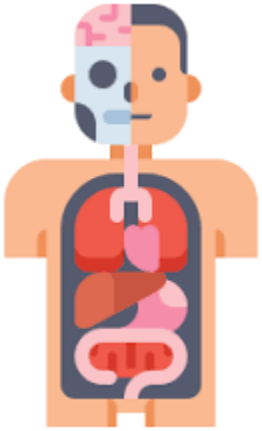
Name: _____ Hour: _____ Teacher: Ms. Rozema

Biology

Unit 1:

Living Characteristics Packet



Learning Objectives:

- ☐ Explain and apply concepts of Living Characteristics.

Relevant Vocabulary Terms:

Living Characteristics

- ☐ Cell
- ☐ Cell Theory
- ☐ Reproduce
- ☐ Take In and Use Energy and Matter (Eat)
- ☐ Move
- ☐ Respond and Adapt
- ☐ Grow and Develop
- ☐ Excrete Waste
- ☐ Virus
- ☐ Abiotic
- ☐ Biotic

.

What does it mean to be LIVING?

Use the space below to brainstorm / list out what you think makes something "LIVING".

Sort the Following Words into Living–Nonliving–Unsure categories below:

Tree Grass Rock Dirt Car Bacteria Virus Computer Dog

Worm Water Air Sunlight Ant Electricity Pencil Wood Phone

Living Things *(Things that are currently living and were once living.)*	**Nonliving Things** *(Things that were never living and are not living.)*	**Unsure** *(I'm not really sure what it is…)*

NOTES: Living Characteristics

(1) To be considered living, something must be able to complete all of the following on its own OR with another of the same kind / species:

_____

_____

_____

_____

_____

_____

(2) All living things are also made of at least 1 _____.

The Cell Theory connects to these living characteristics by stating that:

_____

_____

_____

(3) We can use terms like BIOTIC and ABIOTIC when we talk about LIVING and NONLIVING things:

Biotic Things: _____

_____

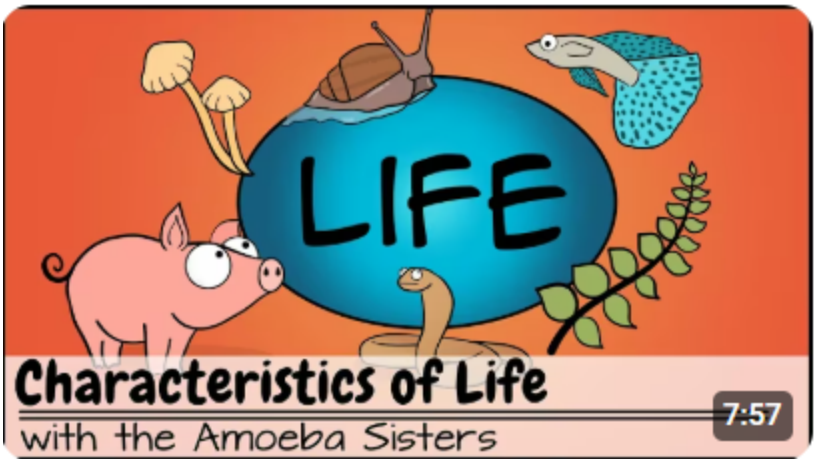
(Examples of Biotic Things:) _____

Abiotic Things: _____

_____

(Examples of Abiotic Things:) _____

Amoeba Sisters Video Recap "Characteristics of Life"



Video Big Ideas:

