Rewind, Reflect, Fast-Forward

Key Events and Personal Impacts of the COVID-19 Pandemic

COVID HACKS
Healthy Actions • Community Knowledge • Science

FOR GRADES
9–12

OVERVIEW

Students will compile key events in the COVID-19 pandemic timeline, learn where to find accurate national and state COVID-19 statistics, and reflect on how the pandemic has affected their lives.

LEARNING OBJECTIVE

Students will be able to identify key events in the COVID-19 pandemic timeline; identify what they want to learn about the virus, the pandemic, and public health efforts; reflect on personal impacts of the pandemic, both negative and positive; and summarize what they already have learned about the virus and its effects (optional).

SCIENCE, HEALTH AND MATH SKILLS

- Comparing and contrasting
- Interpreting information

NGSS SCIENCE AND ENGINEERING PRACTICES

- Asking questions and defining problems
- Developing and using models
- Analyzing and interpreting data

TIME

- Set Up: 15 minutes
- Activity: 45 minutes

MATERIALS FOR SCIENCE INVESTIGATION

- Digital or paper versions of Student Sheet A (has three sections)
- Internet access for student research
- Rewind, Reflect, Fast Forward slide deck (www.bioedonline.org) for use by teacher to guide student discussion on second day two

SET UP AND TEACHING TIPS

This activity asks students to look back to spring 2020 during the initial phases of the COVID-19 pandemic and trace its development. Students will follow the instructions on the accompanying Student Sheet A to “rewind” back the initial phases of the pandemic, “reflect” on its impact on themselves and others and “fast-forward” to the future. A set of PowerPoint slides is included for you the teacher to use during the next day, when discussing students’ responses to the “rewind” portion of their assignment.

PROCEDURE

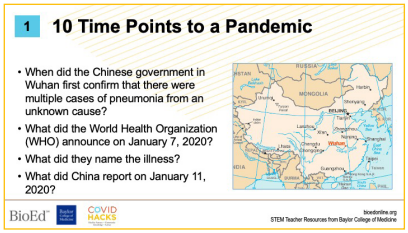
ENGAGE AND EXPLORE

1. Ask students when they think the COVID-19 pandemic began. Accept all answers.
2. Tell students that you want them to "rewind" back to when the pandemic began and identify some key dates along the timeline so far. Also ask them to think about things they would have done in the past few months that might have been different if there were no pandemic.
3. Ask students to complete the Rewind, Reflect, and Fast-Forward student activity sheet, including all questions, before the next class. You also can ask them to complete the COVID-19 KWL sheet before class or after class (optional).

EXPLAIN

4. Use the accompanying slides to review what students learned in their Rewind, Reflect, Fast-Forward activity sheet exploration. If students raise a question for which you do not have an answer, have them add it to their "what I want to know" lists. You can suggest a possible online source for the information (e.g., CDC, NIH, public health site, journal article, etc.)

SLIDE 1



How did we end up here?

As noted in your activity sheet, the last six months have been vastly different from most years. Dealing with the coronavirus has become a central focus in many people's lives: avoiding getting infected; dealing with an infection; figuring out how to manage life, work and school during a pandemic; or trying to figure out how to treat the disease and prevent it in our homes, community, nation, and world. Your assignment asked you to "rewind" the timeline and go back to where the pandemic started.

- *When did the Chinese government in Wuhan first confirm that there were multiple cases of pneumonia from an unknown cause?*
  Answers are provided in brackets, the answer for this prompt is: [December 31, 2019.]

Note: If students ask whether the virus was manufactured by someone to create the pandemic, you can tell them that, despite many online rumors, the U.S. Centers for Disease Control and Prevention (CDC) have reported that epidemiologists collected many specimens in China from hospitals, patients, and animals that can carry coronaviruses. It appears likely that the virus transferred to humans through contact with an animal, possibly a bat.[1] There is evidence that the version of the virus that infects humans also is related to a coronavirus that has been identified in pangolins.[2] This is called a "zoonotic" pathogen because it moves from animals to humans. The World Health Organization reported that the virus' genome does not have the markers of a "laboratory construct," that is, it was not created in a laboratory.[3]

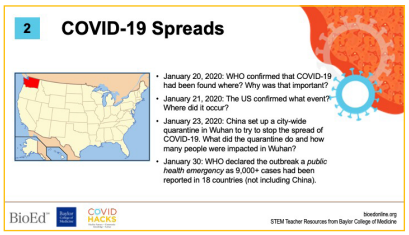
1 Centers for Disease Control (CDC). 2020. Identifying the source of the outbreak. https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/about-epidemiology/identifying-source-outbreak.html. Mallapaty, Smriti. 2020. Wildlife trade should be focus of pandemic origins investigations. Nature 583(344). https://www.nature.com/articles/d41586-020-02052-7.

