

**AP Biology**  
**Chapter 19.1 - 19.2 Guided Reading: Viruses**  
**10ed.**

Name \_\_\_\_\_

1. What was some early evidence of the existence of viruses? Why were they difficult to study?
  
2. What are the four forms of viral genomes?
  
3. What is a *capsid*? What different shapes may capsids have?
  
4. As you can see. All viruses consist of nucleic acid enclosed in a protein coat. Some viruses also have a membranous envelope. What are the components of *viral envelope*? Which component is derived from the host cell, and which is of viral origin?

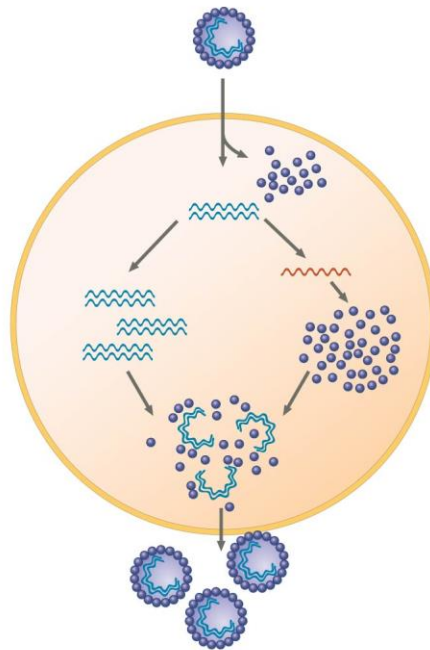
Viral Envelope Component	Derived from Host or Virus?

5. What is the role of an *envelope* in animal viruses?
  
6. For the virus showed in the following figure, label the *protein capsid*, *tail fibers*, *head*, *tail sheath*, and *genome*.
  - a. What type of virus is this? \_\_\_\_\_
  
  - b. What does its name mean? \_\_\_\_\_
  
  - c. What is its host? \_\_\_\_\_
  
  - d. Is the genome of this virus DNA and RNA? \_\_\_\_\_



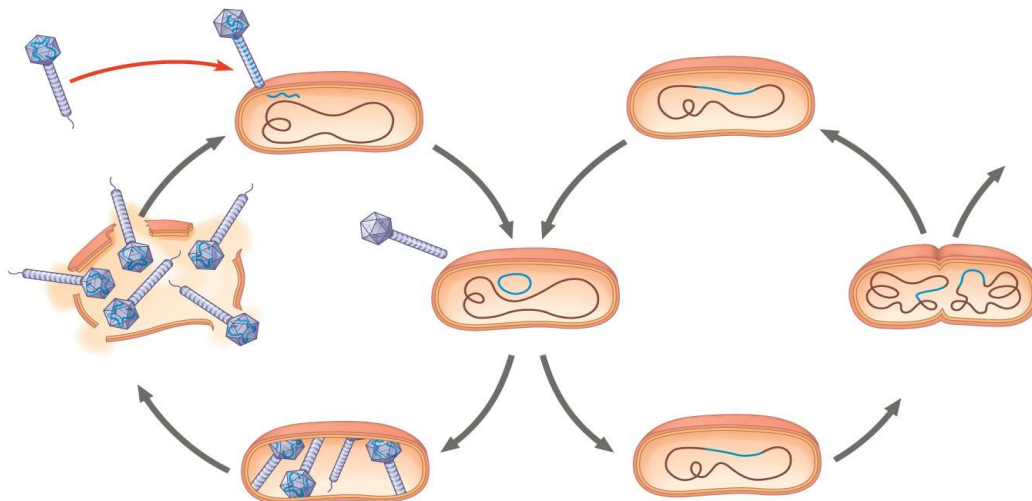
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7. What property of a virus determines its attachment to a host cell membrane?
8. Viruses are *obligate intracellular parasites*. What does this mean?
9. What is meant by *host range*? Distinguish between a virus with a broad host range and one with an extremely limited host range, and give an example of each.
10. Compare the *host range* for the rabies virus to that of a human cold virus.
11. What components of the host cell does a virus use to reproduce itself?
12. How does a DNA virus reproduce its genome?
13. How do most RNA viruses replicate their genome?
14. On the figure of a simplified viral reproductive cycle, label the arrows to show these processes: *transcription*, *translation*, *infection*, *replication*, and *self-assembly*. Annotate your labels to explain the process of viral reproduction.



