

A nurse prepares the J.E vaccine to administer to students at a health clinic, Bart Ver Weji, 2015, Funsacion Princesa de Asturias

Google Arts & Culture

A Brief History of Vaccination

Lesson plan
created with



Introduction

A Brief History of Vaccination

Join us as we learn about vaccinations, including its history and how vaccinations have helped the fight against several life threatening diseases.

This lesson is designed to support you as you explore Google Arts & Culture stories related to the lesson topic. It is suitable for anyone, but is recommended for students aged 11-16 years.

You can complete the lesson on your own working at home, with a group of friends, or in your classroom. It is designed so that you can work through it at a pace that suits you.

If you get stuck, you can talk to a teacher or parent.

Throughout the lesson you will find tasks to complete and questions to answer, so when you reach the end you will have used a range of skills to create something on your own that demonstrates your knowledge and understanding of the topic.

All you need to get started is any device with Internet access.

Are you ready to learn more about vaccinations and how they have been used to combat diseases and viruses?

Things you'll need to complete this lesson.



Tablet, laptop, or computer with access to the internet.



Paper, or a notebook, and pen to make notes as you go.



Drawing materials such as coloring pens and pencils, paper etc.



Scissors, glue, scrap paper, and general stationery items.



Art materials, specifically paints and brushes.



A printer would be beneficial but not essential – why not draw instead?

Explore & Discover

A Brief History of Vaccination

What can you expect to learn?

In this lesson you will gain an appreciation of the role vaccines have played in fighting several life threatening diseases. Discover the history of vaccinations from smallpox to Covid-19, and explore how Arts & Culture can help in a global pandemic.

Activities to complete

1. Produce a timeline showing the history of vaccinations.
2. Use six words to describe either vaccination or Covid-19.
3. Learn about the healing breath technique to help you with your wellbeing.
4. Design a protective mask.
5. Have fun experimenting with the Blob Opera from Google Arts & Culture Experiments.

Outcomes you will achieve

- Discover how over time vaccinations have been used to help fight diseases.
- Learn about viruses and their impact on humanity.
- Discover the incredible world of bacteria, how they infect us, and how the weapons we use to fight these are becoming less effective.
- Explore the story behind the Covid-19 pandemic.
- Appreciate the impact the pandemic had on health workers during the pandemic.
- See and hear how Arts and Culture can be used to support people during a global crisis.

Look out for the following tips which tell you what to do when doing the lesson.



Key information to remember and to help guide you through the lesson.



Estimated time to complete a section or activity within the lesson.



Optional headphones to listen to videos and audio recordings.



Explore online content. Discover videos, stories, and zoom into pictures.



Activity - time to design, make or write something of your own.



Vocabulary

Words to look out for in the lesson

antibiotics, antibodies, antigen, bacteria, bacteriologist, cholera, contaminate, Covid-19, dose, electron microscope, endemic, engineer, epidemic, eradicate, factory-in-a-box, genes, germs, healing, health worker, healthcare, herd immunity, hospital, hygiene, immune, immunize, infection, inoculate, intracerebral, isolation, manufacture, medicine, microorganisms, mould, Nobel Prize, organ, organism, outbreak, pandemic, pathogen, pavilion, penicillin, physician, plague, plasma, polio, PPE, prevention, pustule, quality control, rabies, remedy, replicate, reproduction, RNA, segregation, separation, septic, serum, smallpox, Spanish Flu, spike, protein, sterilization, superbug, surgical face mask, symptom, syringe, treatment, tuberculosis, typology, vaccination, vaccine, variolation, vial, virus, ward, wellbeing, World Health Organization

