

Unit 2: Lesson 3 – Discovery and Development of Vaccines

Activity 1: Types of Vaccines

Materials

- Each group will need:
 - The activity sheet for their assigned type of vaccine (inactivated, weakened virus, recombinant, conjugate, or toxoid)
 - Computer with internet access

Procedure

1. Work in small groups.
2. Research the vaccine type chosen by your group or assigned by your teacher and complete the activity sheet for your specific type of vaccine (inactivated, weakened virus, recombinant, conjugate, or toxoid).
3. Create a presentation to share your findings with the class. Use a presentation method as directed by your teacher.
4. When other groups share their presentations, complete the Types of Vaccines Presentation Tables in this packet.

Activity 1: Types of Vaccines Presentation Tables

Inactivated Vaccine	
Describe how this vaccine is made:	
Advantages:	Disadvantages:
Examples of vaccines made this way:	

Weakened Virus Vaccine	
Describe how this vaccine is made:	
Advantages:	Disadvantages:
Examples of vaccines made this way:	

Recombinant Vaccine	
Describe how this vaccine is made:	
Advantages:	Disadvantages:
Examples of vaccines made this way:	

Toxoid Vaccine	
Describe how this vaccine is made:	
Advantages:	Disadvantages:
Examples of vaccines made this way:	

Conjugate Vaccine	
Describe how this vaccine is made:	
Advantages:	Disadvantages:
Examples of vaccines made this way:	

Activity 1: Types of Vaccines

Inactivated Virus Vaccines

1. Watch the clip titled *Polio Vaccine* from the video, “Vaccines and Your Baby”: <https://www.youtube.com/watch?v=ydyzkVVuKkE>.
2. Fill in the blanks based on your understanding of the video clip:
 - a. US President _____ was directly affected by the poliovirus.
 - b. Dr. Jonas Salk made the polio vaccine by first _____ the virus, and then using a chemical to _____ the virus.
 - c. The _____ case of natural polio in the United States occurred in _____.
3. Using your mobile device, download the *Vaccines on the Go: What You Should Know* mobile app and click on “Types of Vaccines”. If you do not have a mobile device, work in a group of students who do or refer to Making Vaccines: How are vaccines made?, Vaccine Education Center at Children’s Hospital of Philadelphia, <http://www.chop.edu/centers-programs/vaccine-education-center/making-vaccines/how-are-vaccines-made>.
4. Conduct additional online research as necessary to complete the following:
 - a. List two benefits of using an inactivated virus to make a vaccine.
 - b. Name one disadvantage of using an inactivated virus to make a vaccine.
 - c. Describe how inactivated virus vaccines are made.
 - d. List two vaccines made using inactivated viruses.

5. Create a presentation that summarizes your research about inactivated virus vaccines. Ensure that your presentation:
 - a. Explains how an inactivated virus vaccine is made.
 - b. Shows how an inactivated virus vaccine works.
 - c. Describes the advantages and disadvantages of inactivated virus vaccines.
 - d. Lists examples of inactivated virus vaccines.

Activity 1: Types of Vaccines

Weakened Virus Vaccines

1. Watch the clip titled *Chickenpox Vaccine* from the video, “Vaccines and Your Baby”: <https://www.youtube.com/watch?v=sDEs8ZB-hsA>.
2. Fill in the blanks based on your understanding of the video clip:
 - a. Over time, the chickenpox virus grown in the laboratory became _____ at growing in children.
 - b. The chickenpox vaccine doesn't cause disease because the virus does not _____, but it does provide _____.
3. Using your mobile device, download the *Vaccines on the Go: What You Should Know* mobile app and click on “Types of Vaccines”. If you do not have a mobile device, work in a group of students who do or refer to Making Vaccines: How are vaccines made?, Vaccine Education Center at Children's Hospital of Philadelphia, <http://www.chop.edu/centers-programs/vaccine-education-center/making-vaccines/how-are-vaccines-made>.
4. Conduct additional online research as necessary to complete the following:
 - a. Name one benefit of the weakened virus approach to making a vaccine.
 - b. Name one disadvantage to using the weakened virus approach to make a vaccine.
 - c. Describe how live, weakened virus vaccines are made.
 - d. List two vaccines made using live, weakened viruses.

5. Create a presentation that summarizes your research about weakened virus vaccines. Ensure that your presentation:
 - a. Explains how a live, weakened virus vaccine is made.
 - b. Shows how a live, weakened virus vaccine works.
 - c. Describes the advantages and disadvantages of live, weakened virus vaccines.
 - d. Lists examples of live, weakened virus vaccines.

