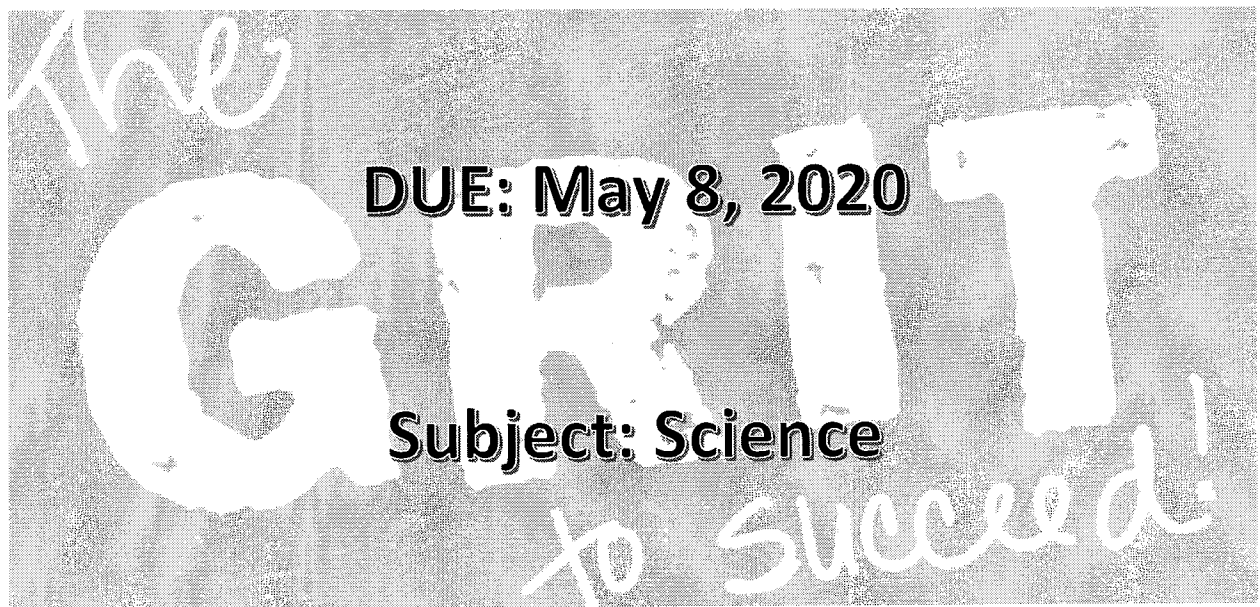


WEEK 1



Teacher: Ruiz

rupruiz@tUSD.net

INSTRUCTIONS FOR WEEK ONE-PACKET SCIENCE

PART 1

- Read the lyrics more than just one time
- If possible, read the lyrics to a family member

PART 2

- Fill in the blanks with the correct word
- Next, using the words from the blanks (correct words) write a short summary that describes the theme or meaning of the song.

PART 3

- Read the word and definition
- Follow the direction to complete this section...we have done this before.
- If possible, create your own images
- Next, create a vocabulary chart...it can be a T-Chart...word then the definition.

PART 4

- READ/RESPONSE
- Only underline or highlight 5-7 words...ONLY WORDS...NO PHRASES...NO SENTENCES
- Usually proper nouns or the name of something are the best
- Answer the question
- Then and only then, write two summary sentences using at least 3-5 key words you underlined or highlighted.

PART 5

- Using the page provided, draw the different types of viruses....do all for bonus points!

PART 6

- With all your newly acquired knowledge and using the template provided, supply the following:
- Pick three facts or historical events
- Use the template provided
- Write a response that displays you proficiency concerning this topic
- BONUS POINTS if you compare today's Coronavirus in your response!

Name _____

Date _____



Viruses

Part I

A virus can have an impact that's mean and mighty,
But viruses are teeny-tiny.
They have no cells and usually aren't considered living
Based on scientists' "life" definition.
They need a host cell to reproduce or replicate.
Look, let me demonstrate.
A host can be any kind of life:
Animal, plant, bacteria — yeah, that's right.
Viruses are genetic information,
That's RNA or DNA,
Inside of a protein shell called a capsid,
Which can come in different shapes, OK?
Antibiotics don't work on a virus,
So for a virus, a doctor won't prescribe this.
They only work on bacteria,
So a virus doesn't meet the criteria.
In humans, viruses cause
Ebola, Zika, the flu, even chicken pox.
Some viruses may be latent;
If so, you'll have no symptoms until their reactivation.
Thanks to antibodies, you and me
Can't get exactly the same cold twice: that's immunity.
For some viruses, there are vaccines, trust.
They give us immunity without infecting us.