- **What are all living things made of? _____**
- **What is Homeostasis? _____**

  _____

- **What does "Metabolism" mean? _____**

  _____

- **What else do living things need to be able to do? _____**

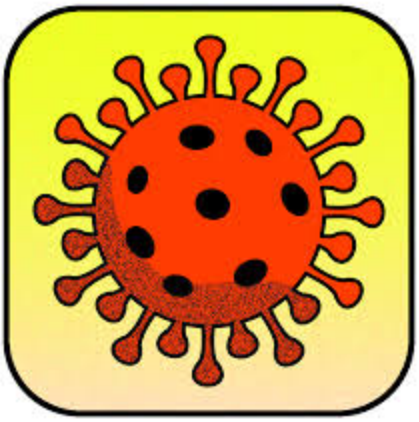
  _____

  _____

  _____

  _____

  _____



READING & COMPREHENSION QUESTIONS

–VIRUSES–

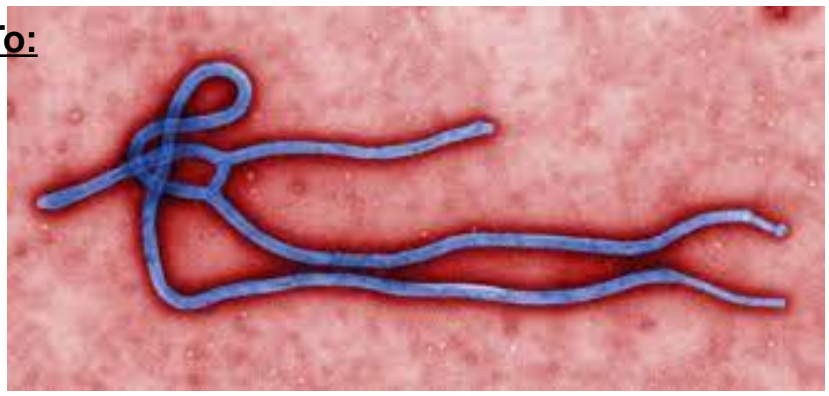
PART 1: Ebola & Virus Reading

[Taken from the CDC and Medical News Today.]

You Need To:

(1) Read the text about Ebola and Viruses.

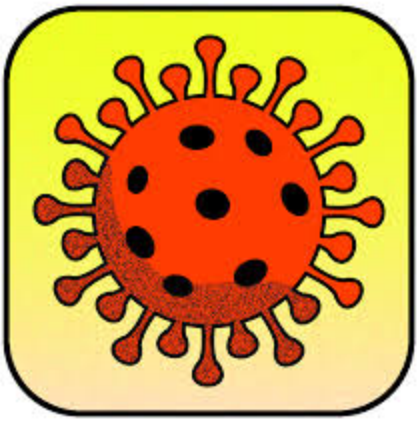
(2) When you read information that relates to the Living Characteristics we learned about, HIGHLIGHT or UNDERLINE!



The ebola virus disease (EVD) is a deadly disease with occasional outbreaks that occur mostly on the African continent. EVD most commonly affects people and nonhuman primates (such as monkeys, gorillas, and chimpanzees). It is caused by an infection with a group of viruses within the genus *Ebolavirus*:

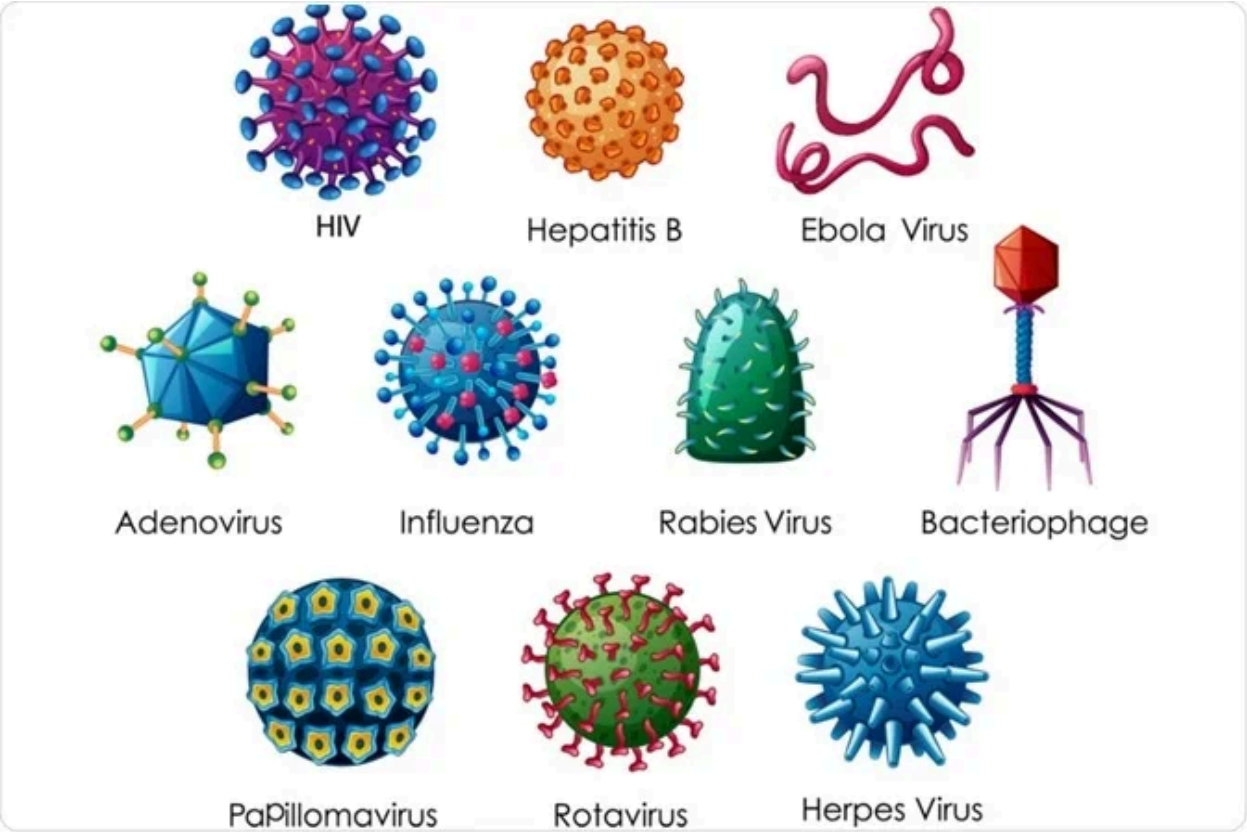
- Ebola virus (species *Zaire ebolavirus*)
- Sudan virus (species *Sudan ebolavirus*)
- Taï Forest virus (species *Taï Forest ebolavirus*, formerly *Côte d'Ivoire ebolavirus*)
- Bundibugyo virus (species *Bundibugyo ebolavirus*)
- Reston virus (species *Reston ebolavirus*)
- Bombali virus (species *Bombali ebolavirus)*

