

# Elementary

**LESSON 3**  
Hilleman & Vaccines

# Lesson 3

**Who Was Maurice Hilleman?**  
Hilleman & Vaccines



## LESSON INSTRUCTIONS

### Lesson 3: Who Was Maurice Hilleman?

## ESSENTIAL QUESTION

What are the human stories behind vaccines?

## OVERVIEW & PURPOSE

Most students will have received vaccinations and will understand that these protect from disease. However, students may not know any history related to vaccine development. In this lesson, students will learn about one particular vaccine “hero” to learn how individual people or teams have created life-saving vaccines. Students will learn that Maurice Hilleman came from a very similar background as theirs (rural Montana) and he went on to make a tremendous impact on our world.

## MONTANA EDUCATION STANDARDS

CCSS.ELA.RI.3.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-LITERACY.RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.

CCSS.ELA-LITERACY.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

CCSS.ELA-LITERACY.RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

CCSS.ELA-LITERACY.RL.3.3 Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events





## LESSON INSTRUCTIONS

### Lesson 3: Who Was Maurice Hilleman?

## OBJECTIVES

*Students will*

1. Compare the histories of different people who have developed vaccines.
2. Synthesize the biography of Maurice Hilleman.
3. Summarize the information in a flip book.

## MATERIALS



Edward Jenner graphic biography ([pages 101-102](#))



Hilleman biography foldable book (one for every student or pairs of students) ([pages 104-107](#))



Who Was Maurice Hilleman student flip book ([pages 110-112](#))

## VERIFICATION

*Ask these questions at the end of the lesson to check for student understanding:*

1. Who were some scientists famous for their work in vaccinology?
2. Who was Maurice Hilleman?
3. What were some character traits that helped motivate Hilleman?



## ACTIVITY INSTRUCTIONS

### Lesson 3: Who Was Maurice Hilleman?

## ENGAGEMENT

*Use the following discussion template to introduce the lesson:*

Have students begin by naming any scientists they can think of (George Washington Carver, Thomas Edison, Marie Curie, etc.) Explain how there is a special group of scientists who have worked for hundreds of years to fight against diseases. Show students the Vaccine Makers Project graphic story of Edward Jenner who first invented the vaccine for smallpox (page x-x). Then introduce students to a few of the scientists who are famous in the field of vaccines using the Vax Pac Hero website <http://vaxpackhero.com/vaccine-heroes/>.

Explain that one of the most important inventors of vaccines came from Miles City, Montana to introduce Marice Hilleman.

## EXPLORATION

Watch the trailer to the documentary HILLEMEN: A Perilous Quest to Save the World's Children (depending on the age of the students, you can watch the whole documentary, or sections that are available on YouTube or at <https://vaccinemakers.org/resources/videos-animations>). You will have to click on the link to access the trailer through YouTube (2:38). <https://youtu.be/1YjgKA4kl0U>.

Have students work individually, in pairs, or as a class to read the foldable book “Who is Maurice Hilleman”. *Note: When printing, change settings to print double sided with it flipping on the short side. The book can then be folded and stapled on the crease.*

*Older students can read the Maurice Hilleman Biography*

## EXPLANATION

Refer to the Maurice Hilleman and vaccine pages in the background information section of this curriculum (pages 8-19).