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15. What are *bacteriophages*? Distinguish between *virulent* and *temperate* phages.
16. What portion of a phage enters the host cell? How does it do this?
17. What are *restriction enzymes*? How do they prevent viral infections of bacteria?
18. Why don't restriction enzymes destroy the DNA of the bacterial cells that produce them?
19. What are three ways bacteria may win the battle against the phages?
20. What is a *prophage*?
21. Because cells that have incorporated phage DNA into their genome may continue to divide and propagate the viral genome, this might be considered somewhat like the Trojan horse. What might trigger the switchover from *lysogenic* to *lytic* mode?
22. Label these elements on the following figure: *lysogenic phage*, *lysogenic cycle*, *lytic cycle*, *prophage*, *phage DNA*, *bacterial chromosome*, and *self-assembly*.

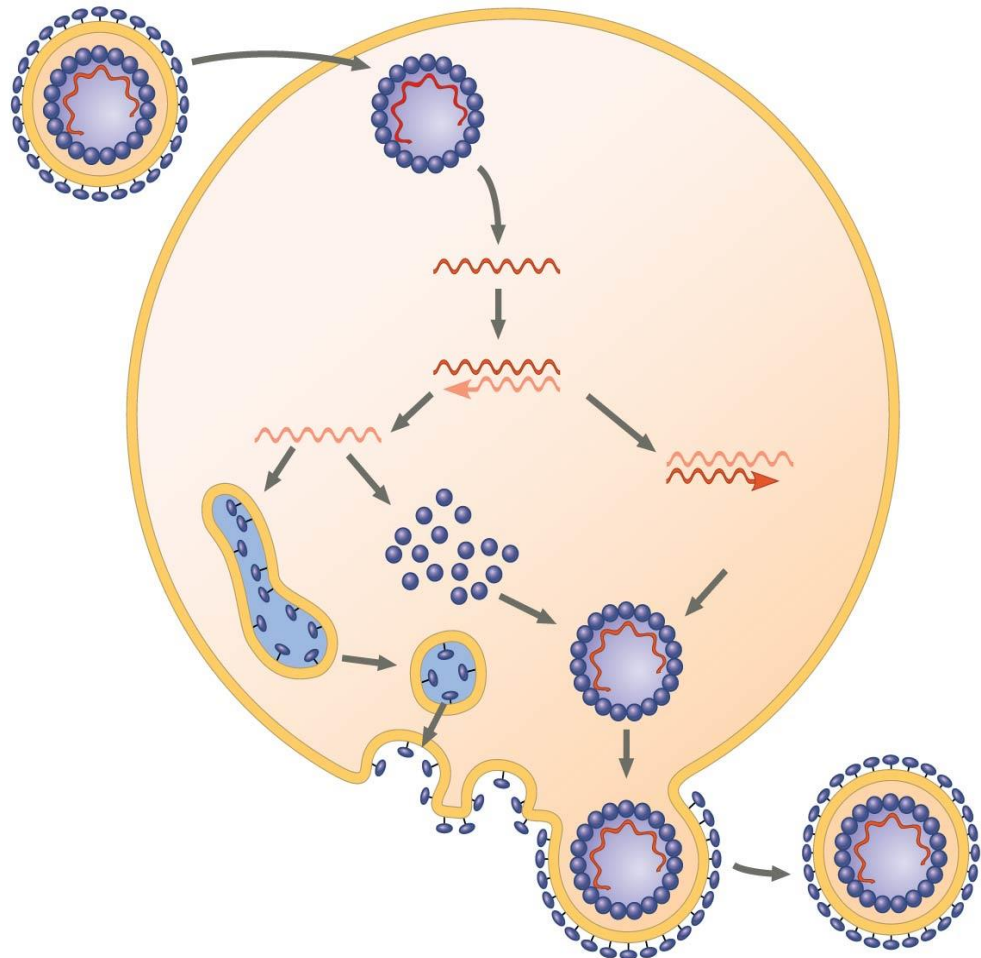


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23. Describe the *lytic* and *lysogenic* modes of bacteriophage reproduction.