Activity 1: Types of Vaccines

Recombinant Vaccines

1. Watch the clip titled *Hepatitis B Vaccine* from the video, “Vaccines and Your Baby”: <https://www.youtube.com/watch?v=xbQui8wLaMg>.
2. Fill in the blanks based on your understanding of the video clip:
 - a. The number of people in the United States infected with Hepatitis B is about_____.
 - b. People infected with Hepatitis B virus may die from_____.
 - c. The Hepatitis B vaccine is made using only the_____ of the virus.
3. Using your mobile device, download the *Vaccines on the Go: What You Should Know* mobile app and click on “Types of Vaccines”. If you do not have a mobile device, work in a group of students who do or refer to Making Vaccines: How are vaccines made?, Vaccine Education Center at Children’s Hospital of Philadelphia, <http://www.chop.edu/centers-programs/vaccine-education-center/making-vaccines/how-are-vaccines-made>.
4. Conduct additional online research as necessary to complete the following:
 - a. List two benefits of using recombinant technology to make a vaccine.
 - b. Describe one disadvantage of using recombinant technology to make a vaccine.
 - c. Describe how recombinant vaccines are made.
 - d. List two vaccines made using recombinant technology.

5. Create a presentation that summarizes your research about recombinant vaccines. Ensure that your presentation:
 - a. Explains how a recombinant vaccine is made.
 - b. Shows how a recombinant vaccine works.
 - c. Describes the advantages and disadvantages of recombinant vaccines.
 - d. Lists examples of recombinant vaccines.

Activity 1: Types of Vaccines

Toxoid Vaccines

1. Watch the clip titled *DTaP Vaccine* from the video, “Vaccines and Your Baby”: <https://www.youtube.com/watch?v=JoocRO4WDHc>.
2. Fill in the blanks based on your understanding of the video clip:
 - a. DTaP is an acronym for which diseases?
 - i. D _____
 - ii. T _____
 - iii. P _____
 - b. To make the DTaP vaccine, the bacterial _____ are purified, then treated with a chemical to make them harmless.
 - c. A _____ that has been made harmless is called a _____.
3. Using your mobile device, download the *Vaccines on the Go: What You Should Know* mobile app and click on “Types of Vaccines”. If you do not have a mobile device, work in a group of students who do or refer to Making Vaccines: How are vaccines made?, Vaccine Education Center at Children’s Hospital of Philadelphia, <http://www.chop.edu/centers-programs/vaccine-education-center/making-vaccines/how-are-vaccines-made>.
4. Conduct additional online research as necessary to complete the following:
 - a. Name a benefit of using just part of a bacteria to make a vaccine.
 - b. Name one disadvantage of using just part of a bacteria to make a vaccine.
 - c. Describe how toxoid vaccines are made.
 - d. List two vaccines made using toxoids.

5. Create a presentation that summarizes your research about toxoid vaccines. Ensure that your presentation:
 - a. Explains how a toxoid vaccine is made.
 - b. Shows how a toxoid vaccine works.
 - c. Describes the advantages and disadvantages of toxoid vaccines.
 - d. Lists examples of toxoid vaccines.

Activity 1: Types of Vaccines

Conjugate Vaccines

1. Watch the clip titled *Pneumococcal Vaccine* from the video, “Vaccines and Your Baby”: <https://www.youtube.com/watch?v=xecFoTYmP7Q>.
2. Fill in the blanks based on your understanding of the video clip:
 - a. A possible effect of _____ is profound deafness.
 - b. The pneumococcal vaccine is made by stripping away a _____ covering the bacteria and attaching it to a _____.
3. Using your mobile device, download the *Vaccines on the Go: What You Should Know* mobile app and click on “Types of Vaccines”. If you do not have a mobile device, work in a group of students who do or refer to Making Vaccines: How are vaccines made?, Vaccine Education Center at Children’s Hospital of Philadelphia, <http://www.chop.edu/centers-programs/vaccine-education-center/making-vaccines/how-are-vaccines-made>.
4. Conduct additional online research as necessary to complete the following:
 - a. Name a benefit of using the outer coating of bacteria to make a vaccine.
 - b. Name one disadvantage of using the outer coating of bacteria to make a vaccine.
 - c. Describe how conjugate vaccines are made.
 - d. List two vaccines made using conjugates.

5. Create a presentation that summarizes your research about conjugate vaccines. Ensure that your presentation:
 - a. Explains how a conjugate vaccine is made.
 - b. Shows how a conjugate vaccine works.
 - c. Describes the advantages and disadvantages of conjugate vaccines.
 - d. Lists examples of conjugate vaccines.