

## Inquiry Question

**How did the Variola Major virus (Smallpox) impact human history?**

*Exploring and extending our knowledge of viruses  
by exploring how viruses have impacted society in the past.*

Name: \_\_\_\_\_

Date: \_\_\_\_\_



### Lone Dog Winter Count

A Lakota tribal History from 1800 to 1871. Several of the pictographs show the year's most significant event being viral infections such as whooping cough, measles, and smallpox.

Image from Buffalo Bill Center of the West at <https://centerofthewest.org/2020/10/09/museum-minute-lone-dog-winter-count/>, accessed July 8, 2021.

### Did you know...

- smallpox, now eradicated, is estimated to have killed 500 million people between 1900-1978?

## General Instructions

- complete the Unit 3 Learning Guide
- read the background section (below)
- research and present your findings related to the biology of the Variola Major virus and ONE aspect of its role in human history
- complete the assignment and then submit online

## Learning Goals

- to practice communicating scientific ideas and information
- to practice constructing evidence-based arguments
- to explore and reflect on a variety of experiences, perspectives, and worldviews
- to practice constructing evidence-based arguments using appropriate scientific language
- to explore and expand on our knowledge of the "biology" of viruses in general and smallpox specifically
- to explore how viruses can have different impacts on different people and significantly shape history

# How did the Variola Major virus impact human history?

## Background

The Variola Major virus, more commonly known as smallpox, is thought to have killed more people in history than all other diseases combined. There are records and physical evidence of smallpox outbreaks dating from 2000 to 3000 years ago. In the 20<sup>th</sup> century alone, smallpox is estimated to have killed over 500 million people. Furthermore, colonizing Europeans inadvertently, **and intentionally**, decimated the Indigenous Peoples of North America with the smallpox virus. Smallpox also led to the development of vaccinations. In fact, the very term vaccination is derived from the smallpox vaccine itself. Fortunately, the smallpox virus was declared eradicated by the World Health Organization (WHO) in 1980. However, the smallpox virus still looms as a threat over humanity as we no longer immunize for it. If the smallpox virus were to be accidentally released from a lab, or if it were intentionally released as biological weapon, our current population would be vulnerable. Thus, smallpox remains an area of scientific research and political policy debate, even today. This inquiry gives you an opportunity to explore a bit about the biology of the Variola Major virus and an opportunity to explore ONE of several ways that it has impacted human history.

## Detailed Instructions

- please research the BIOLOGY and **one** HISTORICAL aspect (listed below) of the Variola Major virus and present the information in one of the following formats:
  - poster
  - PowerPoint or similar software-based presentation
  - newspaper
  - formal written report
  - timeline

- please ensure your "biological" research and presentation covers the following:
  - structure of Variola Major
    - type and size of genome
    - size of virion particle
    - key proteins
    - how its genome is packaged
  - prevalence of Variola Major
    - when major infections/outbreaks were first and last reported
    - when and where major outbreaks were recorded
    - who and how many people were affected
    - its mortality rate
  - how Variola Major causes disease
    - how it is transmitted (spread)
    - how it infects the body
    - description of symptoms and progression of disease
  - how Variola Major infections are prevented and treated
    - measures to prevent infection and spread
    - measures to treat those infected
  
- please ensure your research and presentation explores one of the following HISTORICAL impacts of the Variola Major virus:
  - effect on the Aztec Empire
  - use as a biological weapon against Indigenous Peoples of North America
  - development of treatments such as inoculations and vaccinations
  - potential to be used as a biological weapon today

## Some Helpful Resources

- Smallpox from Medline Plus, last reviewed September 15, 2016, at:
  - <https://medlineplus.gov/smallpox.html>
- Smallpox (Variola Virus) – Topoisomerase 1B, by Wade Cook, Michal Harel, and Alexander Berchansky, published by Proteopedia, December 18, 2019 at:
  - [https://proteopedia.org/wiki/index.php/Smallpox\\_%28Variola\\_Virus%29\\_-\\_Topoisomerase\\_1B](https://proteopedia.org/wiki/index.php/Smallpox_%28Variola_Virus%29_-_Topoisomerase_1B)
- The Rise and Fall of Smallpox, by Jesse Greenspan, published by History, May 7, 2020, at:
  - <https://www.history.com/news/the-rise-and-fall-of-smallpox>
- How smallpox devastated the Aztecs – and helped Spain conquer an American civilization 500 years ago, by Richard Gunderman, in The Conversation, republished by PBS News Hour, February 23, 2019, at:
  - <https://www.pbs.org/newshour/science/how-smallpox-devastated-the-aztecs-and-helped-spain-conquer-an-american-civilization-500-years-ago>
- Smallpox Blankets, from Native Teaching Aids, posted August 14, 2020, at:
  - <https://www.nativeteachingaids.com/cfd-blog/2020/7/24/smallpox-blankets>
- Disease Has Never Been Just Disease for Native Americans by Jeffery Ostler, published by The Atlantic, posted April 29, 2020, at:
  - <https://www.theatlantic.com/ideas/archive/2020/04/disease-has-never-been-just-disease-native-americans/610852/>
- History of Smallpox, published by the Centre for Disease Control, last reviewed February 20, 2021, at:
  - <https://www.cdc.gov/smallpox/history/history.html>
    - Information covering both the biology and history of Smallpox, the development of the smallpox vaccine, and its potential use as a biological weapon.
- Smallpox: a disease and a weapon, by Ken Alibek, published by the International Journal of Infectious Diseases, October 1, 2004, at:
  - [https://www.ijidonline.com/article/S1201-9712\(04\)00130-4/fulltext](https://www.ijidonline.com/article/S1201-9712(04)00130-4/fulltext)