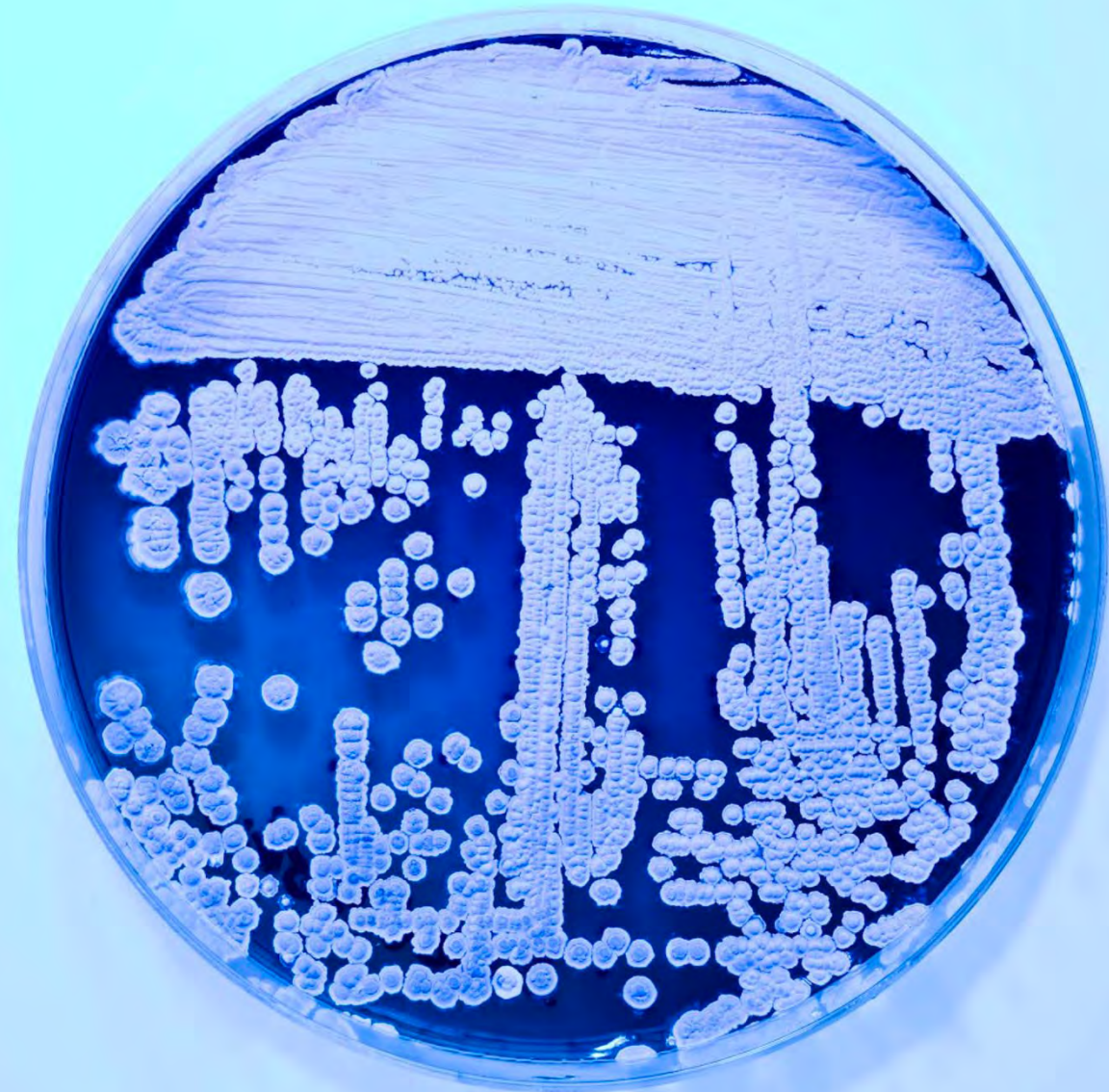
A Brief History of Vaccination

Introduction

- Epidemics – how people coped before vaccines.
- Vaccines – what are they? How were they developed? What was the first one?
- Louis Pasteur's work - was it important? Principles of vaccination – foundations of hygiene, public health, and modern medicine.
- Discover more about the Covid-19 pandemic.
- How are vaccines mass produced?
- The impact of health workers.
- Appreciate how art can help with wellbeing.
- Learn about different protective mask solutions for various cultures around the world.



If you make notes on the stories you read, this will help you for the end of lesson quiz.





[Influsplit Tetra, Deutsches Museum/A. Göttert, 2020, Deutsches Museum](#)

What is this lesson about?

In this lesson you will learn about vaccinations, including their history and how vaccinations have helped with the fight against several life threatening diseases.



This lesson will take around 120 minutes.



[Vaccination kit, Deutsches Museum, 2018, Deutsches Museum](#)

History and Development

An overview of the history of vaccinations from smallpox to Covid-19. Learn about viruses, bacteria, and how people coped with epidemics in the past.



This chapter will take around 40 minutes.



[Edward Jenner vaccinating a boy \(painting\), E.-E. Hillemaier, 1884, Canada Science and Technology Museum](#)

Edward Jenner

Discover the story of Edward Jenner, a British physician and scientist who pioneered the concept of vaccines.



[Louis Pasteur in his laboratory. Albert Edelfelt, 1886, Institut Pasteur](#)

Louis Pasteur

Learn the story of Louis Pasteur and how his search for a cure for Rabies led to the first laboratory-produced vaccine.



[Flu vaccine being injected, Museum of Engineering Innovation](#)

Key Discoveries

Discover how immunisation has been used to fight germ attacks for centuries.



[Colony of E. coli bacteria, Science Museum](#)

Superbugs

Learn about superbugs and how researchers are working to create new and more effective ways to combat antibiotic resistance.



Autographed (in plate) engraving. Edward Jenner, 1838, Science Museum

Edward Jenner (1749 – 1823)

English physician and scientist who pioneered the concept of vaccines

The practice of immunisation dates back hundreds of years. From as early as the 15th century, attempts have been made to prevent illness by deliberately infecting a healthy person with a disease in the hope that a mild, but protective, infection would result - a practice known as variolation. However, the real story of vaccines begins with English country doctor Edward Jenner who, in 1796, discovered that injecting cowpox viruses into humans immunised them against smallpox.

At the time when Jenner was conducting his early experiments, smallpox was a highly infectious disease which killed in large numbers and had an especially high fatality rate amongst young children. Jenner's methods underwent medical and technological changes over the next 200 years, and eventually resulted in the eradication of smallpox.

Click on the 'Explore' button to learn more about Jenner's pioneering work and discover the story behind these life-saving jabs.