Viruses are biological entities that can only thrive (use matter and energy, respond, grow, produce waste) and multiply in a host, which is a living organism such as a human, an animal, or a plant. Some viruses cause disease. A virus may also affect one organism in one way but a different one in another. This explains why a virus that causes illness in a cat may not affect a human.

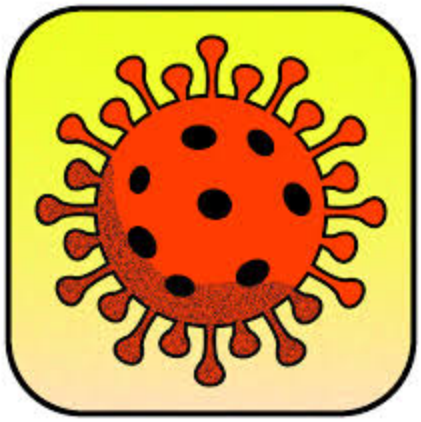


Viruses vary in form and complexity. Viruses have different shapes and sizes. Scientists categorize viruses according to various factors, including:

- *their shape and size, which may be rod-shaped, almost spherical, or other shapes*
- *the type of their nucleic acid, which contains their genetic information*
- *whether or not they have a protective lipid envelope derived from the host cell*

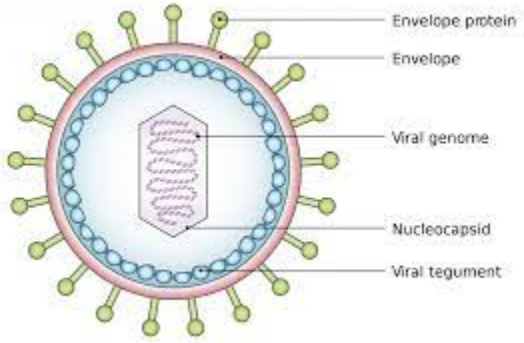


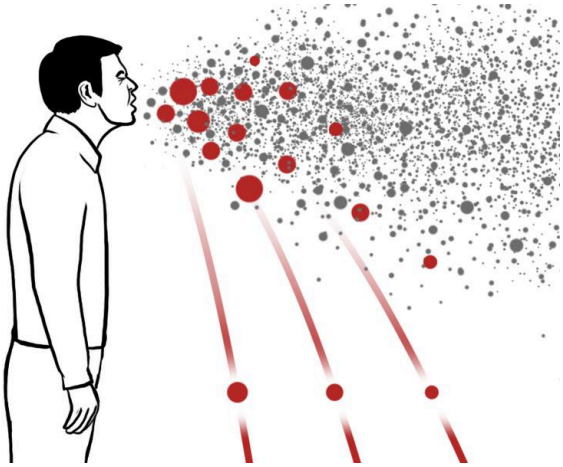
The outside of viruses are made mostly of a protein-based coat. Some viruses have an additional covering called the “envelope”. The outside of viruses may be spiky, helping them to latch onto and enter host cells. On the inside, viruses have genetic material, DNA or RNA, just like our cells. Once viruses get inside of a host, they land on a host cell and inject their genetic material. The host cell then replicates the viruses by using the viral DNA/RNA to make more virus parts and viruses. They can only replicate with the use of a host cell. Once the cell is full of newly made viruses, it explodes, and the new viruses are released. Hosts make more viruses.