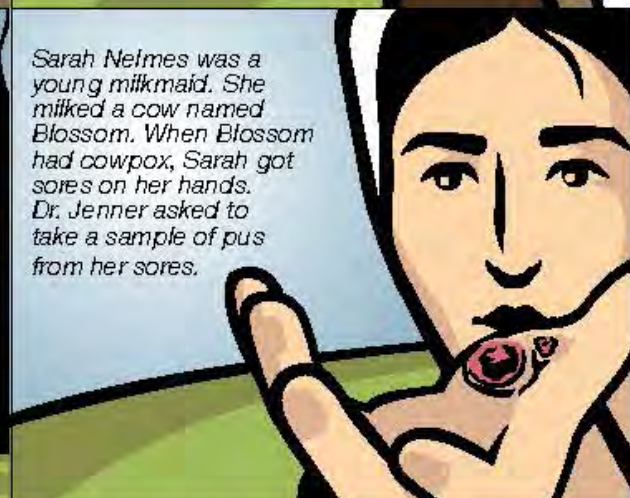
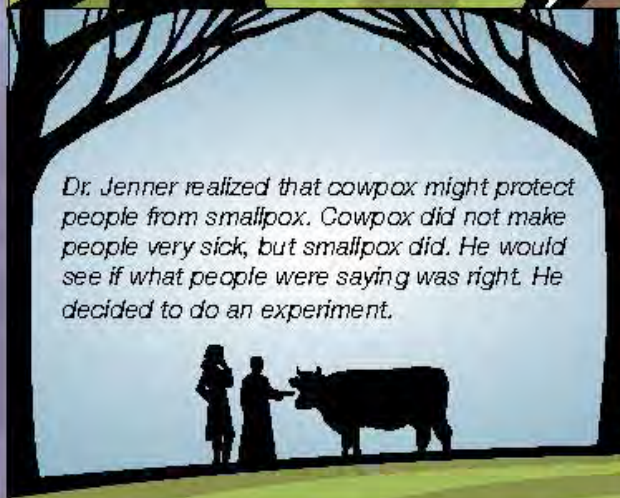
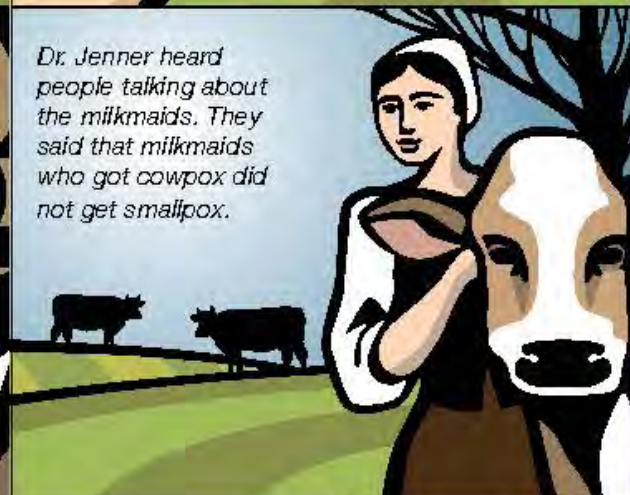
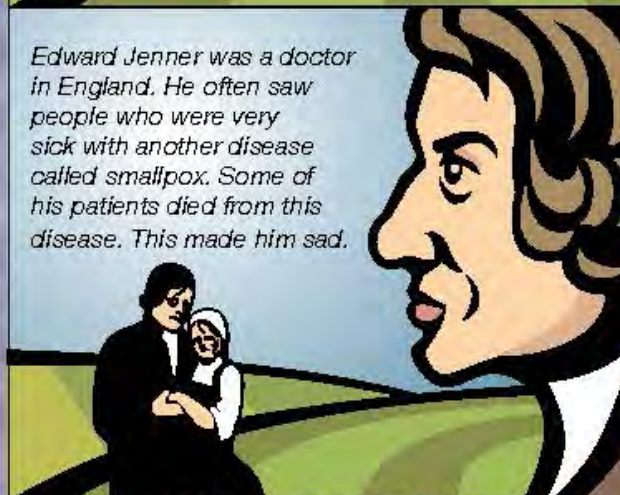


# Edward Jenner

Getting help from a cow, a milkmaid and a boy



VaccineMakers.org



Material adapted from the VaxPack Hero project produced by the Vaccine Education Center at Children's Hospital of Philadelphia. For more resources, including an online game, visit [VaxPackHero.org](http://VaxPackHero.org).