[Explore](#)

Louis Pasteur (1822 – 1895)

Finding a Cure for Rabies

Louis Pasteur was a French chemist and microbiologist whose research into the causes and prevention of diseases laid the foundation of modern preventative medicine. Influenced by the work of Edward Jenner, Pasteur surmised that if a vaccine for smallpox had been found, then a vaccine could be found for all diseases.

Pasteur believed that rabies, a fatal disease generally transmitted by animal bites, was caused by bacteria (later discovered to be a virus) that was too small to be seen under Pasteur's microscope. As a result, Pasteur's experiments demanded the development of entirely new methods.

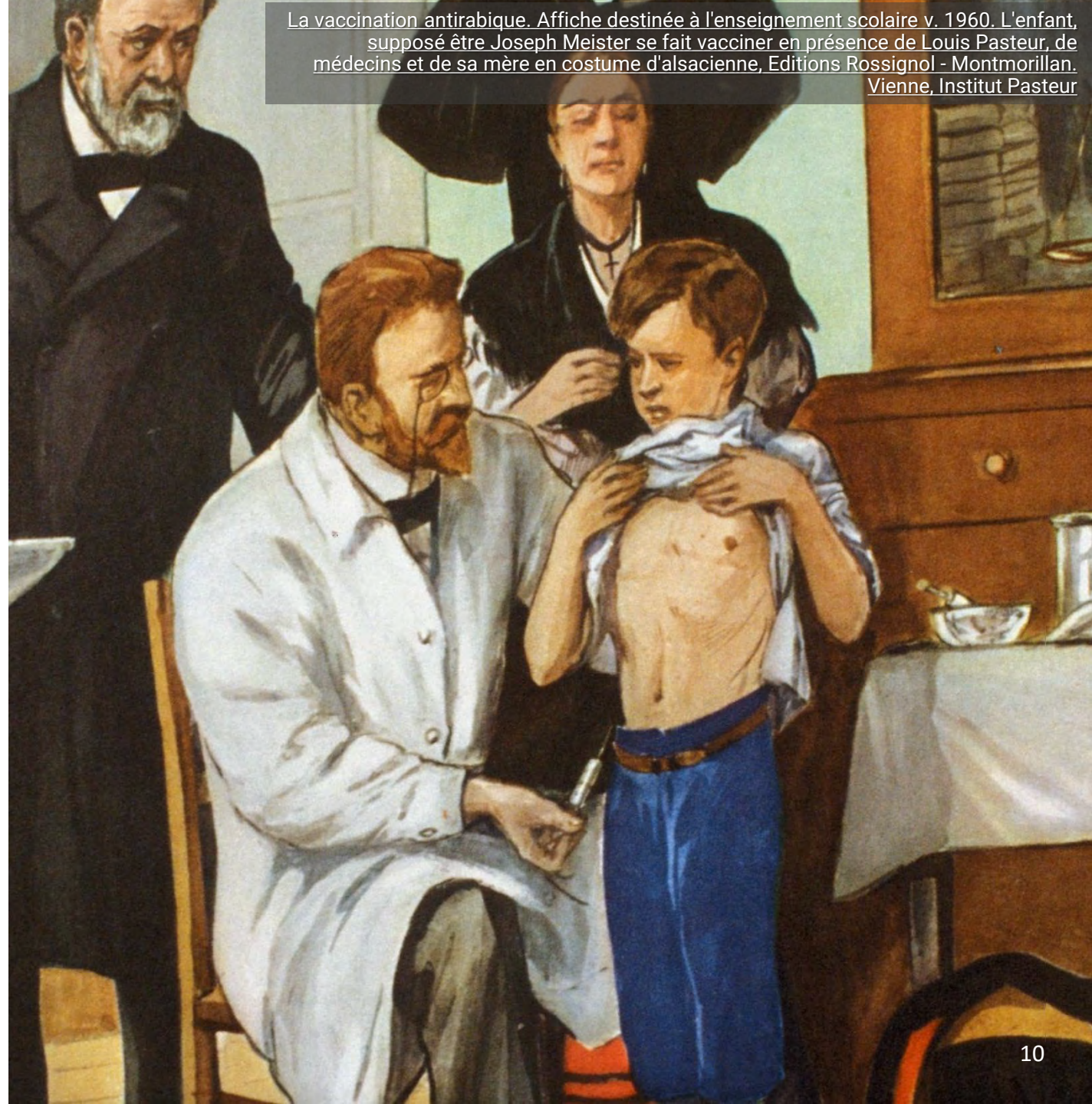
Pasteur conducted his experiments using rabbits, and transmitted the infectious agent from animal to animal until he obtained a stable preparation. Pasteur passed the virus through rabbits and made the virus less dangerous to humans while still giving the body enough information to recognise the antigen and develop immunity to the disease.

On July 6, 1885, Pasteur vaccinated Joseph Meister, a nine-year-old boy bitten by a rabid dog. Meister never developed the disease, becoming the first human to be vaccinated against rabies.



Explore

La vaccination antirabique. Affiche destinée à l'enseignement scolaire v. 1960. L'enfant, supposé être Joseph Meister se fait vacciner en présence de Louis Pasteur, de médecins et de sa mère en costume d'alsacienne, Editions Rossignol - Montmorillan. Vienne, Institut Pasteur





Key Discoveries

Exploring Louis Pasteur's lasting legacy

Louis Pasteur's first laboratory-produced vaccine to protect against rabies soon gave rise to the development of other vaccines. Methods for growing viruses in a laboratory led to many discoveries and innovations, including the creation of vaccines for diphtheria (1888), plague (1897), and tuberculosis (1927). Jenner and Pasteur's pioneering research would also lead to the development of vaccines for other common childhood diseases such as measles (1963), mumps (1967), and rubella (1969).

