Engineering Antivirals
Connections to Next Generation Science Standards

NGSS Performance Expectation		In this unit, youth:
MS-LS1-1	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	Learn how viruses interact with cells in the human body.
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	Define the criteria by determining the percentage of successful virus attacks their antiviral must decrease.
MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	Work in groups to imagine several ideas and develop a plan for their antiviral that meets the criteria and constraints.
MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	Observe the tests from all groups and use characteristics from different designs to improve their antiviral for a mutant virus.
MS-ETS1-4	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	Test their antivirals against a model cell, identify areas of failure, and decide, based on the results, how to improve their designs.

Connections to NGSS

Crosscutting Concept

Structure and Function

In this unit, youth investigate how the spikes on a virus fit into receptors on a cell. Youth must consider this interaction when engineering antivirals to block the spikes and prevent the model virus from sticking to the model cell.