Viruses do not need to take in any nutrients, foods or gasses, as they rely on the mechanisms of the host cell. As long as the host cell is healthy and capable of carrying the viruses, the viruses will be fine. Viruses also do not excrete any waste products, as they do not have any processes that occur inside of them which produce waste compounds.

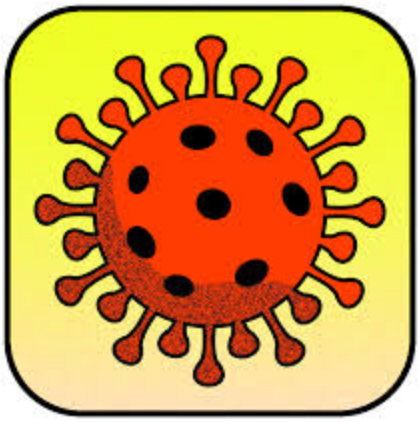
The virus first spreads to people through direct contact with the blood, body fluids and tissues of animals. Ebola virus then spreads to other people through direct contact with body fluids of a person who is sick with or has died from EVD. This can occur when a person touches these infected body fluids or objects that are contaminated with them. The virus then gets into the body through broken skin or mucous membranes in the eyes, nose, or mouth. People can get the virus through sexual contact with someone who is sick with or has recovered from EVD. The virus can persist in certain body fluids, like semen, after recovery from the illness.



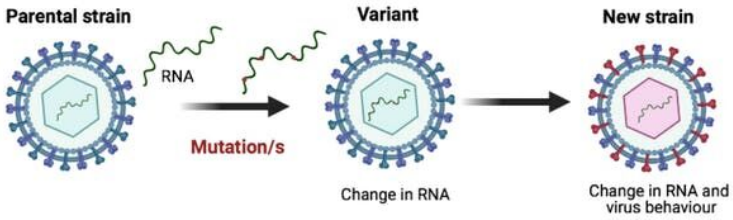


Viruses do not have any mechanism to move on their own. The virus spreads through direct contact (such as through broken skin or mucous membranes in the eyes, nose, or mouth) with:

- *Blood or body fluids (urine, saliva, sweat, feces, vomit, breast milk, amniotic fluid, and semen) of a person who is sick with or has died from Ebola virus disease (EVD).*
- *Objects (such as clothes, bedding, needles, and medical equipment) contaminated with body fluids from a person who is sick with or has died from EVD.*
- *Infected fruit bats or nonhuman primates (such as apes and monkeys).*



Because viruses mutate and form so many new strains, people often think that the viruses are responding and adapting. However, it is actually the hosts and their contact that allows viruses to mutate. As more hosts contract viruses, contract a variety of viruses simultaneously, and manufacture viruses faster and faster, this increases the chances of producing viruses with mutations (or genetic errors).

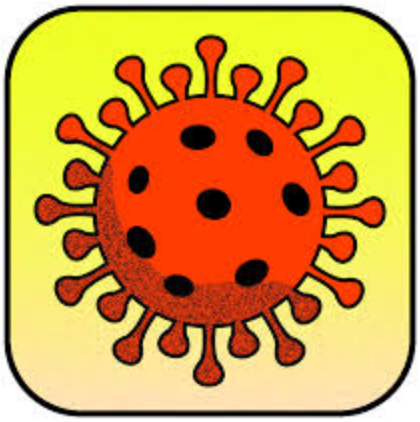


When people become infected with Ebola, they do not start developing signs or symptoms right away. This period between exposure to an illness and having symptoms is known as the incubation period. A person can only spread Ebola to other people after they develop signs and symptoms of Ebola. Symptoms may appear anywhere from 2 to 21 days after contact with the virus, with an average of 8 to 10 days. The course of the illness typically progresses from “dry” symptoms initially (such as fever, aches and pains, and fatigue), and then progresses to “wet” symptoms (such as diarrhea and vomiting) as the person becomes more sick.

Primary signs and symptoms of Ebola often include some or several of the following:

- *Fever*
- *Aches and pains, such as severe headache and muscle and joint pain*
- *Weakness and fatigue*
- *Sore throat*
- *Loss of appetite*
- *Gastrointestinal symptoms including abdominal pain, diarrhea, and vomiting*
- *Unexplained hemorrhaging, bleeding or bruising*

Other symptoms may include red eyes, skin rash, and hiccups (late-stage).