24. What are two elements that nearly all animal viruses have?

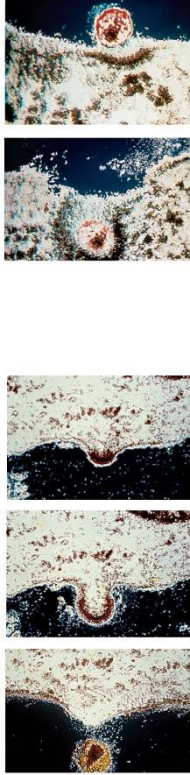
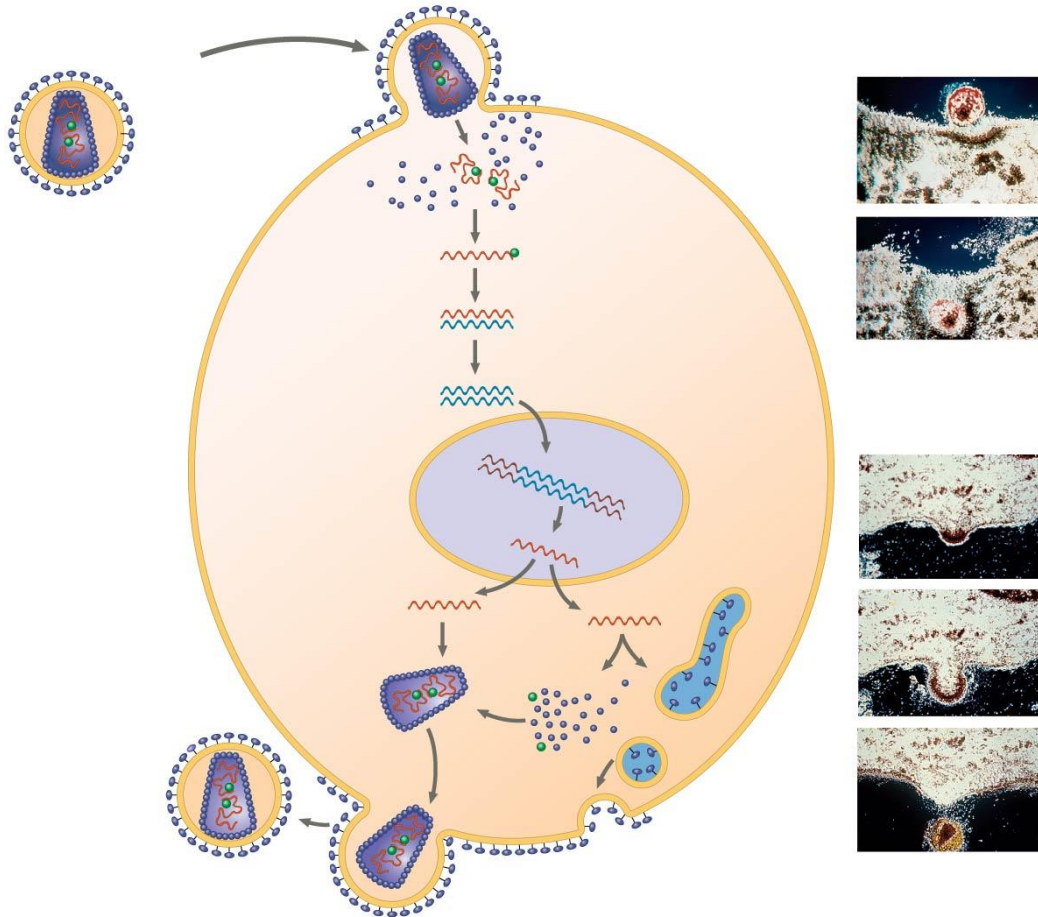
25. The infection of an animal cell by an RNA virus with an envelope is shown in the figure. In this viral infection the RNA genome serves as a template for mRNA synthesis. This is the pattern of infection for hepatitis C, SARS, rubella, and many others. On the figure, place the label lines and summarize the eight steps of infection.



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26. What is a *retrovirus*? How do retroviruses, such as HIV, replicate their genome?

27. Here is a sketch of HIV. Label these parts: *envelope*, *reverse transcriptase*, *RNA*, and *capsid*.



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28. The sketch in the previous question shows the infection of a cell by HIV. Extend the label lines to give a complete explanation of the 10 steps to the infectious process.

29. Compare and contrast the *prophage* and a *provirus*. Which are you likely to carry?

30. The final section in Concept 19.2 is titled “Evolution of Viruses.” From this part, describe the two possible sources of viral genomes.

	Description of the Mobile Genetic Element
Plasmids	
Transposons	