From smallpox to Covid-19, vaccines have fundamentally changed the way modern medicine is practised and have helped to manage, and in some cases eradicate, some of the world's most deadly diseases – effectively saving countless lives.

Click on the 'Explore' button to learn how immunization has been used to fight germ attacks for centuries.



[Explore](#)

Superbugs and Vaccines

Learn about the incredible world of bacteria and how they infect us

Superbugs are strains of bacteria, parasites, viruses, and fungi that have become resistant to the drugs we commonly use to treat them, making them difficult to treat.

Vaccines can help limit the spread of these superbugs by preventing possible bacterial infections before they take hold in the human body and before the need for any remedial treatment such as antibiotics.

Click on the 'Explore' button to learn more about superbugs and how researchers are working to create new and more effective ways to combat antibiotic resistance.



Watch this video about [Superbugs](#). Make notes as you watch it. Then consider the following questions.



- What are superbugs?
- Do superbugs contribute to epidemics and pandemics? Can you establish the connection.



[Explore](#)





Activity 1

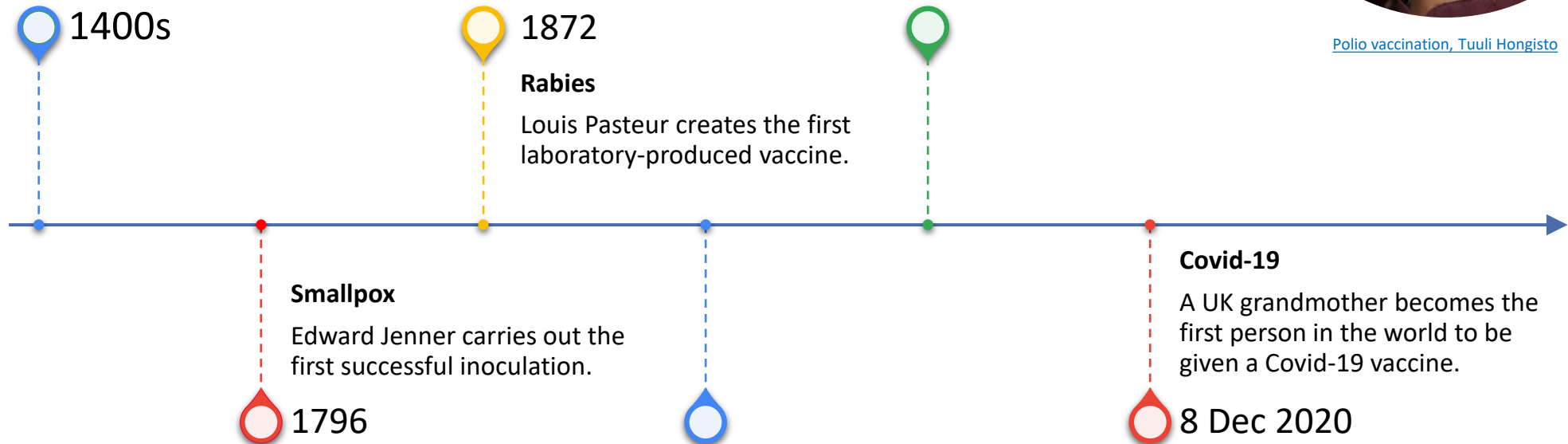
Create a timeline showing the history of vaccines