2 Li X, Giorgi E, Marichannegowda M, Foley B, Xiao C, et al. 2020. Emergence of SARS-CoV-2 through recombination and strong purifying selection. Science Advances 6(27). https://advances.sciencemag.org/content/6/27/eabb9153.

3 World Health Organization (WHO). 2020. Coronavirus disease 2019 (COVID-19) Situation Report – 94. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200423-sitrep-94-covid-19.pdf?sfvrsn=b8304bf0_4.

- *What did the World Health Organization (WHO) announce on January 7, 2020?* [They identified a new coronavirus as the cause of an outbreak of infectious respiratory illness in Wuhan, China.]
- *What did they name the illness?* [On February 11, they named the illness COVID-19 for "Coronavirus disease 2019".]
- *What COVID-related news did China report on January 11, 2020?* [The first death attributed to COVID-19.]

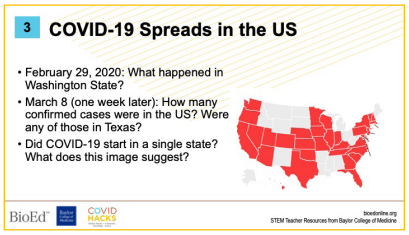
SLIDE 2



COVID-19 Spreads

- *On January 20, 2020, the WHO confirmed that COVID-19 had been found where?* [Why was this news important? [Thailand, Japan, and South Korea. The disease was no longer contained in China.]
- *What did the U.S. confirm on January 21, 2020, and where did the event occur?* [The first case in the U.S. was confirmed on January 21, 2020 in Washington state.]
- *On January 23, China set up a city-wide quarantine in Wuhan to try to stop the spread of COVID-19. What did the quarantine do and how many people were impacted in Wuhan?* [The quarantine affected the 11 million citizens of Wuhan, who could not travel to or from the city. It also meant that all buses, subways, and ferries were shut down to limit travel around the city. People were encouraged to stay home.]
- On January 30, the WHO declared the outbreak a public health emergency, as more than 9,000 cases had been reported in 18 countries (not including China).

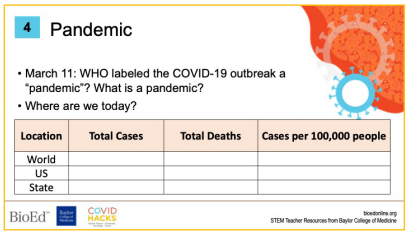
SLIDE 3



COVID-19 Spreads in the US

- *What COVID-related event happened on February 29, 2020 in Washington state?* [First U.S. COVID-19 death was in Seattle, Washington, February 29, 2020.]
- *A week later (March 8), how many confirmed cases were in the US? Were any of those cases in our state?* [The U.S. topped 500 confirmed cases by March 8; 22 of those cases were in Texas, for example.]
- *Does this March 8 news about states where people were ill with COVID-19 suggest that COVID-19 started in a single state or had it affected people in many states by March 2020?* [Many states saw COVID-19 cases in about the same timeframe. There probably were multiple points of entry of SARS-CoV-2 into the US.]

SLIDE 4



Pandemic

- *On March 11, the WHO labeled the COVID-19 outbreak a "pandemic"? What is a pandemic?* [A pandemic is the worldwide spread of a new disease for which most people do not have immunity.]
- *Where are we today?* [Go to https://covid.cdc.gov/covid-data-tracker/#cases and https://covid19.who.int/ and fill in current numbers for the world, US and Texas below. Note that the WHO reports in cases per million, not cases per 100,000, so you will need to divide the WHO number by 10.]

