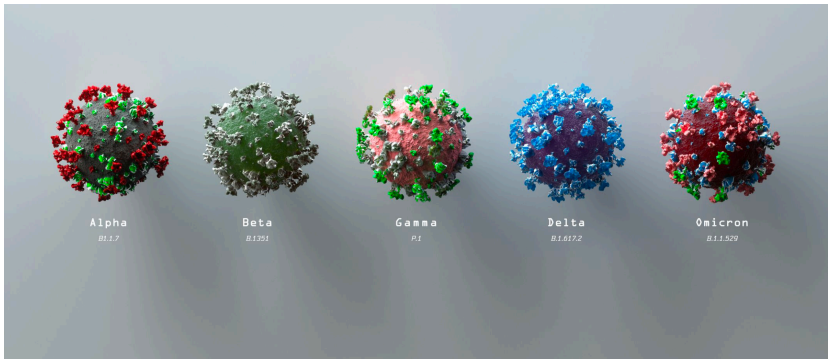
Title: Vaccine Unit, Lesson 2.5 Omicron and Variants



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Summary

Students learn about virus variants such as Omicron. This lesson is best taught as an extension of lesson 2, in which the hands-on model used to understand vaccines is adopted to make sense of variants.

Grade levels k-6

Resources

- Google Slides Grades k-6
- Student Reading
- Advice on Responding to Parental Concerns
- FAQ for parents
- Link to Lesson 1
- Link to lesson 2
- Link to Lesson 3
- Link to Lesson 4

Time for Lesson

- 60-75 minutes

Materials

- Beans or similar size objects (e.g. Marbles)
- Forks
- Radish seeds, quinoa, or similar sized grain
- Different grain of similar size, but with a different color (e.g. white instead of red quinoa, red rice, or pearl barley)
- Poppy Seeds
- Plates or trays
- Paper and tape
- Optional: pipe cleaners, tin foil

Lesson Prep

- Print Readings
- Prepare beans and grains by putting about **2 tablespoons of beans** and **1/4 teaspoon of the two different colors of quinoa and ¼ teaspoon of poppy seeds** for every group (partners are ideal for this activity) into separate cups.

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Teacher Background Knowledge

What You Need to Know

- New variants of the virus are expected to occur.
- Slowing the spread of the virus, by protecting yourself and others, can help slow the emergence of new variants.
- The Omicron variant causes more infections and spreads faster than the original SARS-CoV-2 strain of the virus that causes COVID-19.
- CDC is working with state and local public health officials to monitor the spread of all variants, including Omicron.
- Getting a vaccine reduces your risk of severe illness, hospitalization, and death from COVID-19. Staying up to date on your COVID-19 vaccines, which includes getting a booster when eligible, further improves your protection.

Variants Are Expected

Viruses constantly change through mutation and sometimes these mutations result in a new variant of the virus. Some variants emerge and disappear while others persist. New variants will continue to emerge. CDC and other public health organizations monitor all variants of the virus that causes COVID-19 in the United States and globally.

Scientists monitor all variants but may classify certain ones as variants being monitored, variants of interest, variants of concern and variants of high consequence. Some variants spread more easily and quickly than other variants, which may lead to more cases of COVID-19. Even if a variant causes less severe disease in general, an increase in the overall number of cases could cause an increase in hospitalizations, put more strain on healthcare resources and potentially lead to more deaths.

What We Know about Omicron

We are still learning about how easily it spreads, the severity of illness it causes, and how well available vaccines and medications work against it.

Spread

The Omicron variant spreads more easily than the original virus that causes COVID-19 and the Delta variant. CDC expects that anyone with Omicron infection can spread the virus to others, even if they are vaccinated or don't have symptoms.

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Symptoms

Persons infected with the Omicron variant can present with symptoms similar to previous variants. The presence and severity of symptoms can be affected by COVID-19 vaccination status, the presence of other health conditions, age, and history of prior infection.

Severe Illness

Omicron infection generally causes less severe disease than infection with prior variants. Preliminary data suggest that Omicron may cause more mild disease, although some people may still have severe disease, need hospitalization, and could die from the infection with this variant. Even if only a small percentage of people with Omicron infection need hospitalization, the large volume of cases could overwhelm the healthcare system which is why it's important to take steps to protect yourself.

Vaccines

COVID-19 vaccines remain the best public health measure to protect people from COVID-19 and reduce the likelihood of new variants emerging. This includes primary series, booster shots and additional doses for those who need them.

