

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

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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:

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		<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? <u>Louis Pasteur</u>
9	The 1900s	<u>Maurice Hilleman</u> Two other influential scientists and their research
10	The 1900s	<u>Jonas Salk</u> 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

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

	<p>Explain</p> <p>Elaborate</p>	<p>As a class: Discuss and describe the components of the innate immune system discussed in the video.</p> <p>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?</p> <p>Discuss Immune System Poster Analogy Project</p> <p>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</p>	<p>Immune System Poster Analogy Project</p>
<p>6</p>	<p>Evaluate</p>	<p>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?</p>	

Explain

Elaborate

7	Evaluate	<p>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?</p> <p>Class discussion about the components. Work with individual groups to help any misunderstandings.</p> <p>Groups present their posters and explain their how their components compare to the immune system.</p>	Time for groups to finish up with their projects should be given after introductory review questions.

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Engage

Science Notebook Questions: Now that you know how

Explain/Elaborate

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