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# Edward Jenner

*Getting help from a cow, a milkmaid and a boy*



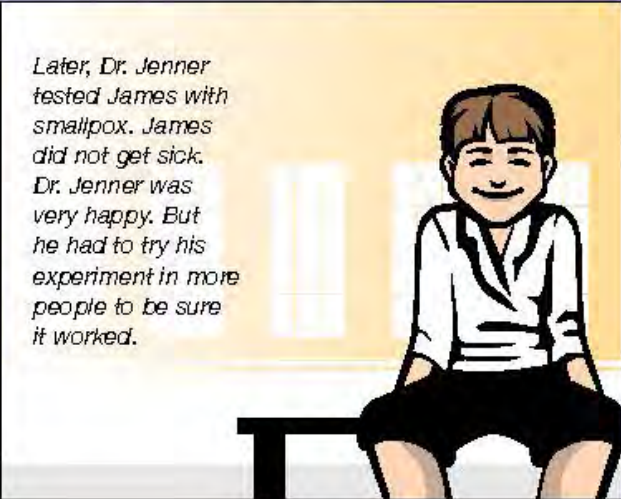
the  
vaccine makers  
project

VaccineMakers.org

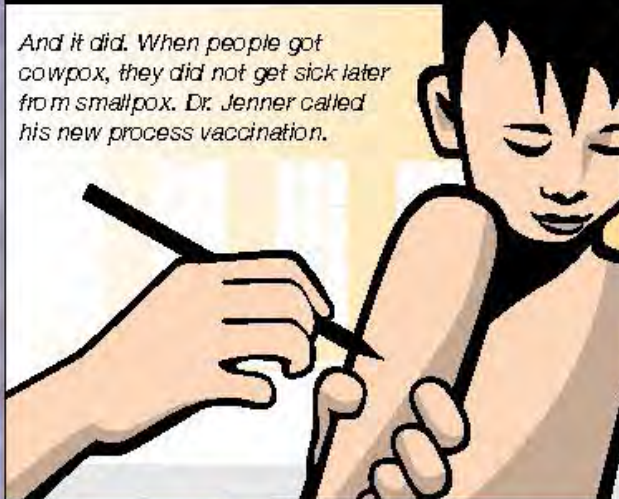
*Dr. Jenner then tested his idea on a young boy. James Phipps was only 8 years old. Dr. Jenner put some of the pus from Sarah's sores just under James' skin.*



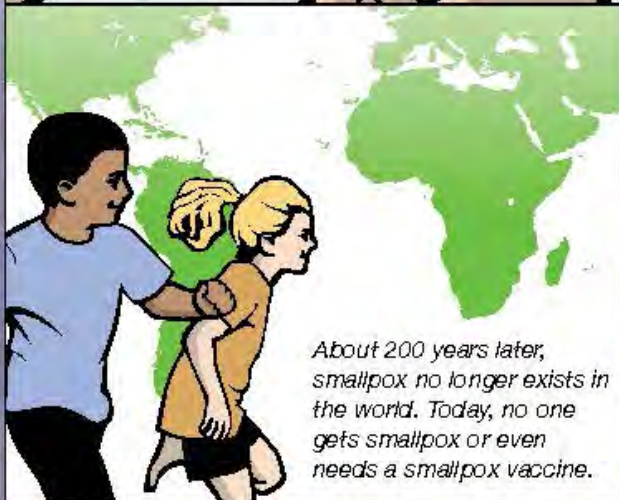
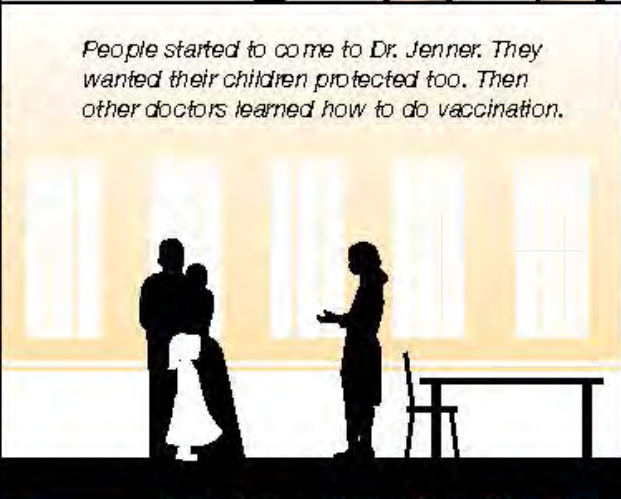
*Later, Dr. Jenner tested James with smallpox. James did not get sick. Dr. Jenner was very happy. But he had to try his experiment in more people to be sure it worked.*



