



Lesson 7: Vaccinations Keep Calm and Get Vaccinated

OBJECTIVES

1. Students will describe how to collect data about influenza using public health surveillance systems.
2. Students will discuss how mathematical modeling (pandemic severity assessment framework) can be used to explain the cause (e.g., viral severity, viral transmissibility) and effect relationships (e.g., pandemic classification, pandemic response) that influence influenza and other pandemics.
3. Students will learn epidemiological terms: disease transmission, data managers, public health surveillance system.

RESOURCES

Read the CDC Science Ambassador Workshop 2014 Lesson Plan: Keep Calm and Get Vaccinated.

<https://www.cdc.gov/careerpaths/scienceambassador/documents/ms-keep-calm-get-vaccinated-2014.pdf>

PREPARATION

1. Email link to have youth watch TED Videos:
 - a. How do vaccines work? <https://www.youtube.com/watch?v=rb7TVW77ZCs>
 - b. Why we need to fight misinformation about vaccines https://www.ted.com/talks/ethan_lindenberger_why_we_need_to_fight_misinformation_about_vaccines?language=en
2. Review, email, and have available to screen share the Look Around! What Do You See? Worksheet <https://ucanr.edu/sites/DiseaseDetectives/files/329187.pdf>
 - a. Ask students to observe human behavior over a 2- to 3-day period
 - b. It's good for you to complete this activity too, so you can contribute and/or keep discussion moving with your own perspective and observations. (It's also quite interesting!)
3. Review and have L7 Vaccines Slide Deck available to screen share.

INSTRUCTIONS

1. Welcome everyone back and check in with the youth. (3 minutes) Slides 1-2

2. Review the group agreements if necessary (2 minutes)

- a. You can either screen share and show the image you took from last week, or you can create a new image using a Google or Powerpoint slide, and display it as your background image.

3. Team Builder: Play Mr. NA activity (10 min) Slides 3-9 (plus link to Mr. Na slides on slide 6)

Read aloud:

"Vaccines teach our body how to fight off invading germs. There are different types of vaccines. An mRNA (or Mr. Na) vaccine uses a replica of a small piece of the germ to train your body with. We get thousands of germs in our body, and our immune system needs to know which ones are bad. So, it is like being in an alien war, and you need to know who is on your side, and who is the enemy. You learn this by recognizing the symbol imprinted on the tail of the enemy alien ship, and how to blast the tail off. This is sort of how an mRNA vaccine works. It teaches you how to identify one small piece and destroy it.

In America, we start giving people their vaccines a few weeks after they are born. Usually, you need to get several doses for it to fully work. Who can name a vaccine that most people have had?

- Diphtheria — 5 doses
- Tetanus — 5+ doses
- Pertussis/Whooping cough (DTaP, DTP, Tdap, or Td) — 5 doses
- Polio (OPV or IPV) — 4 doses
- Hepatitis B — 3 doses
- Measles, — 2 doses
- Mumps, — 2 doses
- Rubella (MMR) — 2 doses
- Varicella (Chickenpox) — 2 doses
- HPV — 2-3 doses
- Flu — every year
- Meningitis — 2 doses

"If we give our bodies vaccines before we encounter the bad germs, we are ready to fight them should they enter the body. This means we can win the fight more quickly and not get as sick.

In this game, we will use pictures of only small pieces of a virus or bacteria, just like an mRNA vaccine. You will try to figure out which vaccine would be needed for each germ."

4. Pull up the Mr. Na Activity Slides.

5. Read through the activity rules together.

6. Show them the demonstration slide.

7. Advance to the "Lab table" and find the match as a group. Copy and paste to the demonstration petri dish slide.



- 8. Split the group into two teams.**
- 9. Send the teams into separate breakout rooms.**
- 10. Paste the links for the slides into the chat, one for each room to work on separately.**
https://docs.google.com/presentation/d/1e8Mlk0K9McJn_98kdkAdpMeHPCUmr9ISL5ZgZ7YfpE/edit?usp=sharing
- 11. Give them five minutes to complete it.**
- 12. Bring them back together.**
- 13. Show the answer slide to the entire group.**
- 14. Discuss the following as a group:**
 - a. What do you remember about getting vaccines from your doctor in the past?
 - b. What do you think is happening inside your body if you feel different after getting the shot? (this means your body is training to fight off these germs when they see them again. So you may feel a little bit like you do when you are actually sick, but you are not really sick, it's just practice.)
 - c. How does getting that little piece of information from an mRNA vaccine help you get ready to fight the germs? (your body can train to search for just that piece on an invader, helping you go to battle quicker and defeat it sooner so you do not get as severely sick for as long).
 - d. How many lives do you think we save in the United States every year because of vaccines? (42,000)¹
- 15. Review the Look Around What Do You See? worksheet (15 min) Slides 11-13**
 - a. Show slide 10.
 - b. Break youth into Zoom breakout rooms for small group discussion with question prompts on slide 11. Copy and paste into the chat box for reference.
 - c. Return participants to the Zoom main room for group report back.
 - d. Show slides 11-13 and discuss.
- 16. Vaccinations (10 min) Slides 14-22**
 - Show slides 14-22. Ask participants question on first slide, solicit answers/assumptions. Click to next slide for official recommendations.



17. Pandemic Severity Assessment Framework (PSAF) (10 min) Slides 23-25

- a. Show slides 23-25.
- b. Review R_0 (R naught).
- c. Introduce Pandemic Severity Assessment Framework (PSAF).
 - i. Discuss Influenza and Coronavirus examples.
 - ii. Ask youth to interpret both graphs in slide 25.
 - iii. Share R_0 information from New York, Santa Clara, Germany (see notes in slide 25) and ask youth how R_0 influences PSAF.

18. Preparation for next lesson (5 min) Slide 26

- a. Introduction to public health education messages, sometimes called Public Service Announcements (PSA) or Social Marketing.
- b. Tell youth to find a meme, video, poster, handout, post or any other educational material related to any disease and answer the questions:
 - i. Who is the audience for this? Age/gender/issue
 - ii. What is the behavior or habit they want people to do?

Reference: 1) Zhou F, Shefer A, Wenger J, Messonnier M, Wang LY, Lopez A, Moore M, Murphy TV, Cortese M, Rodewald L. Economic evaluation of the routine childhood immunization program in the United States, 2009. *Pediatrics*. 2014 Apr;133(4):577-85. doi: 10.1542/peds.2013-0698. Epub 2014 Mar 3. PMID: 24590750.

