Name Date Period

**NOVA – Making Vaccines**

**Virtual Lab**

***Objective:*** *In today’s lab, you will be performing virtual experiments to help you gain a better understanding of how vaccines are made and used to fight viral infections.*

*Keep in mind, this is a LAB and therefore all answers need to be in COMPLETE SENTENCES.*

# Read through the background information on “[Making Vaccines](http://www.pbs.org/wgbh/nova/bioterror/vaccines.html)” and answer the following questions.

1. Describe the work of physician Edward Jenner in the late 1700’s.
   1. Why is the testing he conducting considered *unethical*?
2. Define ***pathogen***.
3. Generally speaking, how does a vaccine work to create immunity in the body?

# Click on [Making Vaccines Virtual Lab,](https://www.pbs.org/wgbh/nova/bioterror/vacc_nf.html) complete the virtual experiments, and answer the accompanying questions.

1. Look under the “Notes” section that compares Live vs. Non- Live Vaccines. Complete the chart below.

|  |  |
| --- | --- |
| *Live Vaccines* | *Non-Live Vaccines* |
|  |  |

# Click on [“Similar-Pathogen Vaccine: Smallpox Virus”](https://www.pbs.org/wgbh/nova/bioterror/vacc_smallpox.html)

* 1. What similar pathogen is used to create the vaccine for the **smallpox** virus?
  2. Use the space below to draw a series of pictures which outline the process of creating the smallpox vaccine.
  3. The smallpox vaccine is an example of a ( live / non-live ) virus.
  4. How is the smallpox vaccine created *today* different from that created by *Edward Jenner*?

# Click on [“Attenuated Vaccine: Measles”](https://www.pbs.org/wgbh/nova/bioterror/vacc_measles.html)

* 1. What does it mean to create a **live-attenuated vaccine**?
  2. How is temperature relevant to the creation of the measles vaccine?
  3. What other viral diseases are prevented by live-attenuated vaccines?

# Click on [“Killed Vaccine: Polio Virus”](https://www.pbs.org/wgbh/nova/bioterror/vacc_polio.html)

* 1. Summarize the goal in creating a **killed vaccine**.
  2. In the creation of the Polio vaccine, the virus was inactivated by exposing it to .
  3. Why do killed virus vaccines, such as the Polio vaccine, require *booster shots*?
  4. Identify at least two other viruses that are prevented with killed vaccines.

# Click on [“Toxoid Vaccine: Tetanus”](https://www.pbs.org/wgbh/nova/bioterror/vacc_tetanus.html)

* 1. How does a **toxoid vaccine** work to fight infection?
  2. Use the space below to draw a series of pictures which outlines the creation of a toxoid vaccine.

# Click on [“Subunit Vaccine: Hepatitis B”](https://www.pbs.org/wgbh/nova/bioterror/vacc_hepatitis.html)

* 1. How does a **subunit vaccine** work to help prevent infections?
  2. The ( DNA / Protein ) portion of a virus is what makes it *harmful*.
     1. The subunit vaccine only contains the nondangerous ( DNA / Protein ) portion of a virus.

# Click on [“Naked DNA Vaccine: HIV”](https://www.pbs.org/wgbh/nova/bioterror/vacc_hiv.html)

* 1. Identify another name for **Naked DNA Vaccines**.
  2. Summarize the goal of a Naked DNA Vaccine.
  3. What is the role of PCR (Polymerase Chain Reactions) in the creation of this vaccine?
  4. Define ***vector***.
  5. What are the results of the trials being conducted on the HIV vaccine?

1. **Complete Vaccine Flow Chart –** Now that you have researched various forms of vaccines, fill in the flow chart seen below.

***\*\*You must have a description and picture for EACH box.\*\****