Want to go viral like a meme on cells?
Viruses are genomes inside protein shells.

They're tiny, tricky, infectious agents
That need host cells to replicate, yes.

Every type of virus is unique,
But there are general viral life-cycle steps that repeat.

Step 1: they attach to a host cell.

And for the host cell, it doesn't go well.

Some viruses are very specific on how and where
They attach. HIV sees T Cells and goes there.

Step 2: they enter the cell.

Bacteriophages do this very well.

They inject just their genetic material
Into a host that is always bacterial.

Some viruses have different approaches:

Many enter cells through endocytosis.

Step 3: they replicate.

That means, "to make a copy," to set it straight.

In order for new virus to come about,
New genomes and proteins are built like bricks of a house.

The virus takes over the cell's machinery
To build what it needs; now, that's some thievery.

Step 4: they assemble,

Put together from genomes and proteins that were copied like a stencil.

Step 5: release, let me tell.

The new virus will exit and infect another cell.

Influenza leaves by budding, but worse:

Some exit by lysis when the host cell bursts.

Want to go viral like a meme on cells?

Viruses are genomes inside protein shells.

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Although viruses are tricky to combat, doctors and researchers are always hard at work. In fact, thanks to vaccines, smallpox has been eradicated. And medical researchers are currently exploring the use of viruses for gene therapy, which could help lead to future medical breakthroughs. Now, let's see if we can get this song to go viral.

Want to go viral like a meme on cells?

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Date _____



Viruses

Part 2

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Look, let me demonstrate.

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Date _____

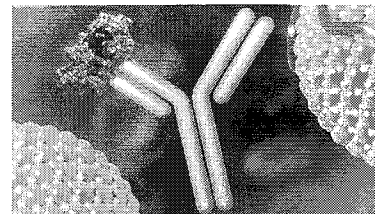
Viruses - Vocab Cards

Part 3

antibody noun

a protein produced by the body to protect against infection.

The flu vaccine stimulates the body to make *antibodies* against the flu.



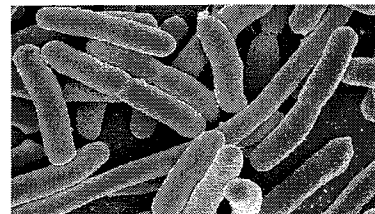
Use this word in a sentence or give an example to show you understand its meaning:

Draw this vocab word or an example of it:

bacteria noun

tiny, one-celled organisms that are neither plants nor animals. They are involved in infectious disease and decay. They live nearly everywhere on planet Earth, including in the human body.

Jesse felt bad for the *bacteria* because they only had one cell and sometimes caused disease.



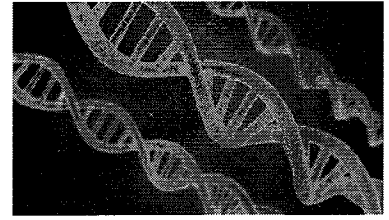
Use this word in a sentence or give an example to show you understand its meaning:

Draw this vocab word or an example of it:

DNA abbreviation

the chemical found in cells that is the main component of chromosomes and carries genetic information.

Identical twins have the same *DNA*, which is why they have the same characteristics.



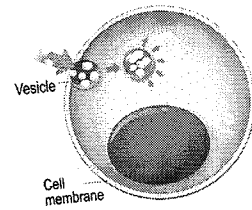
Use this word in a sentence or give an example to show you understand its meaning:

Draw this vocab word or an example of it:

endocytosis noun

a method of cellular transport in which an outside substance is surrounded by part of a cell's membrane and incorporated into the cell.

Endocytosis is one way cells get the nutrients they need to survive.



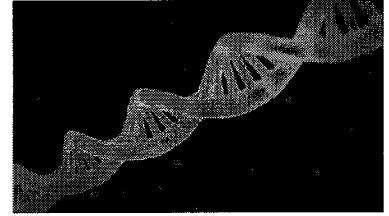
Use this word in a sentence or give an example to show you understand its meaning:

Draw this vocab word or an example of it:

genome noun

the full set of chromosomes that contain the genetic information for an organism.

The human *genome* may contain up to 10 million individual genes.



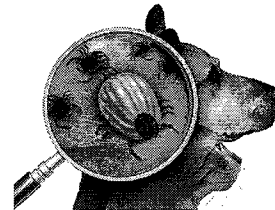
Use this word in a sentence or give an example to show you understand its meaning:

Draw this vocab word or an example of it:

host noun

the living animal or plant on which a parasite lives and feeds.