*And it did. When people got cowpox, they did not get sick later from smallpox. Dr. Jenner called his new process vaccination.*



*People started to come to Dr. Jenner. They wanted their children protected too. Then other doctors learned how to do vaccination.*



*About 200 years later, smallpox no longer exists in the world. Today, no one gets smallpox or even needs a smallpox vaccine.*

*Blossom, Sarah Nemes, James Phipps and Dr. Jenner are heroes. Their work helped all of us.*



Material adapted from the VaxPack Hero project produced by the Vaccine Education Center at Children's Hospital of Philadelphia. For more resources, including an online game, visit [VaxPackHero.org](http://VaxPackHero.org).

PAGE 2 OF 2

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## Later in Life

Hilleman was modest, but he believed in hard work. None of his vaccines were named after him. He insisted on watching over all the steps of developing a vaccine. It was very important to him that his vaccines were safe.

Hilleman retired in 1984. He continued to help with national and international public health organizations, including the World Health Organization. He thought vaccines for malaria, tuberculosis, and AIDS were necessary. Hilleman died at the age of 85, on April 11, 2005.



## Who Was Maurice Hilleman?



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# Family Life

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In 1943, Dr. Hilleman married his hometown sweetheart, Thelma Mason. In 1957, shortly after adopting his daughter, Jeryl Lynn, he began working for Merck. Sadly, his wife, Thelma, died in 1963.

In 1963, Jeryl Lynn came down with the mumps. By weakening the mumps virus he had obtained from swabs of her throat, he was able to make a safe and effective mumps vaccine. The same strain of mumps virus is used to make the mumps vaccine today. It is called the Jeryl Lynn strain.

Dr. Hilleman married Lorraine Witmer the following year. They had a daughter, Kirsten, in 1965.



# Schooling

After graduating from Custer County High School in Miles City, Maurice worked in a JC Penney store. He almost didn't get to go to college, but his eldest brother helped to persuade their biological father, that Maurice should have the opportunity to attend college. Maurice also won scholarships.

In 1941, Hilleman graduated first in his class from Montana State University. Next he went to the University of Chicago. In 1944, he received his doctorate in Microbiology and completed award winning research.



2.

# Career

In 1944, Hilleman went to work for E.R. Squibb and Sons and developed a vaccine for Japanese encephalitis. This was a disease that was killing American soldiers in the Pacific during World War II.

Hilleman became chief of respiratory diseases at Walter Reed Hospital in 1949. By studying the influenza virus, he was able to recognize that a 1957 outbreak of influenza in Hong Kong could become a worldwide epidemic, also known as a pandemic. Hilleman coordinated the creation of 40 million doses of vaccine. Although 69,000 Americans died, without Hilleman's rapid response, the pandemic would have been much worse. Hilleman received the Distinguished Service Medal from the American military for his work.

In 1957, Dr. Hilleman began working for Merck to oversee vaccine research and development. He remained at Merck for the rest of his career and developed almost forty vaccines.

3.



## MMR and Other Vaccines

Hilleman developed the MMR (measles, mumps, and rubella) vaccine in 1971. By putting three vaccines into one injection, kids would only have to get one shot instead of three! In most of the world, his vaccines have almost wiped out many of these once-common childhood illnesses.

In 1981, Hilleman created a vaccine for hepatitis B, a terrible virus found in the blood. Hepatitis B can cause cancer of the liver cells, so his vaccine was said to be the first to prevent human cancer.

