Elementary

LESSON 4

Hilleman & Vaccines

Lesson 4

What Were Hilleman's Contributions to Science?

Hilleman & Vaccines

LESSON INSTRUCTIONS

Lesson 4: What Were Hilleman's Contributions to Science?

ESSENTIAL QUESTION

Can one person make a big difference?

OVERVIEW & PURPOSE

Students relate the concept of how one person can make a big difference to a real-life scientist. By viewing a scientific discovery through the human story, students not only learn the facts of vaccines, but also come to understand that such facts are revealed by a scientific process. This is the same process that underlies all scientific discoveries.

MONTANA EDUCATION STANDARDS

CCSS.ELA.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.3.W.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

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

NGSSK-2-ETS-1. Students can define the problem, note his observations, and explain his solutions.

NGSSK-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

NGSS2-PS1-1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.

LESSON INSTRUCTIONS

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OBJECTIVES

Students will

1. Learn about the steps of the scientific method.
2. Explore how the scientific method was used in the development of vaccines.
3. Recall information from a variety of sources.

MATERIALS

- Jeryl Lynn & the Mumps Vaccine Story (pages 120-121)
- Scientific Method reading comprehension student worksheet (page 122)
- Vaccine Card Game Materials (pages 123-125)
- Internet accessible devices (you can have one per student or they can share and work together as teams)

VERIFICATION

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

1. How do scientists use the scientific method?

2. How was the scientific method used in developing vaccines?

3. What are some special facts about Maurice Hilleman?

ACTIVITY INSTRUCTIONS

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ENGAGEMENT

Use the following discussion template to introduce the lesson through a class discussion:
Does anyone remember what inspired Dr. Hilleman to create a vaccine to fight against the mumps? (His daughter Jeryl Lynn came down with mumps and he used her swabs to create a mumps vaccine.)

Can anyone name any other diseases for which children are routinely vaccinated? (responses might include measles, polio and whooping cough) Which of these diseases commonly occurs in the United States? Students should recognize that today, none of these diseases are common in the U.S. because of vaccination.

EXPLORATION

Dr. Hilleman, like most scientists, used the scientific method. Have students read the illustrated story and answer the questions on the Scientific Method worksheet (pages 120-122).

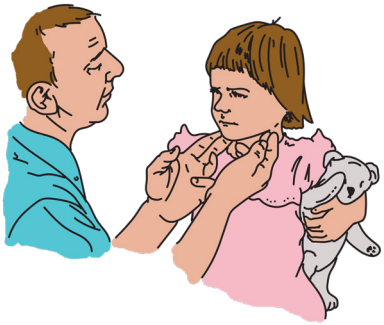
List of specific, current vaccinations for Ages 0 mo. - Kindergarten for child born 04/01/2016 (Monument Health, Spearfish, South Dakota)

Numerous immunizations are recommended for children starting at birth. This immunization report from a child born on April 26, 2016 in Spearfish, South Dakota shows a fully vaccinated child according to recommendations in 2021. For a list of Montana's requirements, please visit https://dphhs.mt.gov/publichealth/immunization/childcareandschoolresources

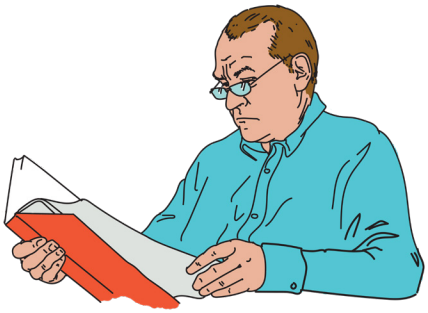
This is a list of immunizations that your clinic has on file for you.

