

## WEBQUEST: Viruses and Vaccines

### Part 1: Viruses

Go to the following website: <http://science.howstuffworks.com/virus-human.htm>

1) Name 5 illnesses / diseases caused by viruses.

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\_\_\_\_\_  
\_\_\_\_\_



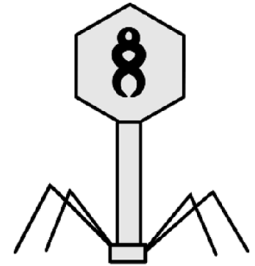
2) What are the symptoms of a cold or the flu? \_\_\_\_\_  
\_\_\_\_\_

At the top right corner, click on NEXT – you should now see “What is a Virus?”

3) How does the size of a virus compare to the size of a bacterial cell?

4) List the three parts of a virus particle (or virion):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



At the bottom, or top right, click on NEXT – you should now see “How Viruses Infect You.”

5) What are three ways a virus might gain entry into your body?

\_\_\_\_\_

6) What are the 5 steps of the **Lytic Cycle** (the viral reproductive cycle)? (see the figure on the left of the webpage)

\_\_\_\_\_  
\_\_\_\_\_

At the bottom, or top right, click on NEXT – you should now see “On the Inside.”

\*\*READ the sequence of events that happens when you come down with a cold or the flu.

\_\_\_\_\_

At the bottom, or top right, click on NEXT – you should now see “Lysogenic Cycle.”

7) Describe how the lysogenic cycle is different from the lytic cycle.

8) What are two viruses that may remain in a host, in the lysogenic cycle, for long periods of time.

\_\_\_\_\_  
\_\_\_\_\_

At the bottom, or top right, click on NEXT – you should now see “Reducing the Spread.”

9) What are four ways that viruses may be transmitted / spread?

\_\_\_\_\_

\_\_\_\_\_



10) What are three things we can all do to help reduce the risk of viral transmission / spreading?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

At the bottom, or top right, click on NEXT – you should now see “Medicines That Can Help.”

11) Do antibiotics have an effect on treating viral diseases? \_\_\_\_\_

12) Why / why not? (your answer to #11) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### HIV Retrovirus Animation

Go to the following website: <http://www.whfreeman.com/catalog/kuby/>

Under “Select a Category”, click on “Animations.”

From the drop down menu, select Chapter 19 to go to the retrovirus animation. Click on the animation (the small picture) to begin.

*View the animation and read the captions. Answer the following questions.*

13) What is a retrovirus? \_\_\_\_\_

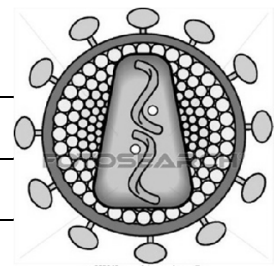
14) What infamous virus belongs to this class? \_\_\_\_\_

15) How does infection begin? \_\_\_\_\_

16) What from the virus goes into the infected cell? \_\_\_\_\_

17) What is the function of **reverse transcriptase**? \_\_\_\_\_

18) Where does the newly produced viral DNA go? \_\_\_\_\_



*The remainder of the animation is detailed. Watch it and read the captions to observe the remainder of the infection cycle.*

19) What eventually happens to the infected cell? \_\_\_\_\_ The viruses? \_\_\_\_\_

## Part 2: Vaccines

Go to the following website: <http://www.pbs.org/wgbh/nova/body/vaccines-calling-shots.html>.

Scroll down the to the bottom of the page to the section with “*RELATED LINKS*”

Click on “Immunity and Vaccines Explained”.

**\*\*Launch the video. (If you do not have sound on your computer, click on “transcript” under the video and read the transcript).**

1) Explain how vaccines work, using the words: virus, immune system, white blood cells, memory cells and vaccine.

**Go back to the main page and under “RELATED LINKS”, click on “Making Vaccines”. Once there, “LAUNCH THE INTERACTIVE.”**



2) Follow the directions to make a **small pox** vaccine.  
What kind of virus was used to make it?