Total Cases

- World: _____
- US: _____
- State: _____

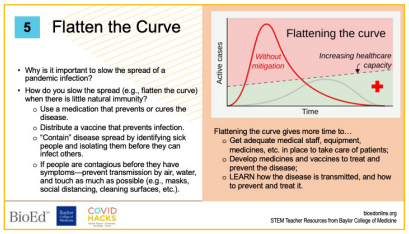
Total Deaths

- World: _____
- US: _____
- State: _____

Cases per 100,000 People

- World: _____
- US: _____
- State: _____

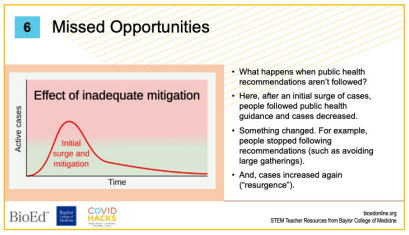
SLIDE 5



Flatten the Curve

- *Why is it important to slow the spread?* [As COVID-19 began spreading across the U.S., elected and appointed officials, public health staff, infectious disease physicians, scientists and school boards collaborated to establish strategies to slow the spread of the virus. During the initial spread of a disease, people may need more medical care, medicines, or special medical equipment than can be provided immediately. We saw this happen in many countries, including the U.S. At the start of the COVID-19 pandemic, there were not enough respirators for patients in some cities, and inadequate supplies of protective gear for medical staff. National and local public health agencies asked everyone to help slow the rate of new COVID-19 cases by wearing cloth masks (instead of medical masks), washing their hands, and social distancing. Slowing the rate of new cases gives medical personnel time to learn better ways to treat the disease, researchers time to work on vaccines and medicines, and public health officials time to learn how the disease spreads (e.g., touch, air, water, etc.).
- *Remember the calls to "flatten the curve"? What did that mean?* [Look at the animation on this slide. The number of cases of an infectious disease like COVID-19 will rise quickly without any mitigation (that is, without strategies to reduce the disease spread). Without effective medication or a vaccine for COVID-19, preventative strategies such as masks or social distancing were our most important mitigation strategies.]

SLIDE 6



Missed Opportunities

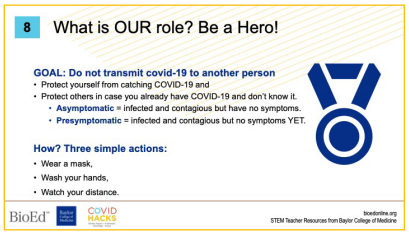
- *What happens when people don't follow public health? recommendations?* [Look at this slide. After an initial surge of infectious disease cases, the number of cases decreased when people followed public health orders like wearing face coverings and social distancing. But soon, people became tired of following the rules and the number of cases increased again. This is called a "resurgence."]

SLIDE 7

When will it end? How do pandemics end?

- Enough people develop natural immunity. This happened after the 1918 influenza pandemic, but at a terrible cost. 50–100 million people died and the H1N1 virus that caused it continued to infect people 40 years later. Look at this slide.
- Containing the virus. The last coronavirus we encountered was SARS-CoV. People infected with the SARS-CoV virus got sick very quickly, so they didn't spread it before they knew they were infected. Sick patients could be isolated until they recovered. There were only about 8,000 SARS cases globally and less than 800 deaths. The last case was 2004.
- Develop and distribute a vaccine. When scientists in 2009 saw a new H1N1 virus emerge (called swine flu), they moved quickly to develop a vaccine for it. Luckily, the 2009 virus was not as contagious as the 1918 virus, and the vaccine controlled the spread of the virus. Now, protection against H1N1 is a component of the annual flu vaccines that are updated and distributed each year.
- *How will the COVID-19 pandemic end?* Masks, hand washing, and social distancing can slow the spread of the virus while vaccines are being developed and distributed.

SLIDE 8



What is our role?

- The role of <u>every</u> person is to <u>not transmit COVID-19 to another person</u>. *How?* [(1) Protect yourself from catching COVID-19; and (2) protect others in case you already have COVID-19 and don't know it. Yes, you can be infected and spread the virus even if you have <u>no</u> symptoms. That condition is referred to as being"asymptomatic." You also can get infected and spread the virus <u>before</u> you start showing symptoms. That is called "presymptomatic." Both conditions are reasons you must protect others even if you feel healthy. *What are some strategies that are known to help prevent transmission of the virus that causes COVID-19?*
- Three simple actions: Wear a mask, wash your hands, and watch your distance. These actions are not fun, but they ARE essential. If we follow these three steps, the virus spread slows, we get time to develop and distribute a vaccine, and our friends and family do not become ill. Once vaccines become available, be sure to become vaccinated.

There is evidence that the version of the virus that infects humans also is related to a coronavirus that has been identified in pangolins.[2] This is called a "zoonotic" pathogen because it moves from animals to humans. The World Health Organization reported that the virus' genome does not have the markers of a "laboratory construct."

EXTEND

5. Students can share what they know and want to know via a submitted assignment, online bulletin board, or discussion. Note that you (the teacher) can select specific questions for students to answer, rather than assigning all the questions.

