



Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
2019 Volume III: Human Centered Design of Biotechnology

Vaccines, How They Work: From Individual to Population

Guide for Curriculum Unit 19.03.02
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This unit focuses on the blending of vaccine focused content with basic biology content. The blending of content primarily concerns the human immune system. Allowing high school biology students to explore human vaccine technology through fundamental immune system knowledge and providing a tangible and relatable way to engage with these two complex topics to aid student understanding of how a vaccine works on the individual level. Prior to addressing the science behind how a vaccine leverages the immune system some vaccine focused content will provide a brief history of vaccines and explanation of vaccine types. Herd immunity will also be discussed within the unit. Herd immunity refers to the percentage of immune population threshold that is necessary to avoid an epidemic. Herd immunity is about understanding how vaccines work on a population level. It is relevant that students understand that vaccines are not just an individual health issue and are perhaps more importantly a community health issue. These topic areas will also allow the unit to explore the pressing and relevant vaccine related issue of barriers to vaccine adoption and public adoption of vaccine protocols. Finally, the likely future of vaccine technology, DNA vaccines, will be discussed. DNA vaccines offer much promise in eliminating some inherent vaccination issues such as transport, storage, ease of production, and safety.

(Developed for Biology and AP Biology, grade 10; recommended for Biology, grades 9-10)

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