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3) Now follow the steps to make a **measles** vaccine. Read the captions as you work. How did you alter the measles virus so it is not harmful?

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4) Follow the steps to make a **polio** vaccine. Read the captions as you work. How did you kill the polio virus so it is not harmful?

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5) What are three other viruses for which the vaccines used are “killed vaccines”?

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6) Follow the steps to make a **tetanus** vaccine. Read the captions as you work. This is a **toxoid vaccine**. What does that mean? \_\_\_\_\_

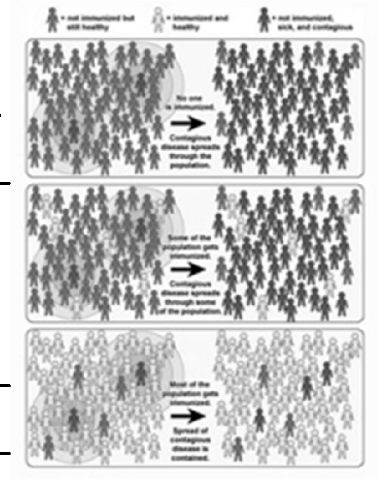
7) Follow the steps to now make a **hepatitis** vaccine. For this vaccine to trigger an immune response, only its protein coat is needed. Read the captions as you work.

What organism did you use to produce this protein coat? \_\_\_\_\_

What is another pathogen for which a subunit vaccine is used? \_\_\_\_\_

**You may now CLOSE (top right) the interactive and click back to return to the main page.**

On the main page, under “RELATED LINKS”, click on “What is Herd Immunity?”.  
 Read this section and answer the questions below.



8) What is herd immunity? \_\_\_\_\_

\_\_\_\_\_

9) What are the two ways people can become immune to an infectious disease?

\_\_\_\_\_ & \_\_\_\_\_

10) What is a disease’s immunity threshold? \_\_\_\_\_

\_\_\_\_\_

11) What is factored in when scientists calculate a disease’s immunity threshold? \_\_\_\_\_

\_\_\_\_\_

12) Why is herd immunity important in our modern day? \_\_\_\_\_

\_\_\_\_\_

Go back to the main page. Under “RELATED LINKS”, click on “What Drives Vaccination Rates?”.  
 Read this section and answer the questions.

13) Which two government organizations oversee the responses to disease outbreaks?

\_\_\_\_\_

14) Who decides which vaccines are required and who can opt out of being vaccinated?

\_\_\_\_\_

15) At the state level, when is proof of up-to-date vaccinations against a defined set of diseases required for children?

\_\_\_\_\_

16) What are the three ways parents can have their children opt out of vaccinations?

\_\_\_\_\_



Click on the graphic “How Hard is it to Get a Vaccine Exemption in Your State?” to enlarge it.  
 (this is the map of the U.S. that is colored blue / green)

17) Where does Oregon fall, in terms of difficulty to obtain a vaccine exemption, according to this map?

\_\_\_\_\_

Scroll down to the section on this page entitled “Why Do Exemptions Matter?” Read this section and answer the question.

18) According to research, why is there a need to minimize vaccination exemptions?

Go back to the main page. Under “RELATED LINKS”, click on “Tracking Disease Outbreaks”. Read and answer the questions.

19) The scientists in charge of tracking and stopping disease outbreaks are called:\_\_\_\_\_.

20) What is meant by the “index case” and how is it used to limit the outbreak of a disease? \_\_\_\_\_

\_\_\_\_\_

Click on the “NOVA Online Interactive” link in the first paragraph, or go to the following link: <http://www.pbs.org/wgbh/nova/body/disease-detective.html>.

Launch the Interactive. Work through the interactive and submit your report

21) What was the source of the outbreak?

\_\_\_\_\_

22) How did you figure out the source? \_\_\_\_\_

\_\_\_\_\_

