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Newsela Science

Science for Texas Students

Aligned to TEKS

Why Now?

With the recent updates to the STAAR assessment, students will need to do the following to perform well on the Science assessment:

- Interpret graphs, charts, diagrams, and other visuals.
- Make inferences.
- Use academic language and make connections to real-world phenomena.

Why Newsela?

With our TEKS-aligned content and dedicated resources in Newsela Science, we can help teachers with thoughtful, engaging lessons that bring science concepts to life for students while simultaneously embedding literacy into their science instruction.

HIGHLIGHTS:

Brings science to life for students

Engages students with science lessons like Virtual Experiments with Phet and Exploring Data with Tuva, content, data activities and project-based learning opportunities that expose students to real-world science.

Engages all learners in scientific thinking

Integrates science and literacy to get all students reading and writing like scientists, with TEKS-aligned content and activities that promote science and literacy skills.

Aligned to TEKS

Gives teachers the content and lesson resources they need to drive science content knowledge and confidently implement TEKS.

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Instructional supports for each article

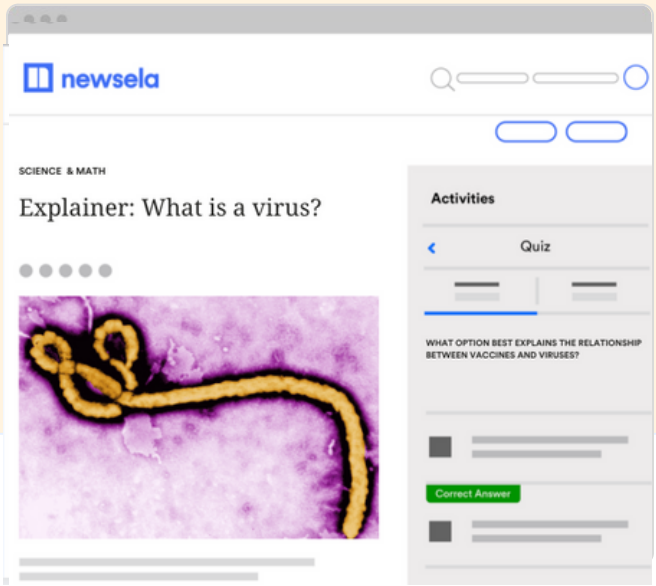
Help teachers expand students' learning experience and engagement

Curations, Lessons, and Customizations

Teachers can use Newsela to teach to the standards and priorities of their school and district. Create custom activities, search for content by standard, curate Text Sets, and control the reading levels students see.

Quizzes, Writing Prompts, and Assignments

Teachers can create and share customizable assignments and give students access to reading comprehension quizzes, customizable writing prompts, and annotations.



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Example Lesson Spark for Science

Are Germs Alive?

Time to Complete: Not Set

Overview
Students will explore the question "What constitutes a living thing?" by watching a video and reading articles that discuss the characteristics of living things and how there is some disagreement among scientists as to whether a virus is a living organism. They will complete this activity by creating a set of criteria to determine whether an unknown thing is a living organism.

This is a **paired-text lesson.** Assign students both of the following articles:

- A bug is making you miserable- is it alive?
- Explainer: What is a virus?

Activities
Before Reading
Think-Pair-Share: Ask students to think about and discuss the following with a partner:

- When did you have a disagreement with a friend or family member? How did you resolve the situation? Did you look for solid reasons or evidence to "back up" your point?

Explain that scientists often disagree and must research and experiment to collect evidence as well. In fact, arguing is very much a part of the scientific process!
Video: Next, show students the Ted.Ed animation **The Wacky History of Cell Theory** (6:10). As they watch, students should write down examples of scientists using evidence to support a theory.

Reading Instructions
For the article, **A bug is making you miserable- is it alive?**:

- Highlight in GREEN characteristics of a virus that support that it is a living organism. Highlight in RED the points that support the argument that a virus is not alive.

For the article **Explainer: What is a virus?**:

- Highlight in YELLOW information about how viruses are similar to other living things. Highlight in BLUE information about how viruses are unlike other living things.