Ticks and other parasites must get nutrition and physical protection from a human or animal *host*.



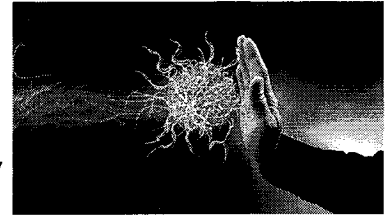
Use this word in a sentence or give an example to show you understand its meaning:

Draw this vocab word or an example of it:

immunity noun

the body's ability to resist infection from a particular disease.

When you get the measles vaccine, you develop an *immunity* and likely won't become infected with measles in your lifetime.



Use this word in a sentence or give an example to show you understand its meaning:

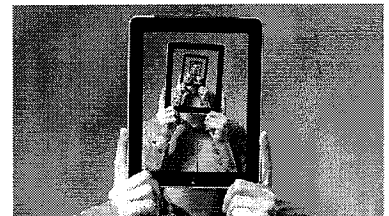
Draw this vocab word or an example of it:

replicate verb

to copy or repeat.

I couldn't *replicate* the photograph he took. I tried, but it did not look exactly the same.

Synonyms: copy, duplicate, reproduce



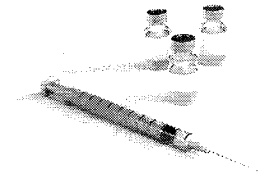
Use this word in a sentence or give an example to show you understand its meaning:

Draw this vocab word or an example of it:

vaccine noun

a prepared substance used to help the immune system protect against a disease. They are usually made from germs of the disease that are dead or not active.

The flu *vaccine* is effective at preventing the flu.



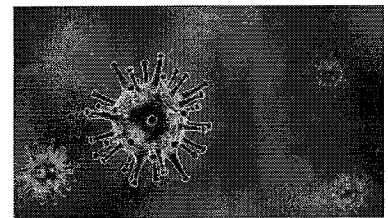
Use this word in a sentence or give an example to show you understand its meaning:

Draw this vocab word or an example of it:

virus noun

a microscopic, often infectious agent composed of DNA or RNA inside a protein capsule.

The flu and the common cold are caused by a *virus*, but strep throat is caused by bacteria.



Use this word in a sentence or give an example to show you understand its meaning:

Draw this vocab word or an example of it:

Name _____

Date _____

Viruses

Part 4

Use the text to answer each question below.

1. A virus is a genome, or set of chromosomes, contained inside a protein capsule called a capsid. A virus can be either a single or double strand of RNA or DNA. Although viruses are made of genetic information, they do not have cells. They also need to attach to a host cell in order to live and reproduce. Host cells can be from animals, plants and even bacteria and fungi. Scientists debate whether or not viruses are considered living organisms. Most agree that viruses are not living.

Which of these statements is true based on the information in the passage?

- | | |
|--|--|
| A. Viruses can survive independently for many years. | B. Viruses need to have a capsid in order to reproduce. |
| C. Viruses blur the boundary between what is and is not considered "life." | D. Viruses and bacteria work in exactly the same way to infect humans. |
2. Viruses come in several different shapes. They can be helical, or rod-shaped. They can be many-sided or sphere-like—polyhedral or icosahedral. Some viruses are complex, combining different aspects of helical, polyhedral and icosahedral shapes. Others, like influenza, have an outer envelope of fatty membrane outside the capsid. No matter their shape, viruses are all extremely small—thousands of times smaller than human body cells. The largest virus is smaller than the smallest bacteria.

Tobacco mosaic virus (TMV) is a rod-shaped virus that affects many types of plants. Which of the following categories best describes TMV?

- | | |
|----------------|---------------|
| A. helical | B. polyhedral |
| C. icosahedral | D. complex |

3. Every kind of virus is unique, but they generally go through the same life cycle. First, a virus attaches to a host cell. Then, it enters the cell. Plant and animal viruses enter through endocytosis, a process in which the cell membrane forms a pocket around the virus. Bacterial viruses, or bacteriophages, simply inject their genetic material into the cell. Next, the virus replicates, or reproduces, by hijacking the host cell's machinery. New viruses are built from the copies of the original virus's genome and protein capsid. Finally, the completed viral particles are released from their cells and try to infect other cells. Sometimes viruses damage their host cells while exiting, which can make us sick.

What is the relationship between a virus and its host cell?