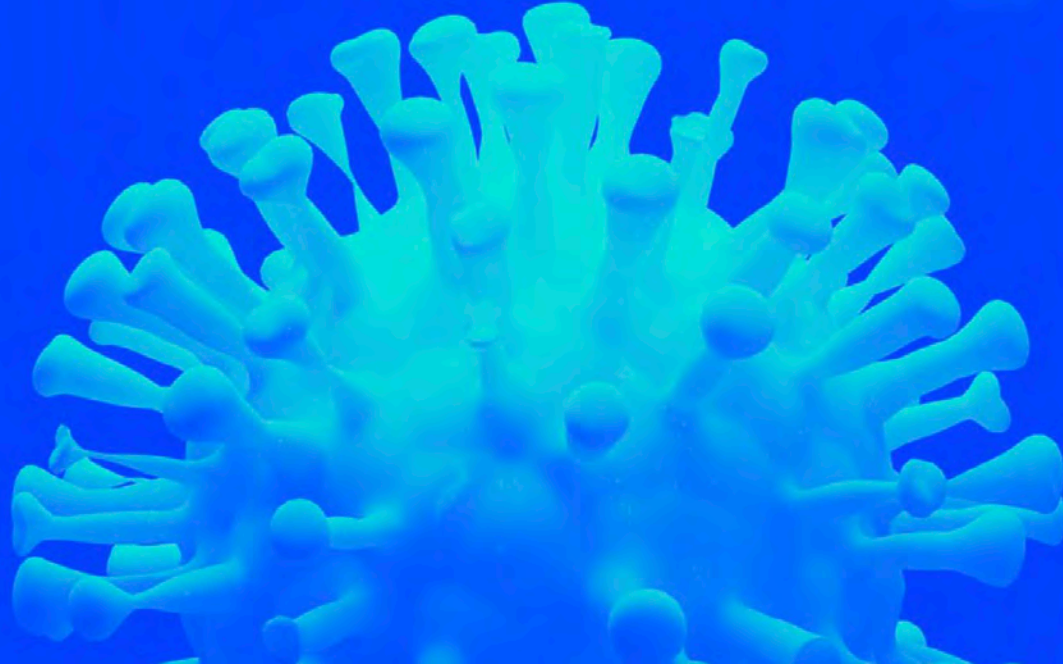


Read [a short story of vaccination](#) and then, using the information you have learnt, design a suitable timeline to illustrate the history and development of vaccines. List the major events including diseases and discoveries.



[Polio vaccination, Tuuli Hongisto](#)





[Graphic of Covid-19 virus, Museum of Engineering Innovation](#)

Covid-19

Learn more about Covid-19, its impact, and how the developed world was vaccinated so quickly



This chapter will take around 40 minutes.



[Curriculum vitae, 2021, MUSE - The Science Museum](#)

An Illustrated Story of Covid-19

Learn about Covid-19 and its impact on the world.



[Many networks and supply chains worked together to bring Covid-19 vaccines to Canada, Ann Fernandes, 2020, Canada Science and Technology Museum](#)

A day in the Life of a Vaccine

Discover the story of the first vial of Covid-19 vaccine — from production of the vaccine to it being injected into the arm of a Canadian healthcare worker.



[Engineer experimenting in the lab, Museum of Engineering Innovation](#)

Mass Manufacturing Vaccines

Meet some of the people who helped develop a way to mass produce a rapid vaccine for Covid-19.



[Spanish health workers, Alejandro García, 2020, Fundación Princesa de Asturias](#)

Health Workers on the Front Line

Learn the stories of Spanish health workers on the front line battling Covid-19.

CURRICULUM VITAE

HISTORY



Coronavirus disease (Covid-19) is an infectious disease caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus. This virus is spread mainly through the air when people have close contact with each other.

It's not completely clear how the coronavirus outbreak started, but it's thought to have originated in China. We know that it spread quickly across the country and from there to many other places in the world.

On 30th January 2020, the coronavirus outbreak was declared a global emergency by the World Health Organisation (WHO). By March of that same year, WHO had declared the coronavirus outbreak a pandemic.

[Explore](#)

Activity 2

Creating An Illustrated Story



Create your own illustrated story of Covid-19 on paper or using a computer.

Things to consider when creating your illustrated story:

- History
- Origin
- Symptoms
- Genetic profile
- Transmission
- Vaccines
- Affected parts of the body