DTaP Dates on file: 07/06/2017 Learn more	**DTaP / Hep B / IPV** Dates on file: 10/03/2016, 07/25/2016, 05/18/2016 Learn more	**DTaP / IPV** Dates on file: 06/08/2020 Learn more
Ez Flu 16-17(fluzon Qd Ped)(pf) 30 Mcg(7.5 Mcg X4)/0.25 Mt Dates on file: 01/13/2017, 10/03/2016 Learn more	**Flu vaccine (PF) greater than or equal to 6 months IM** Dates on file: 12/21/2018 Learn more	**Fluarix/Flulaval/Fluzone Quad** Dates on file: 10/09/2017 Learn more
Hep A, 2 Dose Dates on file: 10/09/2017, 04/07/2017 Learn more	**Hep B, Unspecified** Dates on file: 04/01/2016 Learn more	**Hib (PRP-T)** Dates on file: 07/06/2017, 10/03/2016, 07/25/2016, 05/18/2016 Learn more
Influenza, Unspecified Dates on file: 12/27/2019 Learn more	**MMR** Dates on file: 06/08/2020, 04/07/2017 Learn more	**Pneumococcal Conjugate 13-Valent** Dates on file: 07/06/2017, 10/03/2016, 07/25/2016, 05/18/2016 Learn more
Rotavirus Pentavalent Dates on file: 10/03/2016, 07/25/2016, 05/18/2016 Learn more	**Varicella** Dates on file: 06/08/2020, 04/07/2017 Learn more	

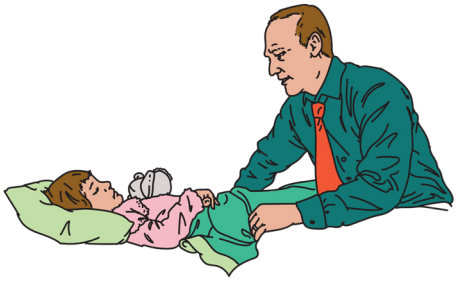
JERYL LYNN HILLEMAN & THE MUMPS VACCINE



At 1:00 a.m. on March 23, 1963, five-year-old Jeryl Lynn Hilleman woke her father complaining of a sore throat. He reached out and felt the side of her face, where he found a lump, causing Jeryl to wince.



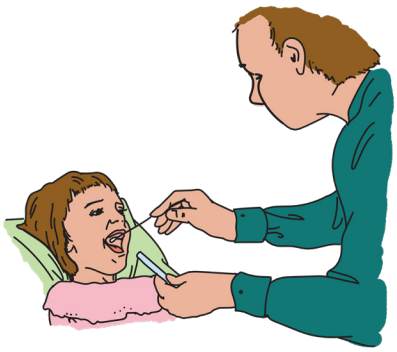
Concerned, Hilleman consulted his Merck Manual, a book of medical information. He found that Jeryl's symptoms meant she had the mumps!



Hilleman then tucked his daughter back in bed and went to work.

At his laboratory at Merck, he gathered supplies.

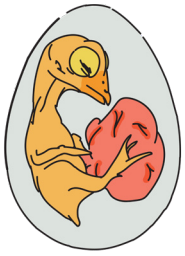
Back home, he woke Jeryl up and took a sample by swabbing the back of her throat. He returned to Merck, stored the sample, and went home.



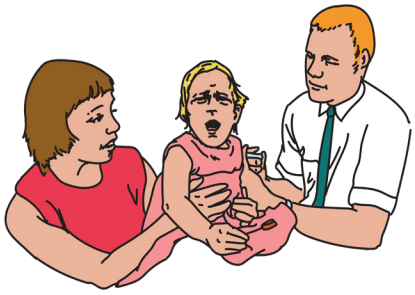
Illustrations by Jenn Hall *Words by Sabre Moore*

LESSON RESOURCES

Lesson 4: What Were Hilleman's Contributions to Science?

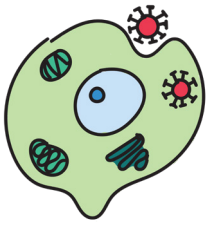


Back at his laboratory, Hilleman took the sample of Jeryl's virus and injected it into a hen's egg. The virus grew in the membrane surrounding the unborn chick. Hilleman then removed the virus and injected it into another egg. He repeated this procedure five times.



Once a vaccine was made, scientists put together a trial to test it. One of the first children to get Hilleman's experimental vaccine was his second daughter, Kirsten.

On March 30, 1967, four years after Jeryl got the mumps, the vaccine was licensed.