EVALUATE

6. Have students submit the rewind section of Lesson 1 as homework. They should be allowed to keep their personal reflections (reflect and fast-forward) private.

RESOURCES

- Centers for Disease Control and Prevention (www.cdc.gov). The CDC is a U.S. federal agency that works to protect America from health, safety and security threats, both foreign and in the U.S. by conducting critical science and providing health information. The CDC is the main U.S. repository for COVID-19 case data.
- World Health Organization (www.who.int). WHO is an international health agency with more than 7000 people from more than 150 countries working in 150 country offices. WHO's mission is to promote health, keep the world safe, and serve the vulnerable. It is the main repository of worldwide COVID-19 case data.
- Denworth, Lydia. 2020. What Comes Next. Scientific American 322(6):44–45. https://www.scientificamerican.com/article/how-the-covid-19-pandemic-could-end1/.
- Gavin, Kara. 2020. Flattening the Curve for COVID-19: What Does it Mean and How Can You Help?. University of Michigan Wellness & Prevention Health Blog. https://healthblog.uofmhealth.org/wellness-prevention/flattening-curve-for-covid-19-what-does-it-mean-and-how-can-you-help.

COVID HACKS
Healthy Actions • Community Knowledge • Science

COVID HEALTHY ACTIONS, COMMUNITY KNOWLEDGE AND SCIENCE

A SCIENCE-BASED CURRICULUM FOR THE COVID-19 PANDEMIC

We are grateful to Laura and John Arnold and other community donors for their generous support, which enabled development of the COVID HACKS curriculum materials. We also thank the many scientists, educators and physicians from Baylor College of Medicine (BCM) who provided content, feedback and technical reviews.

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STUDENT PAGE A

Coronavirus — Rewind, Reflect, Fast-Forward

COVID HACKS
Healthy Actions • Community Knowledge • Science

LEARNING OBJECTIVES

- Identify key events in the COVID-19 pandemic timeline
- Summarize what you have already learned about the virus and its effects
- Identify what you want to learn about the virus, the pandemic, and public health efforts
- Reflect on the personal impacts of the pandemic, both negative and positive

PART 1

REWIND

Most of the year 2020 has been vastly different from any other year. For many people, dealing with the coronavirus has raise questions like: how does we avoid becoming ill; deal with an infection ourselves or an infected family member; how do we access testing; *when will a vaccine be available widely? How did we end up here?* First, let's rewind, and look back at how the world became encircled by a disease outbreak. Use one of the following timeline to track some of the key events of the pandemic for U.S. residents.

- NBC News
  https://www.nbcnews.com/health/health-news/coronavirus-timeline-tracking-critical-moments-covid-19-n1154341.
- World Health Organization (WHO)
  https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline.
- New York Times
  https://www.nytimes.com/article/coronavirus-timeline.html.

TEN TIME POINTS TO A PANDEMIC (fill in the empty cells)	
1. When did the Chinese government in Wuhan, China confirm that there were multiple cases of pneumonia from an unknown cause?	
2. On January 7, the World Health Organization (WHO) identified a new coronavirus as the cause of the illness. On February 11, they named the illness COVID-19 for "Coronavirus disease 2019."	
3. What did China report on January 11, 2020?	

4. On January 20, 2020, the WHO confirmed that COVID-19 had been found where? Why was that important?	
5. What did the U.S. confirm on January 21, 2020, and where did it occur?	
6. On January 23, 2020, China set up a city-wide quarantine in Wuhan to try to stop the spread of COVID-19. What did the quarantine do and how many people were impacted in Wuhan?	
7. On January 30, the WHO declared the outbreak a public health emergency as more than 9,000 cases had been reported in 18 countries (not including China).	
8. What key COVID-related event happened on February 29, 2020 in Washington state	
9. How many confirmed cases were there in the US one week later (March 8)? Were any of those cases in Texas?	
10. On March 11, 2020, the WHO labeled the COVID-19 outbreak a "pandemic"? What is a pandemic?	

WHERE ARE WE TODAY? (fill in the blank line)

Go to the following website and fill in the current numbers for the US and your own state below.

- https://covid.cdc.gov/covid-data-tracker/#cases

Go to the following website to find number for the world.