You may need help from your parents or teacher with this activity



COVID-19

SYMPTOMS



COUGH



LOSS OF SMELL



HEADACHE



FEVER

AFFECTED ORGANS



LUNGS



KIDNEYS



HEART



BRAIN



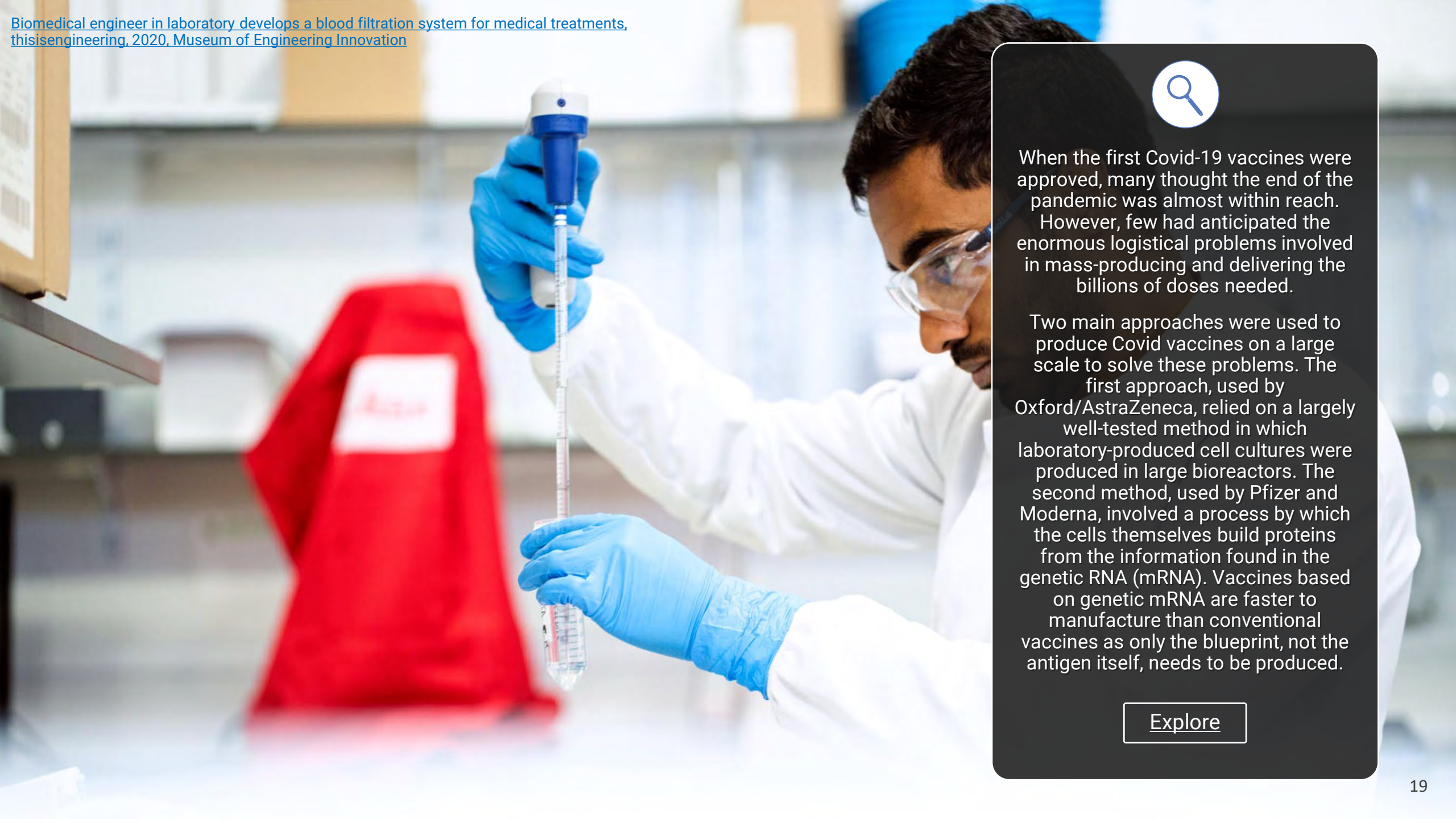


Under normal circumstances, developing a vaccine and bringing it to market can take 10 to 15 years. However, time was not a luxury the world could afford amid a global pandemic. To succeed in developing Covid-19 vaccines in one year instead of 10, new collaborative approaches to science and international manufacturing had to be created.

Thankfully, researchers were not starting from scratch when they learned about SARS-CoV-2, the virus that causes Covid-19. Scientists had been studying other coronaviruses for more than 50 years, which meant existing data on the virus was available. The scientists quickly mobilized to share their coronavirus data with other scientists.

Thanks to this unprecedented level of collaboration and cooperation, researchers came up with vaccines for this new virus much faster.

[Explore](#)



When the first Covid-19 vaccines were approved, many thought the end of the pandemic was almost within reach.

However, few had anticipated the enormous logistical problems involved in mass-producing and delivering the billions of doses needed.

Two main approaches were used to produce Covid vaccines on a large scale to solve these problems. The first approach, used by Oxford/AstraZeneca, relied on a largely well-tested method in which laboratory-produced cell cultures were produced in large bioreactors. The second method, used by Pfizer and Moderna, involved a process by which the cells themselves build proteins from the information found in the genetic RNA (mRNA). Vaccines based on genetic mRNA are faster to manufacture than conventional vaccines as only the blueprint, not the antigen itself, needs to be produced.

[Explore](#)



Among the heroes who emerged from the global Covid-19 pandemic were the health care professionals who risked their health to help others. Their commitment and professionalism throughout the pandemic were evident to us all: extraordinary people performing extraordinary work.

Click on 'Explore' to learn the story of Spanish health workers on the front line against Covid-19.

[Explore](#)



Activity 3

Six words, that is all I need!



The famous author Ernest Hemingway is renowned for being challenged to tell a story in only six words. His response was this:



"For sale: baby shoes: never worn."

Stop and think about these words and consider the story they tell.

Your challenge is to come up with a 6-word story that tells the tale of either Covid-19 or the history of vaccinations.



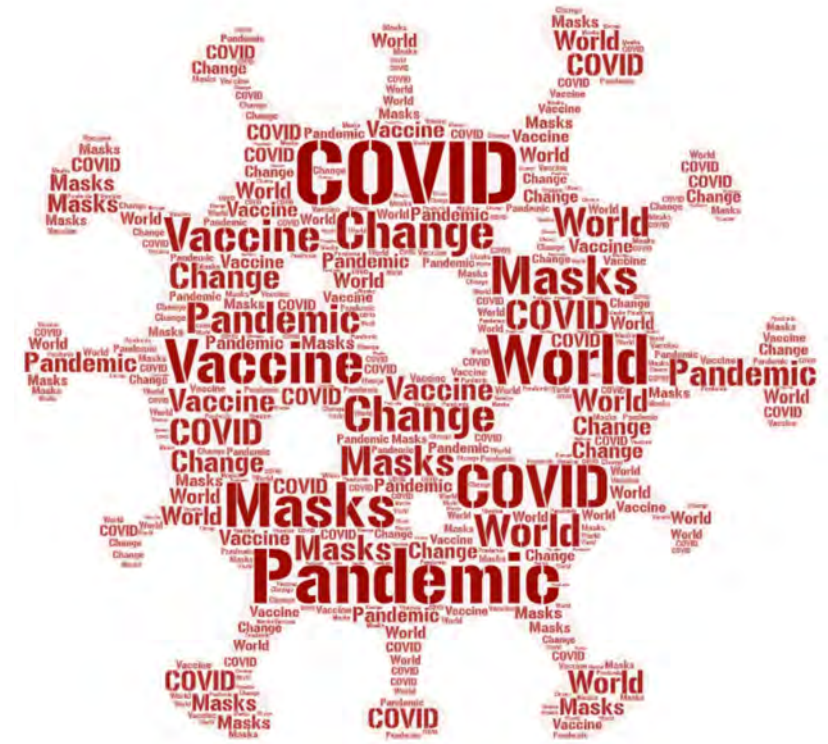
Extra Challenge



Using a free word cloud creator, such as wordart.com, create a poster which includes your six words.



