

Lesson 13.2: Critical Reading

Name _____ Class _____ Date _____

Read these passages from the text and answer the questions that follow.

Characteristics of Viruses

An individual virus is called a **virion**. It is a tiny particle much smaller than a prokaryotic cell. Because viruses do not consist of cells, they also lack cell membranes, cytoplasm, ribosomes, and other cell organelles. Without these structures, they are unable to make proteins or even reproduce on their own. Instead, they must depend on a host cell to synthesize their proteins and to make copies of themselves. Viruses infect and live inside the cells of living organisms. When viruses infect the cells of their host, they may cause disease. For example, viruses cause AIDS, influenza (flu), chicken pox, and the common cold.

Although viruses are not classified as living things, they share two important traits with living things. They have genetic material, and they can evolve. This is why the classification of viruses has been controversial. It calls into question just what it means to be alive. What do you think? How would you classify viruses?

Structure and Classification of Viruses

Viruses vary in their structure. The structure of a virus determines how it is classified.

Structure of Viruses

A virus particle consists of DNA or RNA within a protective protein coat called a **capsid**. The shape of the capsid may vary from one type of virus to another.

Some viruses have an envelope of phospholipids and proteins. The envelope is made from portions of the host's cell membrane. It surrounds the capsid and helps protect the virus from the host's immune system. The envelope may also have receptor molecules that can bind with host cells. They make it easier for the virus to infect the cells.

Classification of Viruses

Viruses are classified on the basis of several traits. For example, they may be classified by capsid shape, presence or absence of an envelope, and type of nucleic acid. **Table 13.2** gives examples of virus families and their traits. Most systems of classifying viruses identify at least 20 virus families, but only 4 are shown in the table. Have any of these viruses made you sick?

Table 13.2: **Virus Classification: Four Examples**

| Virus Family | Capsid Shape | Envelope Present? | Type of Nucleic Acid | Disease Caused by a Virus in this Family |
|------------------|--------------|-------------------|----------------------|--|
| Adenovirus | icosahedral | no | DNA | acute respiratory disease |
| Herpesviruses | icosahedral | yes | DNA | chicken pox |
| Orthomyxoviruses | helical | yes | RNA | influenza |
| Coronaviruses | complex | yes | RNA | common cold |

Questions

1. Describe a virion.

2. Why are viruses not able to make their own proteins?

3. Describe the structure of a virus.

4. What are the traits used to classify a virus?

5. Do you think viruses should be classified as “living organisms”? Why or why not?