This process would weaken the virus so that a vaccine made from it would stimulate immunity in children but not cause the disease.

Four hundred children in Philadelphia were recruited for the trial. Two hundred received the vaccine, and two hundred did not. Months later, mumps came through town. Only two of the children who received the vaccine got the disease, proving the vaccine worked well.

Illustrations by Jenn Hall *Words by Sabre Moore*

Name: _____ **Date:** _____

The Scientific Method

Read the story about Jeryl Lynn and the Mumps Vaccine, then answer the following questions:

Question:

Hypothesis:

Materials

1.

2.

3.

Procedure

1.

2.

3.

Observations:

Conclusions:

ACTIVITY INSTRUCTIONS

Lesson 4: What Were Hilleman's Contributions to Science?

ACTIVITY

Vaccines, including the ones Dr. Hillman developed, help contain the spread of diseases. This activity will show students that having a vaccine helps keep them safe and diseases cannot spread between immunized people. Those who are vaccinated provide a barrier that stops the infection from spreading to others.

MATERIALS

- One card for each student (either vaccine, virus, or blank)

INSTRUCTIONS

1. Print out cards and fold each card in half.

2. Distribute one to each child. Tell the kids not to look at their cards.

3. Have the students open their cards and raise them in the air. Encourage them to look around at what their neighbors have.

4. Tell the kids that those who have vaccines are safe. Those who have blank cards are vulnerable. Those with the virus can pass it to those with blank cards if they are a neighbor.

5. Discuss.

FURTHER RESOURCES

Watch the review of Hilleman's legacy in 100 years of Hilleman. There is a free printable activity book (includes information on Maurice Hilleman) that will review all of the information learned in lessons 1-4 https://media.chop.edu/data/files/pdfs/vaccine-activity-book.pdf

There are three interactive online Kahoot games about Dr. Hilleman. These are fun, engaging, and competitive! You will have to create a free kahoot account in advance. Only the teacher needs an account. Students can play individually or as teams. There needs to be one Internet accessible device per team.

ACTIVITY RESOURCES

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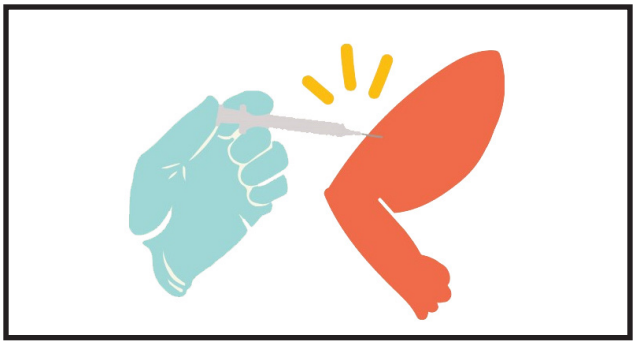