You may need help from your parents or teacher with this activity





[PPE Workers, Darren Butcher, 2020 ,Paintings in Hospitals Paintings](#)

Community and the Arts

An overview of the role of community, innovative medical equipment, and how arts & culture can help during a global pandemic



This chapter will take around 40 minutes.



[HappyShield \(Equipped\), Cooper Hewitt, Smithsonian Design Museum](#)

Masks and other personal protective equipment (PPE)

Explore how engineers, artists, doctors, and designers sought to improve access to PPE during the Covid-19 pandemic.



[Panoptic Hospital, Cooper Hewitt, Smithsonian Design Museum](#)

Hospital Design & Layout

Discover how the hospital has evolved over time in response to ever-changing health care and medical needs.



[Healing breath, Google Arts & Culture](#)

Arts, Health & Wellbeing

Learn how arts & culture can help in a global pandemic.



Masks From Mobile Mask Machine, Cooper Hewitt, Smithsonian Design Museum

Design & Healing: Masks and PPE

Face coverings can reduce the risk of infection because they cover the nose and mouth, reducing the spread of droplets and aerosols carrying potentially harmful viruses. This limits the amount of the virus released into the air when people talk and breathe.

As masks became an essential everyday item during the Covid-19 outbreak, their increased use brought new creative opportunities as people sought face masks that offered comfort and style.

Click on the 'Explore' button to learn how engineers, artists, doctors, and designers responded to a new demand for PPE.



[Explore](#)



Activity 4

Personalised Face Masks



Decorate a face mask with your own personalised design or graphic. When personalising your mask, you should consider:

- Who is the audience?
- What is the purpose of your design?
- What materials will you use to create your design?

When making your design choices, think about whether your mask has a specific function or purpose, such as allowing others to see your mouth so it is easier to lip read. Also consider who are you designing the mask for. You may also want to think about what materials you might use and whether or not these materials are sustainable / safe for the environment?

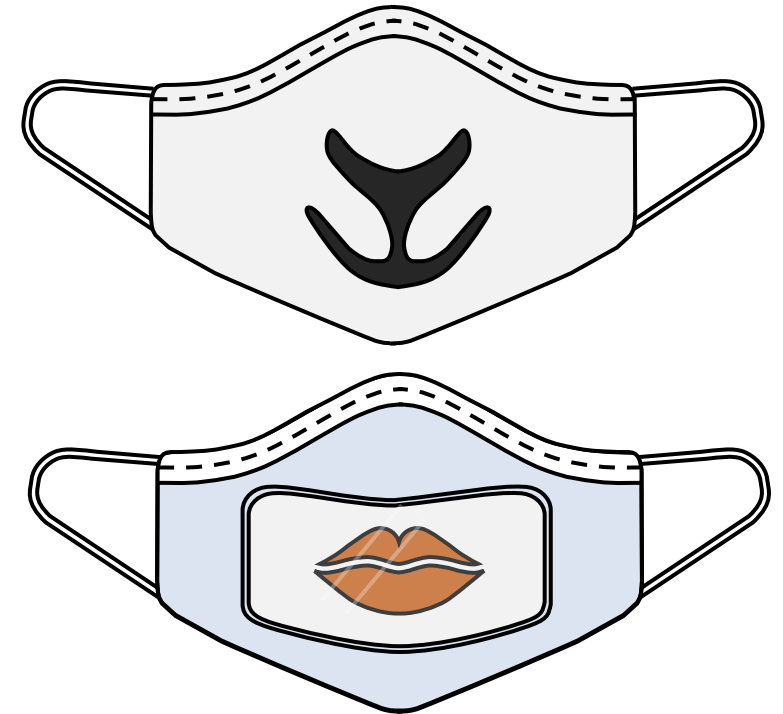


Extra Challenge

Create a mask by upcycling some old materials such as a piece of unwanted clothing!



You may need help from your parents or teacher with this activity



Face Masks, Tablet Academy



20 to 30-minute activity



19 Cooper Hewitt, Smithsonian Design Museum

Hospital Design & Layout

The design and layout of hospitals have changed dramatically over the years. Often these changes have been scientific or government-led. However, architects are now starting to design hospitals that meet more diverse human needs that go beyond the physical, such as supporting patient mental health and wellbeing.

Click on 'Explore' to discover how the hospital has evolved in response to ever-changing health care and medical needs and what the future holds for hospital design.



Arts, Health & Wellbeing

As Covid-19 drove people into enforced isolation and social distancing, creativity flourished in new and surprising ways. Some people found solace from singing or playing a musical instrument, whilst others discovered a newfound love of painting or photography.

