. What are the two ways in which viruses can replicate?



Let's Get Started: Answer

1. Watch this video on viral replication from Khan Academy.
2. What are the two ways in which viruses can replicate?
   a. The active lytic phase and the inactive lysogenic phase



Lesson Activity:

Click on and read this background information on viral reproduction and answer the following questions:

1. What are the 5 steps in the lytic cycle of virus reproduction?
    a.
    b.
    c.
    d.
    e.
2. What is one disease that follows the lytic cycle?
3. What is a provirus?

Lesson Activity Continued:

4. What are the steps of the lysogenic cycle?
    a.
    b.
    c.
    d.
    e.
    f.
    g.
5. Name one disease that is caused by a lysogenic virus.
6. Why are lysogenic viruses more dangerous than lytic viruses?

Lesson Activity: Answers

Click on and read this background information on viral reproduction and answer the following questions:

1. What are the 5 steps in the lytic cycle of virus reproduction?
    a. Attachment
    b. Entry
    c. Replication
    d. Assembly
    e. Lysis & Release
2. What is one disease that follows the lytic cycle? Common cold
3. What is a provirus? Viral DNA inserted into host cell genome

Lesson Activity Continued: Answers

4. What are the steps of the lysogenic cycle?
    a. Attachment
    b. Entry
    c. Integration of DNA/provirus formation
    d. Spontaneous provirus activation
    e. Replication
    f. Assembly
    g. Lysis & Release
5. Name one disease that is caused by a lysogenic virus. HIV
6. Why are lysogenic viruses more dangerous than lytic viruses?
    Can lay “dormant” for years with no signs/symptoms until activated, increasing transmission

Practice Questions

Practice identifying each stage of the viral replication cycle on the diagram on this worksheet:

1. Attachment/Absorption
2. Entry
3. Uncoating
4. Replication
5. Assembly
6. Release

a) The pieces of the virus are assembled
b) New pieces of viral proteins and genetic material such as DNA or RNA are produced.
c) The virus attaches to the cell membrane of the host cell.
d) The virus is released from the cell due to cell lysis or budding.
e) The virus then unpacks its contents and loses the outer layer shell known as a capsid.
f) The virus enters the cell.

Practice Questions - Answers

Practice identifying each stage of the viral replication cycle on the diagram on this worksheet:

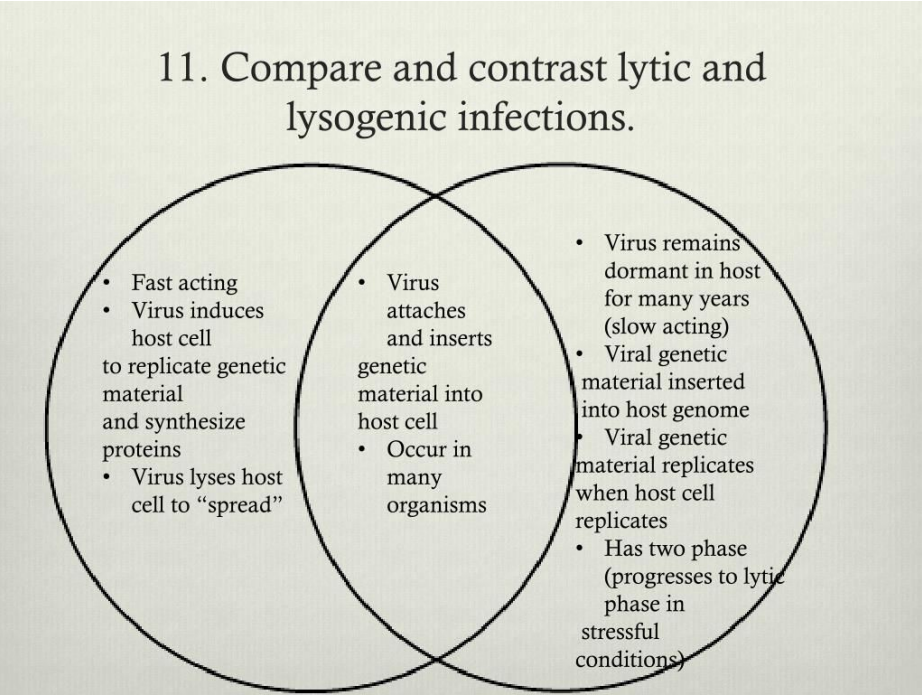
1. C
2. F
3. E
4. B
5. A
6. D

Additional Practice Questions

- Complete a venn diagram comparing and contrasting the lytic and lysogenic cycles.
- What are some possible reasons that a virus would prefer one cycle over the other?

Additional Practice Questions - Answers

- Complete a venn diagram comparing and contrasting the lytic and lysogenic cycles.
- What are some possible reasons that a virus would prefer one cycle over the other?
    - It may be more advantageous to lay dormant for a while (conserve energy) or produce many virus particles to infect many more cell, etc



Additional Practice

- View this worksheet for additional practice.
- Check your understanding by writing a fictional story that explains how viruses replicate. Make sure to include all of the steps and both cycles.