

High School Lesson Plan

Topic

Messenger RNA Vaccines

Ages

14-18 yo

Learning Objectives

To learn that about messenger RNA vaccines and establish a need for vaccines.

Time

5 min Set-up

10 min Building

5 min Check-in

20 min Total time

Materials

- 1 lime green plastic ball
- 8 foam darts
- 1 white shoe lace - 6 inches
- 1 pink shoe lace - 4 inches

Check-up

Talk with students about what they learned. Ask them the following questions:

- What can you do to boost your immune system?
- What do messenger RNA vaccines contain?

Resources

Vaccine information for Native parents:

www.npaihb.org/Native-Boost



Procedure Cont.

Tell students that today, they will learn about messenger RNA vaccines.

- Share background facts in Appendix A.

Ask students to get in groups of two or ask for two volunteers to come to the front of the class.

- Each group of 2 student we receive a kit and instructions (Appendix B).
- Read the directions while the students follow along.

Step 1: Identify the plastic ball - the body of a virus is like a shell. Let's pretend that this plastic ball is the shell of the virus.



Step 2: Identify the foam darts - Some viruses have spikes. Let's pretend that these foam darts are spikes.



Step 3: Insert the foam darts into the holes in the plastic ball - The spikes stick out of its shell, allowing the virus to stick to your cells and fuse with them.



Step 4: Identify the white shoe lace - The last important part of the virus is the instructions. The instructions tell how to make more copies of itself once it is inside your cells. Then it can spread throughout your body to make you sick. Let's pretend that white shoelace is the instructions for building the shell.



Procedure cont.

Step 5: Identify the pink shoe lace - Let's pretend the pink shoe lace is the instructions for building the spikes.



Step 6: Tie the shoelaces together at one end - The virus carries the instructions inside the shell, so let's tuck the shoelace in.



Now that we have built a virus, let's see how we make a vaccine.

Step 7: Identify the foam darts on the virus - The foam darts are the spikes of the virus. Once your body can recognize the spikes, it can fight back faster if you encounter the virus later.



Step 8: Identify the foam dart and pink shoelace - Messenger RNA vaccines only contain the instructions or the pink shoelace. The vaccine teaches your body to recognize the spikes or the foam darts.



Appendix A

Student Instructions 1 of 2

How do messenger RNA vaccines work? Vaccines are tiny, so let's build a model. We will create a bigger version of what a virus looks like.

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Step 3: Insert the foam darts into the holes in the plastic ball - The spikes stick out of its shell, allowing the virus to stick to your cells and fuse with them.



Step 4: Identify the white shoe lace - The last important part of the virus is the instructions. The instructions tell how to make more copies of itself once it is inside your cells. Then it can spread throughout your body to make you sick. Let's pretend that white shoelace is the instructions for building the shell.



Step 5: Identify the pink shoe lace - Let's pretend the pink shoe lace is the instructions for building the spikes.



Student Instructions 2 of 2

Step 6: Tie the shoelaces together at one end - The virus carries the instructions inside the shell, so let's tuck the shoelace in.



Now that we have built a virus, let's see how we make a vaccine.

Step 7: Identify the foam darts on the virus - The foam darts are the spikes of the virus. Once your body can recognize the spikes, it can fight back faster if you encounter the virus later.



Step 8: Identify the foam dart and pink shoelace - Messenger RNA vaccines only contain the instructions or the pink shoelace. The vaccine teaches your body to recognize the spikes or the foam darts.



After you get a vaccine, your body will learn what the virus spike looks like and build warrior cells or antibodies, which are then on the lookout for the virus. Once your body makes warrior antibodies, it can fight back faster if you encounter the virus later. You are less likely to get sick with the disease; it reduces the seriousness of illness if you get sick, and you are less likely to make others sick.