- https://covid19.who.int

Total Cases	Total Deaths	Cases Per 100,000 People
• World: _____	• World: _____	• World: _____
• US: _____	• US: _____	• US: _____
• My State: _____	• My State: _____	• My State: _____

PART 2

REFLECT

As COVID-19 began spreading across the U.S., elected and appointed officials, public health staff, infectious disease physicians and scientists, and school boards collaborated on guidelines and timelines to try to slow the spread of the virus. *Remember the calls to "flatten the curve"?* Refresh your memory with a quick look (or listen) to this University of Michigan Med School blog/podcast

- https://healthblog.uofmhealth.org/wellness-prevention/flattening-curve-for-covid-19-what-does-it-mean-and-how-can-you-help

Allowing the virus to "run amok" means a lot of people are sick at the same time. As we saw when the pandemic started, hospitals in the U.S. and other countries didn't have enough beds, ventilators, medications, staff, or protective gear to deal with all the COVID-19 patients, especially with so many in critical condition. We had to "flatten the curve," that is, slow the spread of the virus within communities and between communities so that health care facilities could keep up with the need for medical care. Flattening the curve also gives researchers time to find medications to treat COVID-19 and to develop vaccines for the virus that causes it (SARS-CoV-2). The COVID-19 pandemic became a community undertaking when it became clear that we all had to work together for the common good.

REFLECTION QUESTIONS

Think about the questions below and write your answers in the space provided.

1. List some events, activities, hobbies, etc. that you have not been able to do or attend during the pandemic. What has been the hardest thing about missing these events and milestones?

2. List some people you have not been able to visit or spend time with in-person. What has been the hardest thing about social distancing from people with whom you want to spend time?

3. Many people have found that social distancing restrictions have given them time to do things they normally don't have time to do, such as hobbies, talking or gaming with friends and family, reading ,or learning a new skill (such as baking, woodwork, mechanical repair, computers or a fitness). What activities or projects have you done during the pandemic that have benefited you?

PART 3

FAST-FORWARD

When will this be over? We all want to fast-forward to the day when the COVID-19 pandemic is a historical event, not our daily concern. *How are we going to get there?* As we are learning, this must be a community effort.

- Researchers are working 24/7 on vaccines and treatments, and on research about the virus and how it spreads. The U.S. vaccine initiative is called "Warp Speed" and scientists are, indeed, working as fast as possible to create safe and effective vaccines to stop COVID-19.
- Public health workers are in the field, helping find people who may have been exposed to individuals with COVID-19, so infected people don't expose others in turn.
- Medical personnel are learning the best ways to treat COVID-19 patients and sharing what they learn with scientists and clinicians around the world.
- Thousands of businesses have modified their buildings, and manufacturing and shipping processes to keep their employees safe while producing and shipping all the things we need, from food and clothing, medicine and technology. Some businesses have transformed into medical equipment manufacturing plants to provide critical equipment to hospitals and nursing homes.
- Millions of workers are on the job to keep all of the "wheels" turning: lights, power, water, sewage treatment, refuse collectors, grocery stores, drug stores, restaurants (and the companies that bring food to the grocery stores and restaurants), food and drug manufacturers, transportation companies, radio/television/cable news and entertainment, Internet service providers, and more.

WHAT IS YOUR ROLE IN YOUR HOME, CIRCLE OF FRIENDS, AND COMMUNITY?

Every person has one essential role in this pandemic: don't transmit covid-19 to another person. To do that, you must (1) protect yourself from catching COVID-19, and (2) protect others in case you already have COVID-19 and don't know it. Yes, you can be infected and spread the virus even if you have no symptoms. That is called "asymptomatic." You also can get infected and spread the virus before you start showing symptoms. That is called "presymptomatic." Both conditions are reasons you must protect others even if you feel healthy. *How?* Three simple actions: wear a mask, wash your hands, and watch your distance. These steps are not fun, but they are essential.

WHAT HAPPENS IF WE DON'T TAKE THESE STEPS?

On April 10, the WHO warned that prematurely lifting "stay home" restrictions could dramatically increase COVID-19 infections, causing spikes in the number of cases. We have seen this happen around the U.S. and in other countries, particularly after large events or family gatherings, with few social distancing precautions. U.S. colleges are struggling this fall with increased COVID-19 cases as returning students ignore restrictions and attend large parties. These events affect all of us because they continue the spread of COVID-19.

WHAT HAPPENS IF WE DO FOLLOW THE GUIDELINES?

Things get better faster. Fewer COVID-19 cases lead to fewer restrictions. And, ultimately, a vaccine will protect us from future COVID-19 infections.

DO ONE LAST REFLECTION

Close your eyes and imagine that it is May 2021. People really stepped up and followed the guidelines in your community. COVID infections are pretty rare now and the vaccine is working. The economy is better. You are back in school or college, ready to finish the year. *What are three things you are looking forward to doing next spring and summer?*

1.

2.

3.