After Reading
Write Prompt: Students will complete an independent writing assignment. Provide students with the following prompt:

- Imagine you are a biologist encountering an unknown object that may or may not be alive. How could you tell? Use your knowledge of the characteristics of living things to come up with a set of questions to test if your discovery is alive.

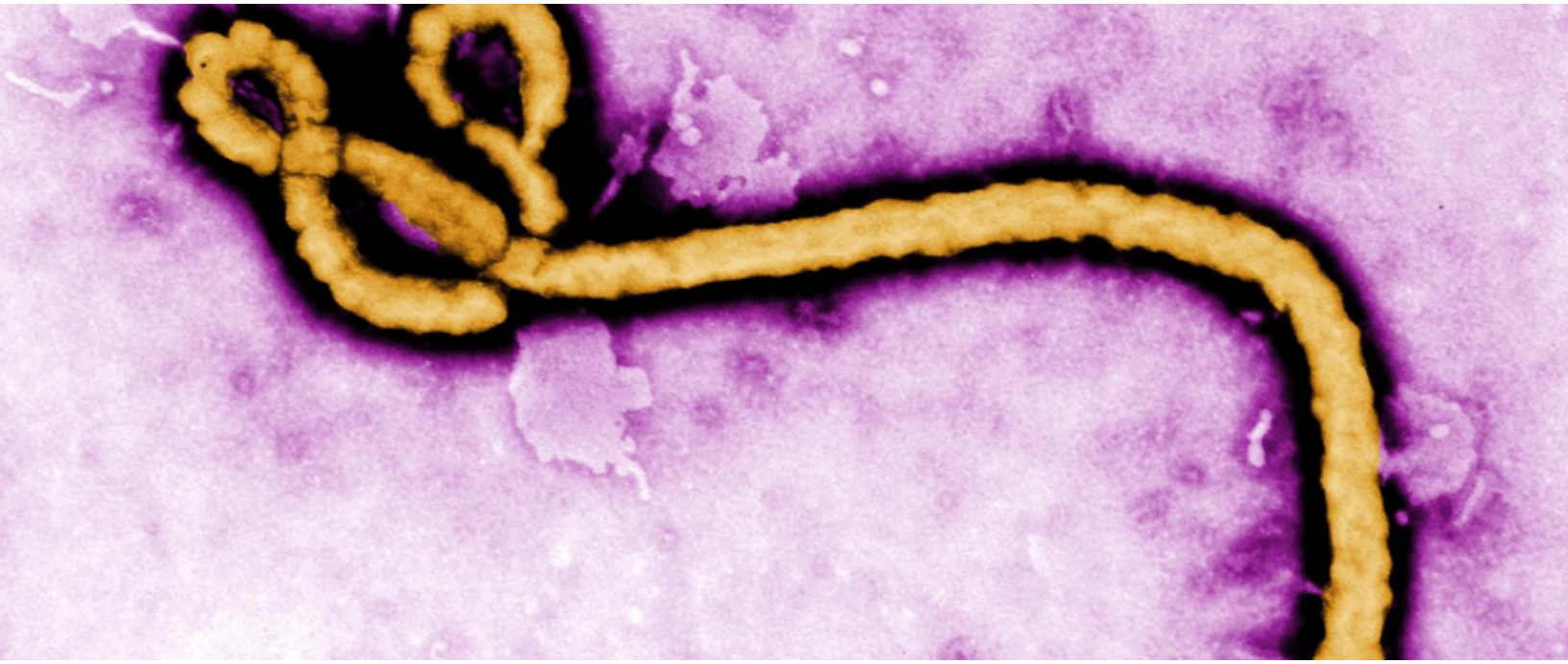
If time permits, student responses can be shared as a whole class to prompt a group discussion as to whether these criteria can be flexible. Note that in the case of viruses, there may not be agreement even among biologists.

ARTICLE

Science & Math

Explainer: What is a virus?

