

Viruses

1. a. What does the word virus mean? Explain the controversy regarding whether it is alive or not.

A virus is a small infectious agent that replicates only inside the living cells of other organisms.

b. Name the distinctive characteristics of viruses and why they're not included in any kingdom.

(i) the genetic material made from either **DNA or RNA**, long molecules that carry genetic information;

(ii) a **protein coat**, called the **capsid**, which surrounds and protects the genetic material; and

(iii) in some cases an **envelope of lipids** that surrounds the protein coat when they are outside a cell.

c. Name some morphological shapes of viruses and give an example of each.

Filamentous viruses are long and cylindrical. Many plant viruses are filamentous, including the *TMV (tobacco mosaic virus)* which was the first virus identified.

Isometric viruses have shapes that are roughly spherical. Examples include poliovirus (shown) and herpesviruses.

Enveloped a virus that has an outer wrapping or envelope.

Head and tail viruses infect bacteria. They have a head that is similar to icosahedral viruses and a tail shape like filamentous viruses. Here are the three families based on like shape and other characteristics:

d. Explain the importance of vaccines to combat viruses. How do they work?

A vaccine works by training the immune system to recognize and combat pathogens

- Live, attenuated vaccines fight viruses. These vaccines contain a version of the living virus that has been weakened so that it does not cause serious disease in people with healthy immune systems.
- Inactivated vaccines also fight viruses. These vaccines are made by inactivating, or killing, the virus during the process of making the vaccine. The inactivated polio vaccine is an example of this type of vaccine. Inactivated vaccines produce immune responses in different ways than live, attenuated vaccines. Often, multiple doses are necessary to build up and/or maintain immunity.

e. Describe how viruses multiply – watch video

f. Have viral diseases ever been eradicated? Why is it difficult to treat patients with viral diseases?

Yes

Smallpox was caused by infection with variola virus. The English physician Edward Jenner discovered the first vaccine - cowpox to protect humans from smallpox in 1796, making it the first vaccine

Rinderpest, was a viral disease which infected cattle, domestic buffalo, and some other species of even-toed ungulates, including buffaloes, large antelope and deer, giraffes, wildebeests, and warthogs. Rinderpest belonged to the same family as measles

2. Through pictures, video, or detailed descriptions, explain the difference in the following exanthematous or rash diseases:

Identify pictures

3. Choose two of the following viral diseases and describe their form of infection, symptoms and prevention. Demonstrate your learning creatively through a display, presentation, or prepared speech:

It is impractical to fully cover each disease in depth enough for a presentation within the wiki. A good place to get an overview of each viral disease is Wikipedia and the CDC website.

Herpes

Dengue

With more than one-third of the world's population living in areas at risk for infection, dengue virus is a leading cause of illness and death in the tropics and subtropics. As many as 400 million people are infected yearly.

4. Explain the difference between a cold and the flu

Fever, Onset, Symptoms

5. What is the difference between a virus and a prion? Name a disease caused by a prion.

Mad Cow disease

6. Learn about a Pandemic: Covid

7. Name two types of disinfectant you can make at home?

8. Name three different types of mask that do not need to be sewn. Take a picture of yourself in a mask that you have made and send it to Pathfinder University

9. Take part in online discussion or discuss what you learned with your family.