During the height of the global Covid-19 pandemic, many people cut off from society found self-comfort through the arts during the long periods of isolation.

Click on 'Explore' to discover the role arts can play in the prevention and promotion of health and wellbeing.



[Explore](#)





Activity 5

Tales from the pandemic



You might want to work with a friend on this activity.



Write a diary entry, poem, song, or short story reflecting on a 'day in the life' during the pandemic.



Start by sketching your ideas into your notebook. You can either draw upon your own experiences of life during the pandemic or reflect on some of the stories covered in this lesson.

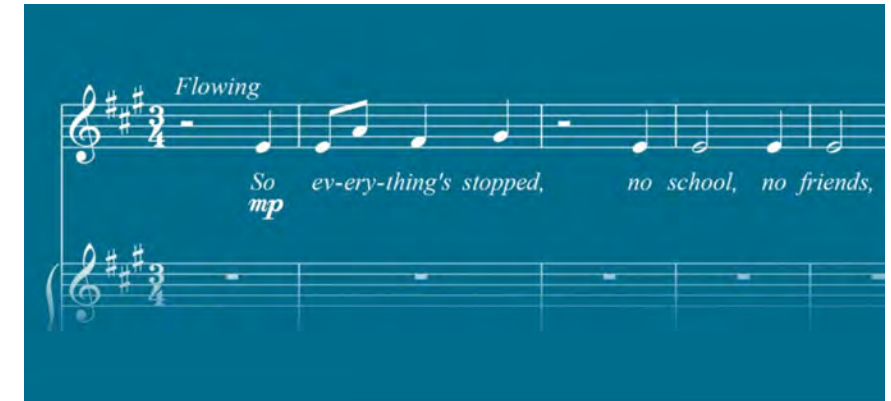


Think about some of the things that stood out during the pandemic such as not being able to see friends and relatives or having to attend school remotely.



Extra Challenge

Record your reflections as a podcast or video.



[Everything Stopped Score, Cambridge Youth Opera, 2020, Arts Council England](#)





Quiz

Fill in the Blanks

See if you can recall what you have learned from this lesson. How many blank words can you fill without going back through the pages.

1. The vials used to store the Covid vaccine are made of
2. was a French chemist and microbiologist who developed a vaccine for
3. is the method used in the 15th century where healthy people were intentionally exposed to smallpox.
4. The are/is an organ that can be affected by the Covid-19 virus.
5. The is an attempt by Professor Harris Makatsoris at King's College London to manufacture vaccines at a massive scale.
6. According to WHO, the role arts and creativity can play in promotion of health and wellbeing can found in these five areas. Name one of these.
7. can be used to support breathing and be helpful for people suffering long-term Covid symptoms.
8. Edward Jenner is famous for delivering the first to inoculate 8-year-old James Phipps against



[arcade game: Computer Quiz Nutting Associates, 1968, The Strong National Museum of Play](#)



[A Brief History of Vaccination: Covax, Carlos Cesar, Booming](#)

Want to Learn More?



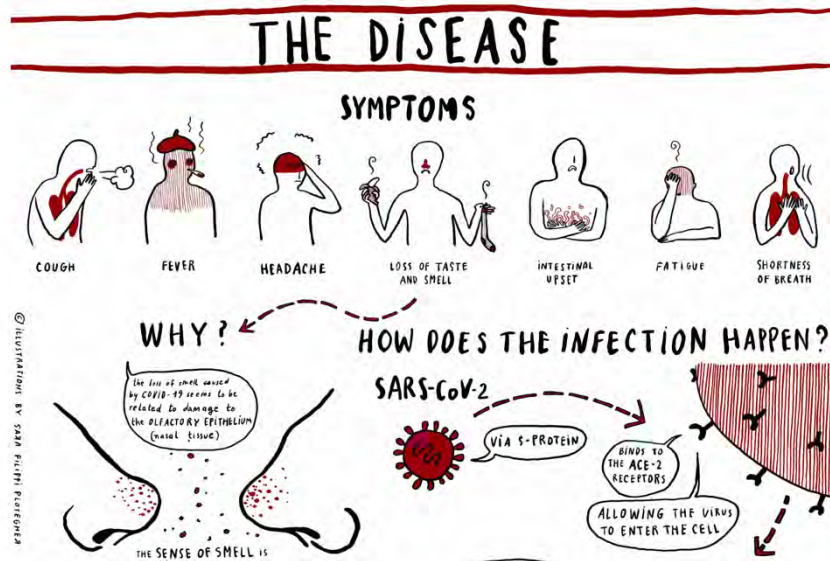
Now you've completed this lesson you may want to continue to find out more about vaccinations, [this](#) is a good place to start. If you want to learn more about arts and health and wellbeing, click [here](#).

Quiz Answers

End of Lesson Quiz

Here are the answers to the quiz. How did you do?

1. Valor Glass
2. Louis Pasteur, rabies
3. Variolation
4. Lungs, kidneys, liver, heart, brain, intestines
5. Factory-in-a-box
6. Music, movement, visualization, storytelling, connect to your environment.
7. Music Therapy
8. Vaccine, smallpox



[The Disease, 2021, MUSE - The Science Museum](#)

Electron micrograph Covid-19, flickr, Fundación Princesa de Asturias