- A. The host cell injects its DNA into the virus. B. The virus steals the host cell's machinery for its own purposes.
- C. The host cell creates and spreads many copies of itself to crowd out the virus. D. The virus kills the host cell as soon as it enters it.
4. Viruses often cause illness in humans. Some common viruses include those that cause chicken pox, the flu and the common cold. Some viruses may be latent, or dormant, for some time before they are reactivated. When we are infected with a virus, our bodies produce blood proteins called antibodies. The antibodies bind with and counteract that specific virus. Once the virus has gone away, the antibodies remain in your system, so you can't become infected with the exact same virus strain again. However, viruses are very smart. They can quickly mutate into a slightly different version of themselves. That means you can get sick with a cold over and over again.

Which of these statements explains why you can get the flu more than once in your life?

- A. Once they are in your system, flu antibodies mutate and reinfect you over and over. B. Once you become infected with the flu virus, you will cycle through periods of sickness and health for the rest of your life.
- C. Antibodies slowly lose their power over time. D. The flu virus can mutate, and the flu antibodies in your system are ineffective against new virus strains.

5. Some viral illnesses, like the common cold, are relatively mild. Most people's immune systems can fight off the virus and feel better in a few days. However, viruses can also cause more serious diseases like the measles, Ebola and AIDS. Scientists work continuously to reduce the spread of serious viruses. One important method of preventing infection is vaccines. Vaccines give people immunity from a virus without actively infecting them. They contain a weakened version of the virus that teaches the body to produce antibodies. Later, if you are exposed to that virus, your antibodies will prevent you from getting infected.

Medications called antivirals and antiretrovirals can help heal or slow the progression of some viruses once a person is infected. For example, medicines for the flu and HIV prevent the viruses from replicating. Researchers are working on other medications that interrupt different stages of viruses' life cycle.

Which of these is true about vaccines?

- | | |
|--|--|
| A. They prevent viruses from replicating once you are infected. | B. They are not effective at giving people immunity against a virus. |
| C. They cause the body to produce antibodies against a specific virus. | D. They cause the body to become actively infected with a mild form of a specific virus. |



Name _____ Date _____

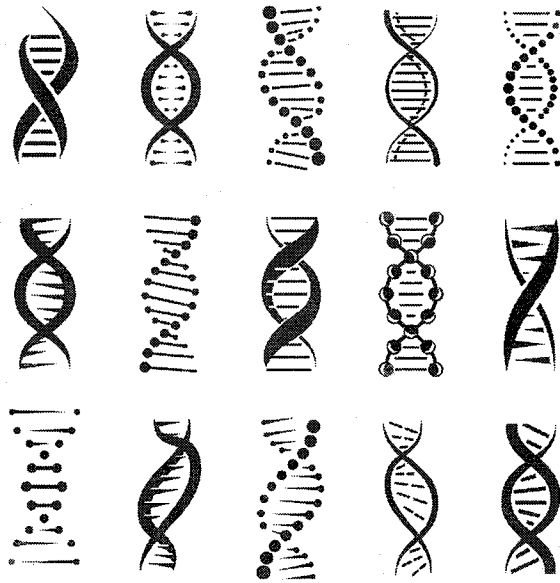
VIRUSES

PART I: In the spaces below, draw a helical, polyhedral and complex virus.

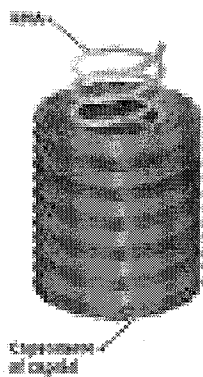
helical

polyhedral

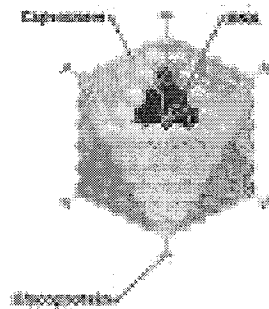
complex



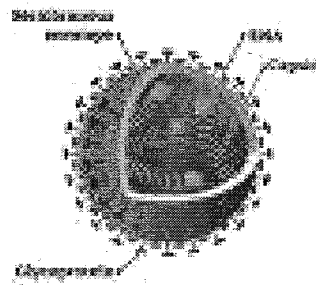
HELICAL



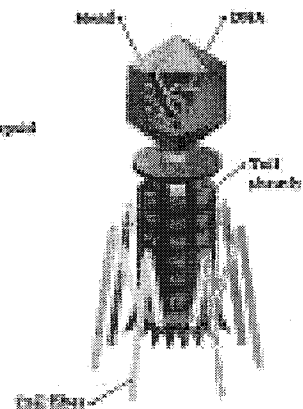
HELICAL
Tobacco
Mosaic Virus



POLYHEDRAL
Adenovirus



SPHERICAL
Influenza Virus



COMPLEX
Bacteriophage