Scientists are still learning how effective COVID-19 vaccines are at preventing infection from Omicron. Current vaccines are expected to protect against severe illness, hospitalizations, and deaths due to infection with the Omicron variant. However, breakthrough infections in people who are vaccinated are likely to occur. People who are up to date with their COVID-19 vaccines and get COVID-19 are less likely to develop serious illness than those who are unvaccinated and get COVID-19.

Treatments

Scientists are working to determine how well existing treatments for COVID-19 work. Some, but not all, monoclonal antibody treatments remain effective against Omicron. Public health agencies work with healthcare providers to ensure that effective treatments are used appropriately to treat patients.

We have the Tools to Fight Omicron

Vaccines

Getting vaccinated and staying up to date with COVID-19 vaccines is the best way to protect yourself and others against the Omicron variant.

- CDC recommends that everyone 5 years and older protect themselves from COVID-19 by getting vaccinated. Everyone ages 12 years and older should stay up to date on their COVID-19 vaccines and get a booster shot when eligible.

Masks

Well-fitting masks offer protection against all variants.

- Wear a mask with the best fit, protection, and comfort for you.
- If you are not up to date with your COVID-19 vaccines and are aged 2 or older, you should wear a mask indoors in public.

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- In general, people do not need to wear masks when outdoors. In areas of substantial or high transmission, people might choose to wear a mask outdoors when in sustained close contact with other people, particularly if
    - They or someone they live with has a weakened immune system or is at increased risk for severe disease.
    - They are not up to date on COVID-19 vaccines or live with someone who is not up to date on COVID-19 vaccines.

Testing

Tests can tell you if you have COVID-19. Learn how to get tested.

- Two types of tests are used to test for current infection: nucleic acid amplification tests (NAATs) and antigen tests. NAAT and antigen tests can tell you if you have a current infection.
- Self-tests can be used at home or anywhere, are easy to use, and produce rapid results.
    - If your self-test has a positive result, isolate and talk to your healthcare provider.
    - If you have any questions about your self-test result, call your healthcare provider or public health department.

Emergence of Omicron

CDC has been using genomic surveillance throughout the course of the pandemic to track COVID-19 variants, and inform public health practice.

- November 24, 2021: A new variant of COVID-19, B.1.1.529, was reported to the World Health Organization (WHO). This new variant was first detected in specimens collected on November 11, 2021 in Botswana and on November 14, 2021 in South Africa.
- November 26, 2021: WHO named the B.1.1.529 Omicron and classified it as a Variant of Concern (VOC).
- November 30, 2021: The United States designated Omicron as a Variant of Concern.
- December 1, 2021: The first confirmed U.S. case of Omicron was identified.

Source: Adapted from Center for Disease Control, What you need to know about variants, https://www.cdc.gov/coronavirus/2019-ncov/variants/about-variants.html (Accessed 2/16/22); Center for Disease Control, Omicron variant: what you need to know, https://www.cdc.gov/coronavirus/2019-ncov/variants/omicron-variant.html (Accessed 2/16/22)

Lesson Instructions - Slides

Category	Slides	Description	Resource
Introduction	1	Tell students that you have heard talk/questions about a new kind of Coronavirus, and today we are going to be learning about them	Slides
Student Talk	2	Have students talk to each other and share if they have heard of either the term variant or Omicron. If they haven't ask if they can figure out what the word variant means. Have they heard words like “variety, variation or variable” before? In the whole class discussion, prompt students to try and uncover what the word variant means based off the similar sounding words.	Slides
Variant Definition	3	Say that variants are versions of the same things with slight differences between them.	Slide
Variant Examples	4	Many things have variants, like pencils. As you go through the animations on this slide, have students notice what are the slight differences between each pencil. Point out that even though the pencils are slightly different, they’re all still able to be used as a tool for writing with lead/graphite.	Slide
Variant Brainstorm	5	Brainstorm in groups or as a class other examples of things that have variants. Examples (dogs, cats, clouds, etc.)	Slide
Variant comparison	6	Say that viruses have variants as well. Like these two viruses. On the left is a picture of the original COVID-19 virus, on the right is a picture of the new COVID-19 variant. Ask the class if there are any similarities (They should say many, they look VERY similar.) Have students talk in pairs about any differences that they observe (there will be a shorter list, the spokes are slightly different shape and different colors) The point to make is that there are only SMALL changes in the variant of the viruses. Omicron is only a little bit different from the original virus. The slightly different Omicron virus is still a COVID-19 virus, it’s just a variant of it.	Slide
Many Different Variants	7	Say that whenever a virus spreads, it might change a little. Since COVID-19 has spread to so many different people it has changed many times. Some of the variants are especially dangerous and get names. These are the bad ones, like Delta which got people much more sick, or the most recent one, Omicron, which spreads really easily. Where do the names come from? Just like English has an alphabet (a,b,c,d,e,f,g…) other languages have alphabets as well, and the	slide