Besides making vaccines to stop human diseases, Hilleman also made vaccines for the poultry industry, saving millions of chickens and millions of dollars. In addition, Hilleman is given credit for co-discovering different viruses, including the hepatitis A virus and the rhinoviruses that cause colds.

## Early Life

Did you know that Maurice Hilleman's work saves about 8 million lives a year? That's about the number of people who would live in EIGHT Montanas! Who is Maurice Hilleman?



Maurice Ralph Hilleman was a microbiologist from Montana whose hard work and perseverance in the field of immunology helped him to develop about 40 vaccines over 60 years. He is most famous for inventing eight of the fourteen vaccines most children receive today.

Maurice was born on August 30, 1919, in Miles City, Montana. Maurice was the eighth child born to Robert and Edith Hilleman. His mother and his twin sister died soon after he was born. Maurice went to live with his aunt and uncle on a nearby farm. The farm served as his first science laboratory, teaching him the basics about chicken eggs which he used later as a scientist to grow viruses.

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## ACTIVITY INSTRUCTIONS

### Lesson 3: Who Was Maurice Hilleman?

## EVALUATION

*Steps to check for student understanding:*

Students can work together to fill out the “Who is Maurice Hilleman” flip book.

It might be helpful to wait to complete the sections on challenges, accomplishments, personal characteristics and lessons learned after watching the video “Hilleman: The Man behind the Science”. You will need to click on the link here: <https://vaccinemakers.org/resources/videos-animations> or access the video on YouTube (16:15) <https://youtu.be/pLP51xC5mQw>

**Make sure to select "Fit"  
in the printer settings.  
Cut out this entire  
rectangle.**

**When cutting the flip book  
pages apart, make sure you  
leave the heading at the bottom  
of each page. Only the cover does  
not have a heading. There are  
7 pages total (including the cover).**

**For example, you need to keep  
this space along with the rectangle above.**

**The last two pages can be cut in half along the  
vertical line in the middle. Then arrange the  
flaps by size, with the smallest on top and  
staple them along the top edge.**



# Who Was Maurice Hilleman?



By: \_\_\_\_\_

Maurice Hilleman was \_\_\_\_\_ years old when he died.  
Date born: \_\_\_\_\_ Date died: \_\_\_\_\_

Childhood:

Where and how did he grow up?



Where is he from? Color the state and country.

## Early Life

Important People in His Life

Education:

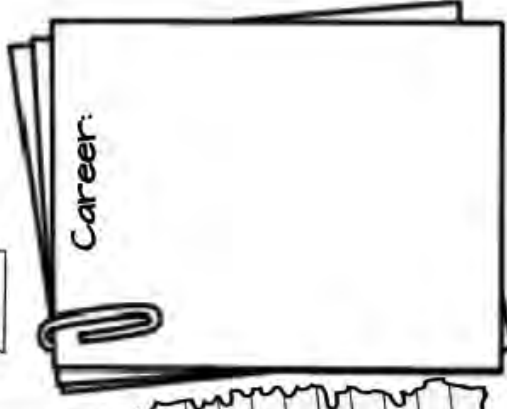
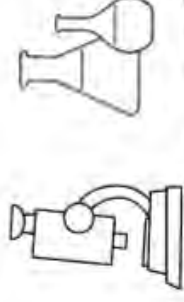
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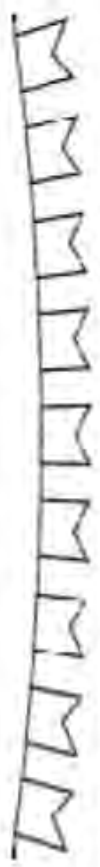
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3

Career:

## Education and Career





5 Personal Characteristics

1.

2.

3.

4.

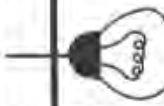
5.

Accomplishments

# Accomplishments

What challenges did he face?

How did he overcome his challenges?

What lessons can we learn from him?

# Challenges

## Things You May Not Know

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Resources to Learn More

Quotes



## Interesting Facts

## Timeline of Events