PART 2: Ebola & Virus Reading Questions

You need to:

(1) Answer all of the following questions.
(2) Use the reading in Part 1 to answer the questions.

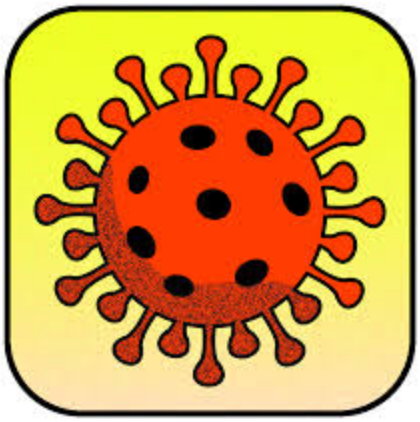
Question #1: What is Ebola?

Question #2: What is a Virus?

Question #3: What is a Host?

Question #4: Are all Viruses shaped / structured the same? Discuss.

Question #5: What are Viruses made of?



Question #6: For each of the following Living Characteristics, identify whether or not Viruses complete each, and what they may do instead.

a) The ability to REPRODUCE:

_____

_____

_____

_____

b) The ability to "EAT" (or take in matter and energy): _____

_____

_____

_____

c) The ability to EXCRETE WASTE: _____

_____

_____

_____

d) The ability to GROW and DEVELOP: _____

_____

_____

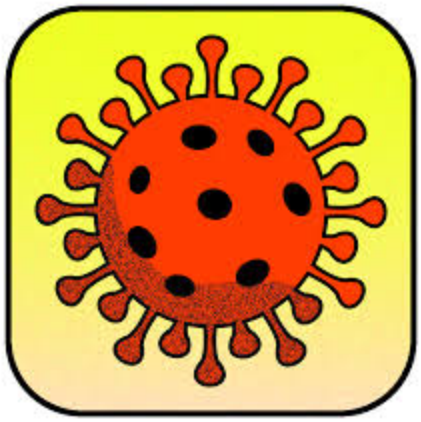
_____

e) The ability to MOVE:

_____

_____

_____



f) The ability to RESPOND and ADAPT:

_____

_____

_____

Question #7: How does Ebola spread (or transmit)?

_____

_____

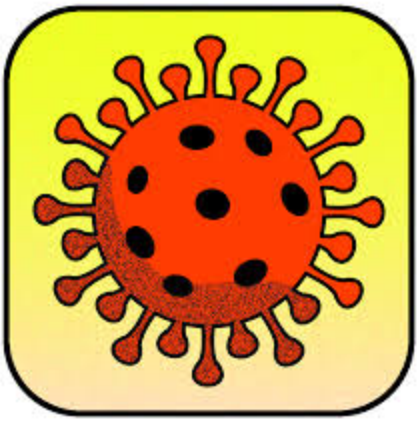
_____

Question #8: What are some of the symptoms of Ebola?

_____

_____

_____



PART 3: Virus CER
(GRADED!!)

Standard: Explain and apply concepts of the Living Characteristics.

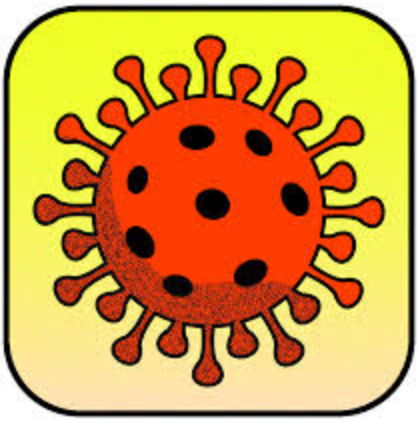
Prompt:
Are Viruses living or nonliving?

Criteria and Scoring Instructions :

- ☐ **(1pt)** Student has a clear claim that identifies EITHER:
  - ☐ Viruses are living.
    Or
    Viruses are not living.
  - ☐ Student's claim, examples and explanation/s are accurate.

- ☐ **(3pts)** Student has between 3-5 relevant examples / pieces of evidence about viruses.
  - ☐ Student's observations / pieces of evidence support the claim.

- ☐ **(6pts)** Student discusses and uses the Living Characteristics *to explain how the examples support the claim*.



Your CER Writing

(1) What is your CLAIM? _____

_____

_____

(2) Reason / Evidence #1 that Supports your Claim: _____

_____

(3) Reason / Evidence #2 that Supports your Claim: _____

_____

(4) Reason / Evidence #3 that Supports your Claim: _____

_____

(5) Explain how and why your 3 Reasons support your claim: _____

_____

_____

_____

_____

_____