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		important variants are named after greek letters (some greek letters look like English letters, others look different). There will be more variants that will come about if COVID-19 continues to spread, that's why it is so important to get vaccinated to prevent the further spread of COVID-19	
Danger of Variants	8	When a virus changes sometimes it can become more dangerous or spread more easily even if that change is very minor. The next slides will give an analogy for how.	slide
Variants like changing clothes analogy	9-11	Even with a small change variants can become more dangerous and spread more easily. This is like when a criminal has changed clothes to make it harder for the police to be able to identify them from a wanted poster. Even though they are basically the same they are harder to catch. In this analogy the police are like the immune system, and they have a harder time catching COVID-19 who has changed its spikes.	slides
Review Activity	12-13	Review with students each part of the model from lesson 2. Make sure students understand that beans are like regular invaders, which the immune system can easily get out of the body, black quinoa is COVID-19 which the immune system **can't** easily remove, white quinoa is the vaccine which does not hurt your body and allows you the time to build a better immune system, and that after having built a better immune system the vaccinated fork should more easily remove the COVID-19 from the body.	slides
Omicron Model	14	Explain that we will be using poppy seeds to model the Omicron Variant of COVID-19. You can show students some poppy seeds and have them predict how easy it will be to remove.	slide
Pass out materials. Round 1 unvaccinated	15-16	Pass out materials including ¼ teaspoon of poppy seeds to each partner. Students are going to see how well they fare against omicron when they are unvaccinated. This is not supposed to be easy. Ask students what was harder to get out of their body, the original virus, or Omicron? It should be harder, because Omicron, though similar to the Original COVID-19 spreads even easier	slides
Use vaccinated immune system	17-18	Have students try again against Omicron, but using their vaccinated immune system that they made in lesson 2. Were they better able to get Omicron out of their body after being vaccinated than if they had not been vaccinated? How could they make their immune system work even better?	

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Booster shot	20	Especially if students are still struggling to get the Omicron out (many might be) ask whether they think getting a chance to improve their immune system even more might help them get the Omicron out. This is exactly why it's important for people to get another shot of vaccine (or a booster shot). You will allow students to get a booster shot to improve their immune system. Remind students that these vaccines will NOT harm you. Your immune system will have **time** to create an improved defense.	slide
Build improved immune system	21	Have students pour the vaccine on their body, and have students pick up their fork immune system. No need to start the timer this time, because the vaccine won't make you sick. You have time to build a new immunological tool. Pass out materials for students to build with (aluminum foil, tape, paper, paper clips, and pipe cleaners work well). Have students work together to build tools to pick up the white quinoa. Tell students that they are engineers and that engineers constantly test and revise their inventions. They can build something, try it, and change it to make it better. Give students 10-15 minutes to create and refine their designs. Debrief: Were you able to make something?? Your immune system needs time to figure out how to fight the virus, that's why scientists came up with a vaccine which can be in your body without harming you and give you time to make a defense If students are struggling to make their immune system work, suggest that they put a piece of tape on one side of their forks, this is one of the most effective tools that we have observed students come up with. Picture example	slide
Round 3: Re-infect with "coronavirus"	22	Now that your body knows what to do, you are ready to fight the omicron coronavirus again. Have students pour the poppy seeds coronavirus back on their body/plate. Have students pick up their vaccinated immune system (the immunological tool that students developed). Start the timer and have students try to get the coronavirus out of their body as quickly as possible. For younger students give them more time to get the virus out (wait until at least one group is healthy) Debrief: Did everyone stay healthy? What happened? How was this different from the first time your body had to fight the coronavirus? Even if you weren't completely healthy, did you do better than the first time? If you were given another booster shot (more time to train your immune system) would you do even better?	slide
Clean Up	23	Have students clean up their area.	slide

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Stop Variants with vaccines	24	Ask students, what was worse, the original COVID-19 or the Omicron? Remind students that variants come about the more COVID-19 spreads. By getting vaccinated and wearing masks we can prevent the spread, and make it less likely that an even more dangerous variant arises.	slide
Video	25	The video summarizes the information that this lesson covers	Slide Youtube link
Grades 3-6 Reading	26	This reading provides more in depth information about Omicron	Slide Reading Link
Extension Video 6th grade	27		Slide Youtube link

Primary Modifications

- K-2 Worksheet
- 3-4 worksheet
- Show students some ideas for building their immunological tools

Intermediate Modifications

- 3-4 worksheet
- 5-6 worksheet
- Have students count the remaining quinoa on the plate to determine how sick they got before and after the vaccine (slides 33-34)

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