By Allen Cheng, The Conversation, adapted by Newsela staff. Published: 03/18/2020. Word Count: 773
Recommended for:Middle School - High School. Text Level: 6



This colorized transmission electron micrograph (TEM) revealed some of the ultrastructural morphology displayed by an Ebola virus viron. The largest ebola outbreak happened in West Africa from 2014-16. Photo from Wikimedia Commons

It may seem like something scientists should have figured out already. However, they are still arguing over whether viruses are a form of life.

There are many different kinds of viruses. Viruses cause everything from the common cold (called rhinoviruses) and warts (papillomavirus) to Ebola, a deadly disease that killed thousands in Africa. They are behind influenza and smallpox, another deadly disease that has been wiped out. Many viruses can also cause cancer. The hepatitis B virus, for instance, is a known cause of liver cancer.

Viruses show some of the characteristics of living things. They have DNA, which contains the instructions for how each part of a creature works. They also change over time and create copies of themselves. However, most biologists argue they aren't alive because they can't replicate themselves and create new viruses.

To say that viruses are small is an understatement. If the human genome were a 1,200-page book, the influenza virus would be about two words. The smallest virus, circovirus, would be merely a letter or two.

Essentially, viruses are snippets of DNA that take over the living cells to copy themselves. Then they escape the cell and spread. Viruses have what are called envelopes to protect their insides. Even those come from their hosts, or

the cells they take over. There is a good reason why a “computer virus” is called what it is.

Vaccines Are Developed To Stop Viruses
Vaccines can prevent viruses.

The word vaccine comes from the Latin word for “cow." The first vaccine, against smallpox, started with an observation by English scientist and doctor Edward Jenner. He noticed that milkmaids who had cowpox seemed to be protected from smallpox, a similar disease that came from cows. From this came the idea that a person could be protected with a closely related, but less dangerous, virus.

Scientists then found that even inactivated viruses worked. They enabled the immune system to protect the body from infection at a later date. An inactivated virus has been grown in a lab and then killed. Scientists then added these inactivated viruses into the vaccines that we get as shots when we visit the doctor. Vaccines have weak viruses inside them that are either living or
dead, but they can't reproduce themselves. When we get shot with vaccines it helps our bodies get used to them. Then, our bodies can defend themselves if we catch a live, strong virus.

The best vaccines have wiped out diseases, such as smallpox. Hopefully, in the near future, polio and measles will also become illnesses of the past.

Antivirals Are A More Recent Development
Antibiotics for treating bacterial infection were developed in the 1940s. Treatments for killing viruses are called antivirals, and they have been discovered more recently.

Most antiviral medication attempts to stop the virus from reproducing itself.

Some antivirals interfere with the way viruses enter or exit host cells. Others encourage the immune system to seek and destroy cells infected by viruses.

Mega-, Mimi- Or Truc?
Viruses can infect all living things, even bacteria.

J. Craig Venter, the biologist, was one of the first people to decode human DNA. Interestingly, he experimented on his own. He went around the world in his yacht taking samples of seawater. When his team examined the samples, they found an incredible number of new viruses, with about 10 million copies of viruses in each milliliter of water. It takes about 500 milliliters of water to fill a glass.

The recent discovery of new, very large viruses has also blurred the lines between what is and is not life. In 2003, the Mimivirus was found inside an amoeba in England. An amoeba is a one-celled creature. It was named the “microbe-mimicking virus” because it could be seen under a microscope and its DNA was as large as a small bacteria.

The largest known virus is the Pandoravirus, which was found in a pond in Melbourne, Australia.

These recent discoveries have led scientists to take another look at the nature and classification of life.

Didier Raoult, the French biologist who led the team that discovered Mimivirus, has even suggested putting giant viruses in a category called “truc.” This is French for “stuff,” as well as standing for things resist "complete classification." In other words, it means things that are too hard to categorize.

Do humans come from seawater viruses? More research may give answers to these and other interesting questions. Whatever the case, it is clear that these tiny parasites will always be problems for us to deal with.

Allen Cheng is an Associate Professor of Infectious Diseases Epidemiology at Monash University in Australia.