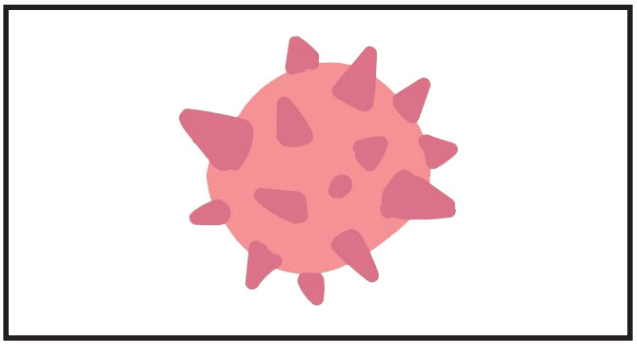

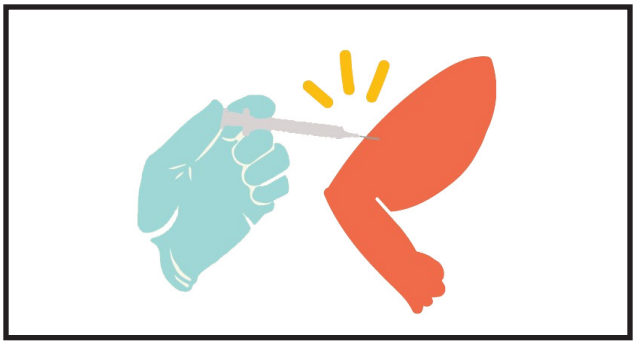

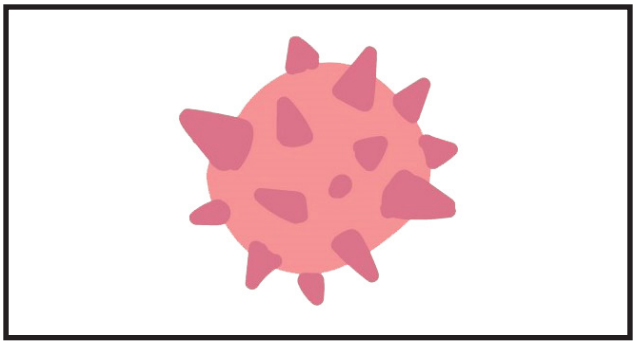

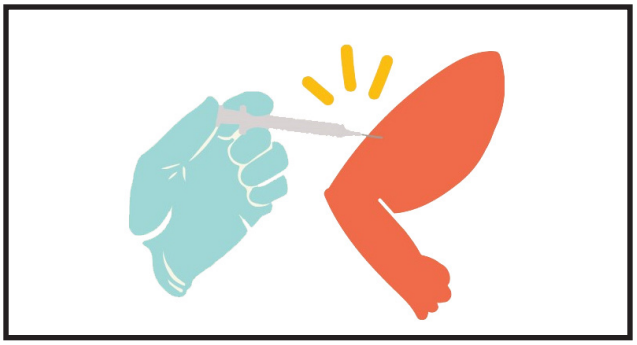

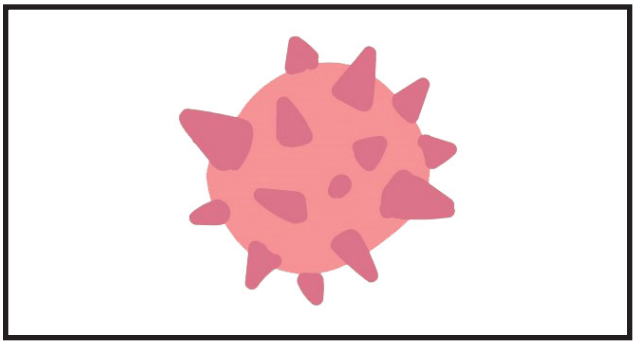

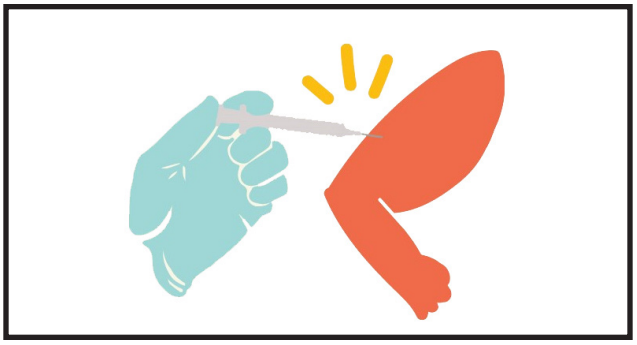

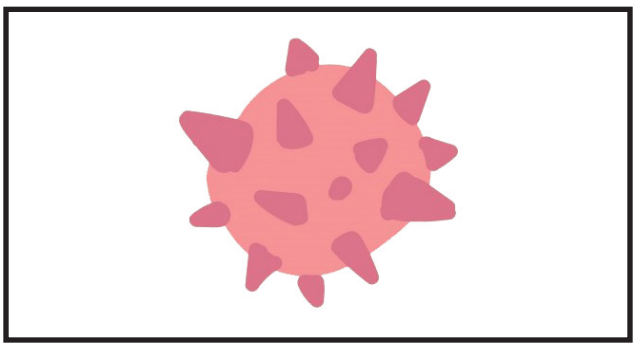

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