Understanding Vaccines and the Immune System Is This Really "New" Science? A Unit for Middle School Students

# Table of Contents

Abstract: Masbeilillagilly xaiadihdihaadi xaibyaililijuliyadin P

I.

## Google Slides History of Vaccinations Interactive Timeline Activity

### **Lesson Questions**

Are vaccines really "new" science? What societies and people have been involved in the development of vaccines? How has society benefited from the development of vaccines for diseases such as smallpox?

#### Lesson Objectives

Students will work in groups to research the history of vaccinations and then as a class combine their research to create a timeline on the history of vaccinations using Google Slides. Students will understand that vaccination development is not a recent development but has been happening throughout different cultures and societies for hundreds of years. Students will research and analyze p

#### NGSS Standards

\_

#### Science is a Way of Knowing:

Science knowledge has a history that includes the refinement of, and changes to, theories, ideas, and beliefs over time.

#### Scientific Investigations Use a Variety of Methods:

Science investigations use diverse methods and do not always use the same set of procedures to obtain data.

New technologies advance scientific knowledge.

Scientific investigations use a variety of methods, tools, and techniques to revise and produce new knowledge.

#### Science is a Human Endeavor:

vaces i (e)9gc)-59 (i)5.1 n(e)9e)9r)4.6 (i)5.1 (gc)-59.

ate-82 (r)--15 i2r1 89 (s) JU Tc 0 Tw-3716 0 Td() TjEMC Py K/ICIEB6 BD--3716 -1229TTd() TjEMC K/Body K/ICIED96 BD (20 1 Tf-8076 -1229TTd)

		<u>John Adams</u> Colonial Army	
7	The 1700s	<u>Edward Jenner</u> - Biography Research Where did the word "vaccine" come from?	
8	The 1800s	Inoculations/Vaccinations throughout the world Public Response What was happening with disease outbreaks? Louis Pasteur	
9	The 1900s	Maurice Hilleman Two other influential scientists and their research	
10	The 1900s	Jonas Salk Two other influential scientists and their research	
11 & 12	Late 1970 - Present	Smallpox Where is it now? Which diseases now have vaccines Polio Measles - What is it? Outbreaks - Why? Whooping cough - What is it? Why do we have outbreaks? Disease statistics since the introduction of vaccines	

## Understanding Vaccines and the Immune System Is This Really "New" Science? A Unit for Middle School Students Daily Lesson Plans – 5E Instructional Model

Day	Component	Description	Activity/Homework
1	Engage	<ul> <li>In Science Notebooks answer: <ol> <li>What are vaccines?</li> <li>Are vaccines "new" in science?</li> <li>Draw a picture of what you think a scientist that studies diseases and vaccines looks like?</li> </ol> </li> <li>On the whiteboard record common answers. Compare students' pictures of "scientists" and discuss similarities and differences.</li> </ul>	
1	Explore	Discuss and assign "History of Vaccines Timeline" activity. Assign groups and discuss group responsibilities. Allow time to begin research	History of Vaccines Timeline Activity Homework: Research topics and copy links into group shared document.
		Organize shared slides into chronological order on Shared Class Timeline. that surprised you after researching completing the timeline with the class.	g and

4	Engage	Science Notebook question: What is the immune system and what do you think it responsible for?
	Explore	Introductory video with questions listed and answered in science notebooks: 1. Define:
	Immune System Innate Immune System Adaptive Immune System Immune Tolerance	
		2. Take notes from video. (transcript may be

	Explain Elaborate	<ul> <li>As a class: Discuss and describe the components of the innate immune system discussed in the video.</li> <li>In Groups of 4: If your immune system were a castle, which parts of the castle would represent the innate immune system? What other types of analogies could you make to the immune system?</li> <li>Discuss Immune System Poster Analogy Project</li> <li>Groups discuss what they would like to compare the immune system to. In middle school they may need a little guidance. Suggestions: Castle, country, island, sports arena</li> </ul>	Immune System Poster Analogy Project
6	Evaluate	Science Notebook Questions: What were the components of the Innate Immune System? Which parts of your groups project represented the components of the innate immune system?	

Explain

Elaborate

7	Evaluate	Science Notebook Questions: What were the primary components of the Innate and Adaptive parts of the Immune System? How did your group choose to represent these components?	Time for groups to finish up with their projects should be given after introductory review questions.
		Class discussion about the components. Work with individual groups to help any misunderstandings.	
	Explain	Groups present their posters and explain their how their components compare to the immune system.	
8	Engage	Science Notebook Questions: Now that you know how the immuhnc0 0C /TT1 [th)2 (e)6.9bthic4 (i)r3 (oup <b>Tk</b> )T	T1 <b>[t.TE</b> 0 Tc 0 Tw <b>[</b> c)4 (oor)3 (t)-2 ( )-10

Explain/Elaborate

		Unit Review Sheet – Science Notebook and Google	
		Side Presentation	
9 -10		Unit Review – as a class	
	Elaborate	Science Notebooks: How has your understanding of vaccines and the immune system changed since the beginning of this unit?	
	Evaluate	Kahoot Review Game	