



High School Science Virtual Learning

Applied Biological Science

Herd Immunity

April 23, 2020



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Lesson: April 23, 2020

Objective/Learning Target:

Students will be able to understand immunity and how Herd Immunity is beneficial for a community to decrease the chance for pandemics and epidemics.

Let's Get Started:

1. What is the adaptive immune system?
2. What are antigens and antibodies?





Let's Get Started: **Answers**

1. The adaptive immune system is the immune system to responds to pathogens that have been previously introduced to the body.
2. Antigens are foreign substances like bacteria and viruses that are introduced to the body. Antibodies are the defense mechanism to the antigens.



Lesson Activity:

Directions: Watch the video then click on the interactive below and go through the interactive and simulations. Use the information given to answer the practice questions.

Link(s): [What is herd immunity? Video](#)
[Herd Immunity Interactive](#)



Practice

You will use the information from the activity on slide 3 to answer the following questions.

Practice Questions

1. What is herd immunity?
2. How are the few who are susceptible to the disease still protected during herd immunity?
3. What does R_0 represent?
4. What is R_0 affected by?
5. How do epidemic frequencies change as you increase the vaccination rate?

Answer Key

Once you have completed the practice questions check with the work.

1. When a large proportion of a population acquires immunity, the few that are still susceptible to a particular infectious disease (the very old, young, and sick) remain protected.
2. If we vaccinate a large proportion of the population at random, there are likely to be few connected susceptible people.
3. Basic reproductive number, or R_0 ('R naught') which is the average number of cases that the first infected person will produce
4. R_0 is powerfully affected by how easily it spreads, how quickly people recover, and the structure of the contact network.
5. Epidemic Frequencies decrease dramatically as you increase vaccination rates.



More Practice

You will use the information from the activity on slide 3 to answer the following questions.



More Practice:

1. [Herd Immunity Animation](#)
2. [Herd Immunity Simulation](#)



Additional Practice

[Herd Immunity Detailed Modeling](#)